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CREASE DROVE, CROWLAND

PHASE II SITE APPRISAL
FOR
PARTNER CONSTRUCTION LTD &
WATERLOO HOUSING GROUP LTD

Project Ref:
P8723

Date:
July, 2019

Prepared for:

Waterloo Housing Group Ltd 1700 Solihull Parkway Birmingham Business Park Solihull B37 7YD	Partner Construction Ltd 19 Mallard Way Derby DE24 8GX
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This report has been prepared in accordance with GRM's Accredited Quality Procedures

If you have any queries regarding this report please contact the project manager in the first instance.

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Site Appraisal for Crease Drove, Crowland

UPDATED SUMMARY OF PHASE II RECOMMENDATIONS

Where further assessment is required it is indicated with a "Y" in the right hand column.		
Proposed Development	Residential properties with associated gardens, soft landscaping, infrastructure and a balancing pond.	
CONTAMINATION ASSESSMENT - REMEDIATION / WASTE DISPOSAL		
End Users	None at current ground levels. Clean capping layer including an anti-dig layer, may be required should contamination be brought closer to the surface.	Y
Site Workers	Asbestos removal within existing buildings by a suitably licenced contractor prior to demolition works. Ground workers to be made aware of hazards associated with asbestos containing materials and hydrocarbon impacted material and adopt safe working practices during development.	
Construction Materials	Appropriate concrete specification. PE water supply pipes should be suitable for majority of properties. Upgraded water supply pipes within clean backfill required for current commercial area (to be confirmed by water authority) or source removal or treatment of TPH impacted soil.	Y
Groundwater	Source removal or treatment of impacted soil and detailed quantitative groundwater risk assessment, if required.	Y
Surface Water	No remediation required.	
Waste Disposal	Preliminary Waste Classification: Non-Hazardous for topsoil and made ground. Hazardous for hydrocarbon impacted natural soils. Inert for natural strata. Will need to be confirmed by receiving landfill.	Y
GEOTECHNICAL ASSESSMENT – FOUNDATIONS		
Ground Treatment Required	Temporary drainage for standing water and site surface drainage to prevent runoff, temporary haul roads and working platforms for piling. Potential ground improvement and/or earthworks for Peat depending on proposed levels.	Y
Main Bearing Strata	Granular deposits in Abbey Sand and Gravel. Oxford Clay for piles.	
Nett Allowable Bearing Pressure	110kN/m ² (Abbey Sand and Gravel) for traditional spread foundation. To be confirmed by a specialist for piles.	
Rockhead	Rock strength material has not been encountered at shallow depth.	
Tree Influence	Some around site boundaries. Extent to be confirmed by a tree survey.	Y
Volume Change Potential	Medium for Peat and cohesive Abbey Sand and Gravel.	
Likely Foundation Types	60% Strip/Trench Fill plots, 20% Strip/Trench Fill (depends on clients preference) 20% Pile (depends on depth of hydrocarbon remediation). Some dewatering and dig and pour techniques needed for traditional foundations.	Y
Likely Foundation Depth Range	1.0m begl minimum, 1.8m begl maximum depths; average depth 1.1m begl for traditional spread foundations taken through clay in the Abbey Sand and Gravel and 1.5m for traditional spread foundations taken through Peat. To be confirmed by piling contractor for piles, estimate 10m long.	Y
Excavation Hazards	Shallow groundwater and low strength, potentially collapsible materials at shallow depth. Side support and/or reduced level working platforms needed to all excavations.	
Floor Slab Types	60-80% beam and block. 20-40% voided cast in-situ.	
Gas Protection Requirements Radon and/or Landfill	Gas protection measures to CS2 required. Radon protection not required.	
GEOTECHNICAL ASSESSMENT - GENERAL		
Slope Stability Risk/Settlement	Low at present profile. Potential for settlement of Peat and soft clay where ground levels increased.	Y
Soakaways Potential	Not suitable.	
New Access Roads	Observational and laboratory CBRs 2-5% in granular soils and less than 2% in cohesive soils (Abbey Sand and Gravel). <2% for Peat and made ground.	Y

Buried Concrete Class	DS-2, AC-2 for made ground below former central warehouse if left in-situ. DS-1, AC-1 for superficial deposits and remaining made ground. GEN-1, RC35, above groundwater. DS-2, AC-2, for concrete in contact with groundwater. DS-4, AC-3s for Oxford Clay.	
Retaining Walls and Boundary Features	None existing or proposed.	
Further Assessment Targets	Hydrocarbon source removal or treatment followed by validation. Gas Protection Measures Design and Verification Plan. Detailed Quantitative Risk Assessment for groundwater and possible liaison with Environment Agency if hydrocarbon impacted soils stay in-situ. Flood risk assessment. Pile mat design.	Y
Other Comments	Possible earthworks for flood mitigation measures and settlement analysis in Peat.	Y

This summary is based on the full report that provides the detailed assessment of the ground risks affecting the development and how to manage them. It should not be used in isolation.



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1 INTRODUCTION

1.1 PREAMBLE

GRM Development Solutions Limited (GRM) has been appointed by Partner Construction Ltd and Waterloo Housing Group Ltd to undertake a Phase II Site Appraisal Report targeting the previously identified hazards.

A desk study, initial intrusive ground investigation and a program of gas monitoring have previously been undertaken by GRM, reported under the following references:-

- Phase I Site Appraisal (Desk Study), Report Ref: GRM/P8723/DS.1, Dated December, 2018.
- Phase II Site Appraisal Report, Ref: GRM/P8723/F.1, Dated January, 2019.
- Gas Addendum Letter, Ref: P8723\PEL\GAL, Dated March 2019.

These initial studies identified a number of potential hazards which may impact the proposed development that required further investigation. These included:

- Hydrocarbon contamination in the southwestern part of the site.
- pH impacted material below the service yard.
- Unknown material below the footprint of the existing warehouses.
- Low strength Peat strata across the southern part of the site.
- Shallow groundwater and unstable ground.

Further to the above the Client has been made aware by the Local Authority that remediation of a former chemical works, located some 115m to the east, is currently being undertaken, specifically relating to volatile organic compound (VOC) contamination in soils. As such it has been proposed that baseline measurements for a range of commonly occurring contaminants and specifically VOC's are taken in the groundwater below the subject site.

This document is intended to provide information that will assist decision making by identifying and recommending solutions to ground engineering and contamination issues. Relevant information from the aforementioned reports has been included within this report.

GRM Standard Limitations of Reporting are provided in Appendix A of this report.

The Client proposes to develop the site with residential properties with associated gardens, soft landscaping, infrastructure and a balancing pond. The outline development proposals provided by the Client are presented in Appendix B.

1.2 OBJECTIVES OF THE SITE APPRAISAL

The principal aims of this Phase II Site Appraisal are as follows:

- a) Obtain any relevant further information, from easily accessible sources, about the soil and groundwater conditions within the area of the site.
- b) Confirm extent of previously identified ground-related geotechnical and contamination hazards within the site boundaries that affect the proposed development.
- c) Provide development recommendations.
- d) Provide advice on any further works required for the cost-effective reduction of risks to the development and procedures likely to satisfy regulators.

Whilst every effort has been made to pre-empt the likely requirements of the Local Authority and the Environment Agency, they are likely to have specific requirements that will need to be discussed and addressed at a later date.



2 PHASE II CONCEPTUAL SITE MODEL

HUMAN HEALTH			
Source	Pathway	Receptor	Remedial Solution
Locally elevated levels of hydrocarbons (WS06).	Indoor and outdoor inhalation of soil dust, the ingestion of, and dermal contact with, contaminated soil and soil dust, ingestion of vegetables that have taken up contamination and contaminated soil attached to vegetables.	End users.	Delineation of source. Removal of drainage tank. Removal and/or treatment of contaminated soil.
	Groundwater.	Construction and maintenance workers.	
Made ground, Peat.	Inhalation of carbon dioxide.	End users.	Gas protective measures required. To be confirmed following completion of the gas monitoring.
Potential asbestos containing materials associated with buildings.	Inhalation of asbestos fibres.	Construction workers.	Survey and controlled removal by a specialist contractor.
Locally elevated levels of hydrocarbons in Peat (WS06).	Migration of contamination through leaks and joints, degradation of water pipe materials.	End users.	PE water supply pipes and clean backfill required (to be confirmed by water supply company following delineation and validation of source removal or treatment).
CONTROLLED WATERS			
Locally elevated levels of hydrocarbons in Peat and groundwater (WS06).	Leaching of contaminants and vertical migration to the groundwater.	Secondary Aquifer – Undifferentiated Layers.	Delineation of source. Removal of drainage tank. Removal and/or treatment of contaminated soil.

3 PHASE II GROUND INVESTIGATION

3.1 FIELDWORK

The ground investigation has been designed in accordance with the general comments outlined in Appendix A (iv).

The additional ground investigation fieldwork was conducted between the 3rd and 5th June 2019, with a groundwater monitoring and sampling visit undertaken on the 18th June 2019. A total of twenty-two exploratory holes (ten windowless sample boreholes, four hand-held window sample boreholes, two cable percussion boreholes, four trial trenches and two trial pits) were progressed, to depths ranging between 0.60m and 15.0m below existing ground level (begl). The exploratory hole location plan and exploratory hole logs are presented in Appendix C and Appendix D respectively.

LIST OF TARGETED EXPLORATORY HOLES	
Exploratory Hole	Reason for Location and Type
WS101 to WS110 and HH102	Delineation of the TPH impacted soils in the southwestern area and additional sampling below the service yard (HH102).
HH101, HH103 and HH104	Sampling below the footprint of the existing buildings.
TT101 to TT104	Targeted investigation of the boundary between Peat and Abbey Sand and Gravel.
TP101 and TP102	Locations to provide additional cover across the site.
TT101 to TT104, and TP101 and TP102	Visual assessment of shallow material stability.
BH101 and BH102	Deep boreholes for the design of piles.
WS109, BH101 and BH102	Additional standpipes for ground gas and groundwater monitoring and groundwater sampling as required.
WS = window sample borehole, HH = hand-held window sample borehole, TT = trial trench, TP = trial pit and BH = cable percussion borehole.	

The exploratory holes were positioned in locations across the site with reference to existing and proposed site features and the anticipated ground conditions.

The ground levels reported on the logs were interpolated from the Client supplied topographical survey drawing No. 17149ea-01, dated 17 February, 2016.

Three further gas and groundwater monitoring standpipes were installed during the site works, the rationale for these are discussed fully in Section 6. A Gas Monitoring Plan, illustrating the locations of the standpipes, is presented in Appendix E.

It should be noted that during the groundwater sampling visit on the 18th June 2019 borehole WS02 was inaccessible due to water logging in this area of the site following a long period of heavy rain.

3.2 PROVEN GROUND

The following ground conditions were encountered during the investigation fieldwork (Includes findings from December 2018 and June 2019):

- Topsoil
- Made Ground
- Peat (Superficial geology)
- Abbey Sand and Gravel (Superficial geology)
- Oxford Clay (Solid geology)

3.2.1 Topsoil

Topsoil was encountered across the eastern third of the site (WS01 to WS03 and TT103 and TT104) to depths of between 0.3m and 0.6m, and generally to 0.4m begl.

The material typically comprising dark brown slightly sandy gravelly silty clay with localised brick and slate fragments in WS01, and rootlets and occasional roots generally noted to the full depth of the topsoil profiles.

3.2.2 Made Ground

Made ground was encountered in all the exploratory locations across the remaining two thirds of the site to depths of between 0.25m (WS106) and 1.6m (BH101), and generally to 0.6m, with the depth unproven in two locations (WS102 and WS108) at 4.0m begl.

Exploratory holes WS101 to WS110 and HH102, located in the southwestern part of the site for the purpose of delineating the hydrocarbon impacted area located around WS06 and providing additional sampling below the service yard (HH102), encountered made ground to a depth of between 0.25m and 0.8m begl, with the depth of the made ground in WS102 and WS108 being unproven at 4m begl.

WS06, WS101, WS102, WS109 and WS110

- Boreholes WS06, WS101, WS102, WS109 and WS110 were located in areas of soft landscaping along the southern boundary, where service hatches indicated the location of below ground drainage tanks.
- These encountered made ground to depths of 0.85m, 0.6m, >4.0m, 0.8m and 0.3m begl respectively, generally as vegetation over dark/light brown slightly sandy slightly gravelly to gravelly silty clay, with fragments of brick, concrete and asphalt to between 0.2m and 0.85m begl.
- Overlain in WS06 by loose to medium dense gravelly sand to 0.3m begl over slightly sandy cobbly gravel to 0.5m begl, and underlain in WS101 to 0.6m begl by medium dense yellow brown slightly gravelly, slightly clayey sand and underlain in WS102 to 1.0m begl by stiff grey mottled red slightly sandy gravelly clay with a moderate cobble content including fragments of brick and concrete.

- Poor sample recovery was made below 1.0m in WS102 to the full depth of the location at 4.0m begl, possibly due to cobble size materials being present from shallow depth. However where recovery was made this included loose grey mottled red slightly sandy gravelly cobbles of brick and concrete to 2.8m, very soft dark grey stained black slightly sandy slightly gravelly silty clay with hydrocarbon odours and surface sheen between 2.8m and 3.0m and black stained cobbles of brick to the full depth of the borehole.
- Though poor recovery was made in WS102 the findings were not inconsistent with those of WS06 and continue to suggest that a soakaway/underground drainage tanks are present in this location. These are possibly the source of the hydrocarbon contamination.

WS105 and WS106

- Exploratory holes WS105 and WS106 were located in the concrete access drive along the southern site boundary. These encountered a 0.3m and 0.25m thick grey concrete hardstanding.

WS07, WS103, WS104, WS107, WS108 and HH102

- Exploratory locations WS07, WS103, WS104, WS107, WS108 and HH102 were undertaken in the yard to the front of the existing warehouses and encountered a hardstanding comprising of 0.04m to 0.15m asphalt/tarmac over in all locations, apart from WS07, grey concrete to a depth of between 0.25m and 0.4m begl.
- The hardstanding was underlain in WS103, WS104, WS107 and HH102 to 0.6m, 0.6m, 0.7m and 0.5m begl respectively by sub-base comprising loose slightly clayey slightly sandy gravel of limestone with a low cobble content of limestone and in WS07 to 0.6m begl by medium dense, gravelly sand with a 50mm band of sandstone.
- Poor sample recovery was made below 0.3m in WS108 to the full depth of the location at 4.0m begl due to a cobble being pushed down the borehole. Where recovery was made below 3.0m the material was described as firm light brown sandy clay. The sample liners taken between depths of 1-2m and 3-4m were also noted as being stained black.
- Strong hydrocarbon odours were recorded in the made ground from WS104 only.

Exploratory holes HH101, HH103 and HH104 were located below the floor slab in the existing warehouses to provide sampling locations in these previously inaccessible areas.

- These encountered a 0.3m thick concrete hardstanding over sub-base of buff slightly clayey slightly gravelly sand or sandy gravel of limestone with a moderate cobble content of limestone (sub-base) to 0.6m begl.
- HH104 encountered a 0.1m thick solid layer of brick below the limestone from 0.6m begl.
- HH101 was terminated at 0.6m begl on a hard layer and thus the full thickness of the made ground was not confirmed in this location.

The remaining exploratory holes which encountered made ground, WS04, HD05, TP101, TP102, TT101, TT102, BH101 and BH102, were located to the east or north of the current commercial area and encountered made ground to a depth of between 0.3m and 1.6m, and generally to 0.7m begl.

- This material typically comprised dark brown slightly sandy slightly gravelly to gravelly silty clay with gravels comprising varying proportions of quartzite, mudstone and chalk and fragments of brick, concrete, ceramics and metal.
- Cobbles of brick and concrete were recorded within the made ground to a depth of 0.7m begl at the southern end of TT102.
- Poorly compacted cobbly gravel (brick fill) to a depth of 0.4m begl was encountered in WS04 and gravelly sandy clay to a depth of 0.15m begl in HD05, likely associated with former warehouse located in the centre of the site.

3.2.3 Peat

Peat deposits were encountered in the majority of the exploratory locations across the site, apart from WS102 and WS108 where poor sample recovery prevented the soil profile from being fully determined, HH101 which was terminated on dense sub-base material below the floor slab and HD05, TP101, TP102, TT101-N, TT102-N, and WS04 where the stratum was absent.

Where the Peat was present it was observed to be directly below the topsoil or made ground and was encountered to proven depths of between 0.55m (WS03) and 2.8m begl (WS01). The stratum thickness typically increased towards the southwest and southeast corners of the site, with WS107, WS109, WS06 and WS01 recording the Peat to depths of between 2.0m and 2.8m and conversely WS02, WS03, WS07 and TT101-S recording the Peat to depths of between 0.55m and 1.0m begl. Based on the exploratory hole locations undertaken an approximate limit for the Peat is shown on the illustrative foundation zone plan provided in Appendix O.

The Peat typically comprised soft to firm and occasionally very soft and stiff, grey-brown, dark brown, and grey, occasionally stained black, slightly sandy clay, slightly gravelly organic clay and locally silty clay, with occasional decomposed fibrous plant material and organic odours.

A bed of saturated, loose to medium dense clayey sand was encountered in WS01 between 2.1m and 2.5m begl, WS105 between 1.0m and 1.1m, WS107 between 1.6m and 1.8m, HH104 between 1.2 and 1.8m and the basal layer of the stratum was observed to be sandier or with 5cm sand lenses in WS106 below 1.4m and TT104 below 1.5m.

A thin (0.15m to 0.25m) layer possibly representative of Peat was also encountered beneath the topsoil in WS02 and WS03 to maximum depths of 0.75m and 0.55m begl, respectively.

Possible made ground comprising firm to stiff, grey and dark grey, slightly sandy clay was encountered beneath the made ground in WS06 between 0.5m and 0.85m begl and firm brown slightly sandy gravelly clay was recorded as fill by the drilling team below the made ground in BH101 between 0.6m and 1.6m begl. Although the origin of these materials was not clearly defined, it was comparable to the Peat encountered in previous exploratory boreholes and may represent reworked material.

Natural organic odours, hydrocarbon odours and discolouration of soils were observed in the Peat in several locations which are detailed in Section 3.3.

Standard Penetration Test N-values undertaken throughout the depth of the stratum, including the possible made ground in WS06 and BH101, at depths of between 1m and 2m begl, ranged from 1 (WS01 at 1m begl) to 10 (BH101 at 1.2m begl), and were generally in the order of 6.

Based on empirical relationship formulated by Stroud (1974) where undrained shear strength is related to SPT N-values and a factor based on plasticity, these values are indicative of very low to low strength, and locally extremely low strength soils.

3.2.4 Abbey Sand and Gravel

Abbey Sand and Gravel deposits were encountered below the Peat or made ground in each of the exploratory holes, apart from WS102, WS108 and HH101 as previously explained, to proven depths of between 1.6m (WS110) and 3.2m begl (BH102) and unproven at depths up to 3.45m begl (WS01 and WS02).

The base of these deposits was unproven in WS01, WS02, WS07, HD05, WS103, WS106, WS107, WS109, HH102-HH104, TP101, TP102, TT103 and TT104.

These deposits generally comprised:

- An occasional upper bed of soft to stiff slightly sandy to sandy slightly gravelly to gravelly clay to depths of between 0.7m (TT101) and 1.5m (WS104), typically in locations where the Peat was depleted or absent, apart from in WS101 where the clay bed was present below the Peat for the full thickness of the stratum, 1.8m to 2.7m begl.
- The clay deposit was encountered in WS101 (1.8-2.7m), TP101 (0.3-1.2m), TP102 (0.5-0.8m), TT101 (0.5-0.7m), HD05 (>0.25m), WS02 (0.75-1.3m), WS03 (0.55-1.0m), WS04 (1.0-1.5m).
- A majority of loose to medium dense, slightly clayey sandy gravel with occasional bands of gravelly sand, generally increasing in gravel and decreasing in clay content with depth to the full depth of the stratum where proven.
- The granular deposit was encountered for the full thickness of the stratum in WS103, WS104, WS105, WS106, WS107-WS110, HH102 to HH104, BH101, BH102, WS01, TT102, TT103, TT104, WS06, WS07, and below a clay bed in TP101 (1.2-1.8m), TP102 (0.8->1.9m), TT101 (0.7-1.9/2.1), WS02 (1.3->3.45m), WS03 (1.0-2.95m), WS04 (1.5-2.6m).
- The granular material included an occasional upper bed of loose to medium dense occasionally slightly gravelly to gravelly silty sand to a depth of between 0.75m (TT102-N) and >2.5m begl (WS106).

- The sand bed was encountered in WS104 (1.6-1.8m), WS106 (1.6->2.5m), TT102-N (0.6-0.75m), TT103 (1.5-1.6m) and WS04 (0.5-1.0m).

Standard Penetration Test N-values undertaken at depths of 1m to 1.2m begl, ranged from 15 to 33, at a depth of 2m begl, ranged from 5 to 20 (one value >50) and at 3.0m begl, ranged from 9 to 15, indicating loose to medium dense and locally very dense conditions.

3.2.5 Glacial Till

Superficial material consistent with Glacial Till was locally encountered in WS06, TP101 and BH101 underlying the Abbey Sand and Gravel from depths of between 1.8m to 2.6m begl to a depth proven in WS06 and BH101 of 3.0m and 4.0m respectively.

The stratum typically comprised:

- Stiff, approximately medium strength, slightly gravelly clay. The gravel was observed to comprise chalk and rare flint.

3.2.6 Oxford Clay

This stratum was encountered below the Abbey Sand and Gravel in WS101, WS104, WS105, WS110, TP101, BH101 TT101-N, TT102, BH102, WS03, WS04 and WS06 from depths ranging between 1.6m (WS110) and 3.2m begl (BH102) to a depth of greater than 15m begl. The full thickness of the formation was unproven.

The stratum typically comprised:

- Stiff becoming very stiff, firm to stiff at the top of the stratum, dark grey clay with occasional limestone, chalk and mudstone gravels at the top.
- An approximately 0.2m thick weathering zone was encountered from 2.6m to 2.8m begl in WS04 where rare disseminated selenite crystals were noted.
- Although pyrite was not observed, the unweathered material is anticipated to contain such minerals.

Standard Penetration Test N-values undertaken at a depth of 3m begl, ranged between 12 and 29 and at 4m begl, ranged between 13 and 20, beyond which N-values increased with depth, suggesting medium to high strength to some 5m to 6.5m begl and very high strength to the maximum depth of the investigation at 15m begl.

3.3 CONTAMINATION OBSERVATIONS

The following visual and olfactory evidence of potential contamination was encountered during the fieldwork along with the groundwater strike data.

Current commercial area					
Location	Depth (m)	Strata	Observations and laboratory results	GW Depth (m)	Observations
WS06	0.85-2.0	Clay in Peat.	Strong hydrocarbon odour becoming faint from 1.5m, stained black.	1.5	Wet material.
WS101	0.6-1.8	Clay in Peat.	Black staining and organic odour.	1.4	Wet material.
WS102	2.8-3.0	Clay in Peat.	Strong hydrocarbon odour and sheen, stained black.	2.8-3.0 Wet material.	
	3.0-4.0	Possible Made Ground.	Stained black.		
WS103	1.2-1.8	Sand in Peat.	Hydrocarbon odour and sheen.	1.8	Wet material.
WS104	0.45	Made Ground.	Strong hydrocarbon odour and sheen.		
	1.6-1.8	Sand in Abbey Sand & Gravel.	Hydrocarbon odour and sheen.	1.6	Wet material.
WS105	1.1-1.8	Abbey Sand & Gravel.	Slight hydrocarbon odours.	1.1	Wet material.
WS107	1.6-1.8	Sand in Peat.	Hydrocarbon odour and sheen.	1.6-1.7	Wet material.
WS108	0.3-2.0	Poor recovery.	Liners stained black.	0.3	
	3.0-4.0			3.0	
WS109	1.2-2.6	Clay in Peat.	Hydrocarbon odour and sheen, pockets stained black.		
	2.6-3.0	Abbey Sand & Gravel.	Hydrocarbon odour and sheen.	2.6	Wet material.
HH103	0.6-1.4	Clay in Peat.	Stained black, no odours.		Wet material.
HH104	0.7-1.2	Clay in Peat.	Natural organic odours, stained black.		
	1.2-1.8	Sand in Peat.	Strong hydrocarbon odour and sheen.	0.95	Wet material.
Area occupied by former central warehouse and remaining green space					
Location	Depth (m)	Strata	Observations and laboratory results	GW Depth (m)	Observations
TT103	0.55-1.5	Clay in Peat.	Natural organic odours, stained black.		
TT104	0.5-1.7	Clay in Peat.	Natural organic odours, stained black.		

The fieldwork identified a natural organic odour associated with the cohesive Peat across the site where the materials were not visually impacted by hydrocarbons; therefore the Peat is considered a potential source of ground gases.

Visual and olfactory hydrocarbon contamination was identified during the initial and supplementary fieldwork within the south west corner of the site, at depths between 1.1m and 1.8m begl associated with the Peat.

Black staining was observed within the Peat located to the east of the site within TT103 and TT104, however no hydrocarbon odour was noted within these materials that it is considered likely to be associated with natural organic staining within the Peat.

A plan showing the visual/olfactory contamination identified on-site is presented in Appendix F.

3.4 GROUNDWATER OBSERVATIONS

Groundwater was encountered in the made ground and superficial deposits from depths of between 0.3m and 2.6m begl, with the exception of BH102 which encountered seepage in the Oxford Clay at 4.2m rising to 4.1m in a 20 minute period. The groundwater observations are tabulated above and were generally encountered as follows:

- In the sub-base material below the service yard (WS07, HH101 to HH104) at depths of between 0.3m to 0.6m begl.
- In the Peat typically associated with the sand beds (WS101 to WS103, WS105 to WS107, HH104, TT103 and WS01) at depths of between 0.95m and 1.8m begl.
- In the granular deposits of the Abbey Sand and Gravel, generally held below the clay in the Peat or the upper bed of clay in the Abbey Sand and Gravel (WS104, WS106, WS109, WS110, HH102, HH104, TP101, TP102, TT101 to TT104, BH101 and WS02 to WS04) at depths of between 0.75m (TT102-N) and 2.6m (WS109) begl.

Findings for boreholes WS102 and WS108 are not considered reliable due to poor sample recovery following encounters with cobble size concrete and brick at shallow depth.

Perched groundwater is present within the shallow made ground soils and is not considered to be representative of the groundwater beneath the site.

The groundwater table is shown to be confined to the more granular layers within the Peat and underlying Abbey Sand and Gravel, given the variability of the granular horizons a groundwater flow direction has not been determined based upon the strike and monitoring data.

However, the Abbey Sand and Gravel is designated as a Secondary A Aquifer and provides base flow to the River Welland recorded 600m to the north which flows in an easterly direction to the estuary (approximately 35km east). Therefore it is considered that the regional groundwater flow is to the north and north east.

4 LABORATORY ANALYSES RATIONALE

4.1 CHEMICAL LABORATORY ANALYSIS

The choice of contamination testing undertaken during this phase of the investigation was based on the initial Phase II assessment, identified past uses of the site, adjacent risk from former chemical works to the east and site observations, and comprised:

- Three samples of made ground and three samples of Peat were analysed for a general suite of contaminants including asbestos and TPHCWG (Validation suite).
- Three samples of Peat, one of Abbey Sand and Gravel and one of made ground were analysed for banded aliphatic and aromatic hydrocarbons (TPHCWG).
- Three samples of Peat, one of Abbey Sand and Gravel and one of Oxford Clay were analysed for total TPH to provide further data where hydrocarbon odours have been noted.
- One sample of Abbey Sand and Gravel was analysed for organic matter.
- Four samples of groundwater were tested for GRM water suite with low level phenol and VOC.
- Two samples of groundwater from taken from the southwest corner were tested for banded aliphatic and aromatic hydrocarbons (TPHCWG).

The chemical analysis results are presented in Appendix G.

Samples not used for testing will be stored for a month after issue of this report and then disposed of, unless the Client requests in writing that they be kept.

4.2 GEOTECHNICAL LABORATORY TESTING

Geotechnical soils testing undertaken as part of this phase of ground investigation includes the following:

- Four samples (one sample of the Peat, two samples of clay in the Abbey Sand and Gravel, and one sample of the Oxford Clay) underwent Atterberg Limits (PI) classification.
- Three samples (one sample of the Peat, one sample of clay in the Abbey Sand and Gravel and one sample of gravel in the Abbey Sand and Gravel) underwent a CBR test at natural moisture content.
- Eight samples of the Oxford Clay underwent quick undrained triaxial testing.
- Three samples of the Oxford Clay underwent SD1 testing for concrete in pyritic ground.

Geotechnical tests were selected to provide the parameters necessary for the budgetary design of the development including foundations and infrastructure. The geotechnical test results are presented in Appendix H and Appendix G (pH and sulphate results) and summarised in Section 10.2.

5 QUANTITATIVE RISK ASSESSMENT – HUMAN HEALTH (SOIL)

5.1 INTRODUCTION

The Client proposes to develop the site with residential properties with associated gardens, soft landscaping, infrastructure and a balancing pond.

Potential and confirmed sources of contamination have been put forward in the initial phase II ground investigation at the site, summarised in the initial Phase II conceptual model given in Section 2. These include:

- The potential presence of asbestos in the make-up of the existing buildings.
- Hydrocarbon contamination in the southwestern part of the site.
- pH impacted material below the yard impacting the waste category for this material.
- Unknown material below the footprint of the existing warehouses.

Representative samples of all strata and those considered to be potentially contaminated by virtue of the findings from the initial phase II investigation and based on site observations during this current phase of investigation were collected for further examination and potential testing.

The rationale for the end use specific *Tier 1 Acceptance Criteria (TAC)* used by GRM is outlined in Appendix A (vi) and for this site the chemical analysis results are being compared against the TAC for residential end use with plant uptake. In order to adopt a conservative approach a Soil Organic Matter (SOM) content 1% has been used for the made ground, Peat and Abbey Sand and Gravel, as this reflects the lowest SOM recorded in each of the materials tested, apart from the topsoil samples where an SOM of 6% is suitable.

To provide an initial assessment, benzo(a)pyrene has been used as a surrogate marker compound for genotoxic PAHs with exception of naphthalene. A copy of the thresholds used in this assessment is presented in Appendix I.

5.2 RISK TO END USERS

The chemical analysis results are presented in Appendix G.

Whilst the number of samples tested is considered sufficient to characterise the made grounds, topsoil and TPH impacted natural strata it is not considered appropriate to carry out statistical analysis on this data set. Therefore the results have been compared directly against the TAC.

All the laboratory analyses from both phases of the investigation have been considered in the assessment below.

5.2.1 Analysis of Soil Contamination Data

GRM General Suite – Topsoil

The values for all the contaminants tested in the topsoil were below the relevant 'Critical Concentrations' (i.e. TAC) for residential with plant uptake end use.

GRM General Suite – Made Ground

The values for all the contaminants tested in the made ground were below the relevant 'Critical Concentrations' (i.e. TAC) for residential with plant uptake end use.

It should be noted that an elevated pH value of 12.2 was locally recorded in WS07 at 0.3m begl which is not considered to be a risk to human health particularly as this material is likely to be removed for the development.

Petroleum Hydrocarbons

Soil samples were taken from the ten window sample holes (WS101 to WS110) positioned around WS06 where visual and olfactory evidence of potential petroleum hydrocarbon contamination was observed to provide information on the lateral and vertical extent of the contamination.

Further samples were taken in the made ground below the yard, HH102, in the made ground below the existing warehouse units, HH101 and HH104, and in the Peat from HH103 and HH104, after visual and olfactory evidence of similar TPH contamination was observed in HH104. HH104 being close to a further tank anecdotally indicated to be present to the northeast of the existing warehouses. Overgrown vegetation in this area has not made it possible to locate service hatches to confirm the tank location.

Total hydrocarbon concentrations ranged from 19mg/kg (WS110) to 2,800mg/kg (WS06) at locations where visual and olfactory hydrocarbon contamination was identified.

Representative samples were analysed for TPHCWG testing and compared against the GRM TACs for the individual bands and the exceedances have been summarised in the table below;

Contaminant	Concentration Range (mg/kg)	GRM TAC (mg/kg)	Location (depth m begl)
Aliphatic >C ₅ -C ₆	<0.003 – 0.14	42	-
Aliphatic >C ₆ -C ₈	<0.003 – 2.3	100	-
Aliphatic >C ₈ -C ₁₀	<0.003 – 18	27	-
Aliphatic >C ₁₀ -C ₁₂	<10 – 200	130	WS109 (1.5-1.6)
Aliphatic >C ₁₂ -C ₁₆	<10 – 720	1,100	-
Aliphatic >C ₁₆ -C ₂₁	<10 – 790	65,000	-
Aliphatic >C ₂₁ -C ₃₅	<10 – 180		-
Aromatic >C ₅ -C ₇	<0.003	70	-
Aromatic >C ₇ -C ₈	<0.003	130	-
Aromatic >C ₈ -C ₁₀	<0.003	34	-
Aromatic >C ₁₀ -C ₁₂	<10 – 93	74	WS109 (1.5-1.6)
Aromatic >C ₁₂ -C ₁₆	<10 – 470	140	WS06 (0.9) & WS109 (1.5-1.6)
Aromatic >C ₁₆ -C ₂₁	<10 – 490	260	WS06 (0.9) & WS109 (1.5-1.6)
Aromatic >C ₂₁ -C ₃₅	<10 – 140	1,100	-

The results have shown that hydrocarbon contamination is present within the south west area of the site, associated with the current commercial area, (WS06 and WS109) at concentrations considered to pose a risk to end users. However, given the depth at which it is present >0.9m begl, the risk posed to end-users is considered to be low, where site levels remain unchanged.

Should site levels be lowered or contaminated soils brought nearer to the surface then remediation of the hydrocarbon impacted soils will be required to protect end-users.

No elevated concentrations of contaminants were recorded within the area of current soft landscaping.

A plan showing the locations of soil contamination is presented in Appendix J.

Asbestos – Made Ground

The screening for asbestos on samples from the various made grounds across the site, including two samples from within the footprint of the existing structures, HH101 and HH104, two from the service yard, WS07 and HH102, one within the footprint of the former structure in the centre of the site, HD05, and one from the made ground associated with the tanks in the southwestern corner, WS06, did not reveal the presence of such contamination in these samples.

Pesticides

The screening for pesticides did not reveal the presence of such contamination in the samples analysed.

5.2.2 Water Supply Pipes

It is considered that, based on the UKWIR guidance, the concentrations of contaminants recorded to date are such that for the areas of soft landscaping, across the central and eastern areas of the site PE water supply pipes should be suitable.

However, within the area of hydrocarbon contamination within the south west area, remedial measures to protect underground pipes may be required. This may take the form of an alternative pipe material and/or backfilling of service trenches with clean inert material.

It is recommended that consultation with the relevant water supply company is undertaken to assess whether upgraded water supply pipes are required.

5.2.3 Summary of Risk to End Users

The risk to end users from soil contamination is considered to be low and no remedial work is required, based upon current site levels.

However, localised remedial work may be required with respect to the hydrocarbon-impacted soils (WS06) should site levels be lowered and contamination is brought closer to the surface.

5.3 RISK TO SITE WORKERS

Potential asbestos containing material has been noted to be present within the structures present at the site. It is assumed that the demolition will be undertaken by a suitably licensed asbestos removal contractor, which will mitigate the risk to construction and maintenance workers.

Appropriate personal protective equipment should be used during the TPH source removal in the southwest of the site.

The general comments outlined in Appendix A (vii) should be considered when site specific risk assessments are completed.

6 QUANTITATIVE RISK ASSESSMENT – HUMAN HEALTH (GROUND GAS)

The gas risk assessment methodology used by GRM is outlined in Appendix A (v).

As the proposed land use is classed as high (residential with gardens); five 35mm gas/water monitoring standpipes have previously been installed across the site (WS01 to WS04 and WS06). The response zones have been targeted at the natural strata.

A further three 35mm gas/water monitoring standpipes have been installed during this phase of the investigation (WS109, BH101 and BH102) also targeting the natural strata.

Based on BS8576:2013 *Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds*, the gas hazard was considered low (natural soil with low organic content (up to 5%) and hydrocarbon impacted soils, and so the monitoring programme comprised six visits over three months. The findings of which have been reported in a separate gas addendum letter issued following the completion of the full monitoring program.

A further round of gas monitoring was undertaken during this current phase of investigation, the results of which are presented in Appendix K. It should be noted that it was not possible to monitor borehole WS102 at this time.

The gas monitoring has been undertaken using an LMSxi Multifunction Gas Analyser and Photo-Ionisation Detector (PID).

The results of the most recent gas monitoring were consistent with the previous findings.

Gas precautions are required and reference should be made to Gas Addendum Letter, Ref: P8723\PEL\GAL, Dated March 2019 for details.

The desk study risk assessment determined that no radon protection measures are required.

6.1 SUMMARY OF RISK FROM GAS

The investigation has revealed a specific risk to end users from ground gas and gas protection measures will be required.

6.2 SUMMARY OF RISK FROM HYDROCARBON VAPOURS

Based upon the vapour monitoring completed, very low concentrations of hydrocarbon vapours has been detected with results ranging from 0.00ppm to 0.6ppm. Therefore it is considered that the risk posed to end-users from hydrocarbon vapours is very low and no remedial work specifically for these is considered necessary.

7 QUANTITATIVE RISK ASSESSMENT - CONTROLLED WATERS

The methodology, rationale and guidance GRM have used to assess the risk to controlled waters are set out in Appendix A (viii).

The primary receptors for this site have been identified as the underlying Secondary A Aquifer (Abbey Sand and Gravel) and the River Welland (600m north). The primary pathways are infiltration (aquifer) and lateral migration (River Welland).

The majority of the made ground across the current commercial area is not regarded as a significant source of contamination due to its limited thickness and as it does not exhibit any obvious signs of contamination. However we have done some groundwater testing for general contaminants to confirm this.

The hydrocarbon impacted natural soils below the current commercial area have been identified as a potential source of contamination to controlled waters and, accordingly, groundwater testing has been conducted to determine whether it poses a risk. The results of the groundwater analysis are provided in Appendix G.

7.1 INTERPRETATION OF GROUNDWATER OBSERVATIONS AND MONITORING

During the site works groundwater strikes were encountered in the made ground and superficial deposits from depths of between 0.3m and 2.6m begl, with the exception of BH102 which encountered seepage in the Oxford Clay Formation at 4.2m rising to 4.1m in a 20 minute period.

The groundwater has been monitored on seven occasions between 20th December 2018 and 18th June 2019.

The monitoring results have been summarised in the table below;

Location	GW depth range (m begl)	GW depth range (m AOD)	Response Zone
WS01	1.03 – 1.10	0.40 – 0.33	Peat
WS02	0.75 – 0.89	0.73 – 0.59	Abbey Sand and Gravel
WS03	0.49 – 0.68	1.05 – 0.86	Abbey Sand and Gravel
WS04	0.00 – 0.39	1.62 – 1.23	Abbey Sand and Gravel
WS06	0.75 – 1.10	1.64 – 1.29	Peat
WS109	0.62	1.52	Peat
BH101	0.74	0.95	Oxford Clay
BH102	1.12	0.51	Peat

Based upon the monitoring data, the groundwater levels within both the Peat and Abbey Sand and Gravel are found to be similar in depths across the site, therefore it is likely to be the same groundwater body and in hydraulic continuity.

Given the variability of the granular horizons present in both the Peat and the Abbey Sand and Gravel a groundwater flow direction is not readily apparent from the dataset. However, it is considered that the Abbey Sand and Gravel (Secondary A Aquifer) is providing base flow to the River Welland, therefore it is considered that the groundwater flow direction is to the north and north east towards the River Welland.

7.2 ASSESSMENT OF THE CHEMICAL ANALYSIS RESULTS

Groundwater samples have been obtained on two occasions; 5th December 2018 from WS06 only and 18th June 2019 from WS01, WS03, WS04, WS06 and WS109.

Initially the water from WS06 was scheduled for TPHCWG, benzene, toluene, ethylbenzene and xylene (BTEX) and methyl tert-butyl ether (MTBE). The second set of waters was tested for a general suite of contaminants including metals, polycyclic aromatic hydrocarbons (PAHs) and TPHCWG.

The site does not lie within a Groundwater Source Protection Zone and there are no potable water abstractions within 2km of the site. Given the sensitivity of the underlying Secondary A Aquifer (Abbey Sand and Gravel) and the possibility that it is providing base flow to the River Welland, the results have been compared against Environmental Quality Standards (EQS). However, where an EQS is not available for a particular contaminant the results have been compared against UK Drinking Water Standard (UK DWS).

It should be noted that the UK DWS for TPH has now been revoked, however in the absence of an alternative standard a TPH of 10µg/l is often adopted as a conservative threshold value. The World Health Organisation (WHO) also provides guidance values for TPHCWG fractions in drinking water.

The results have been summarised in the table below;

Contaminant	Concentration Range (µg/l)	EQS (unless stated otherwise) (µg/l)	Location
Arsenic	<3 – 7	50	-
Iron	<10 – 8,900	1,000	WS06 (2 nd round)
Nickel	<3 – 39	4	WS01 & WS06 (2 nd round)
Benzo(a)pyrene	<0.01 – 0.02	0.00017	WS03 & WS06 (2 nd round)
PAHs	<0.01 – 0.02	0.1	-
Naphthalene	<0.01 – 0.07	2	-
Aliphatic >C ₁₀ -C ₁₂	<5 – 105	300 *	WS06 (1 st round)
Aliphatic >C ₁₂ -C ₁₆	<10 – 1,380	300 *	WS06 (1 st round)
Aliphatic >C ₁₆ -C ₂₁	<10 – 2,800		WS06 (1 st round)
Aliphatic >C ₂₁ -C ₃₅	<15 – 596		WS06 (1 st round)
Aliphatic >C ₈ -C ₁₀	<0.1 – 0.62	300 *	-
Aliphatic >C ₁₀ -C ₁₂	<5 – 44.1	90 *	-
Aliphatic >C ₁₂ -C ₁₆	<10 – 652	90 *	WS06 (1 st round)
Aliphatic >C ₁₆ -C ₂₁	<10 – 1,720	90 *	WS06 (1 st round)
Aliphatic >C ₂₁ -C ₃₅	<15 – 428	90 *	WS06 (1 st & 2 nd rounds)
Total TPH	<30 – 7,700	10 ^	WS06 (1 st & 2 nd rounds)
Dichloromethane	21 – 23.6	20	WS01, WS03, WS04 and WS06 (2 nd round)
1,1-Dichloropropene	<6 – 20.8	-	WS06 (2 nd round)

* WHO threshold

^ UK DWS

Metals

Iron and nickel have both been found to be above the EQS values within the groundwater in WS01, WS03 and WS06 during the second round of monitoring. The highest concentrations are from WS06 located within the south west corner. It is considered that iron and nickel may be present as a result of the breakdown of the organic Peat at these locations as a significant source was not identified within the associated soils.

PAHs

Benzo(a)pyrene was also recorded marginally above the laboratory limit of detection in WS03 and WS06 and where it has been recorded the concentrations are above the EQS value. It is considered that the benzo(a)pyrene may be associated with the impacted soils within WS06 and migration has occurred to be detected in WS03 to the east.

BTEX and MTBE

The results for BTEX Speciated and MTBE analysed in WS06 during the first round, were below the limit of detection for the analysis.

Hydrocarbons (TPHCWG)

The result for total TPH, 7700µg/l, in WS06 within the south west corner was notably above the former threshold for UK drinking water of 10µg/l, with the aliphatic and aromatic fractions for C12 to C35 above the WHO guidance.

It is considered that the hydrocarbon-impacted soil within the Peat is proven to be impacting upon the underlying groundwater. However, no TPH was detected within WS109 within the vicinity. Therefore the potential mobility of the hydrocarbons within the groundwater may be limited.

In addition to this, WHO rank the overall mobility for these fractions from moderate (Aromatic >EC12-EC16) to very low (Aromatic >EC21-EC35), with most of these fractions being of low to very low mobility.

Therefore the impact upon controlled waters is considered to be localised and limited remediation is considered to be required within the area of WS06.

Volatile Organic Compounds (VOCs)

During the second round of groundwater testing four samples were analysed for a suite of VOCs with respect to the off-site remediation for VOCs at the former chemical works, located some 115m to the east of the site. A copy of the Remediation Implementation Plan, dated 7th November 2018 (Reference Q-05843-C-RIP_Issue 2), and Environmental Agency response, dated 29th March 2019, has been obtained by GRM from the Local Authority planning portal for reference purposes.

The groundwater results recorded Dichloromethane in each sample analysed and 1,1-Dichloropropane in WS06 only above the laboratory limit of detection.

In comparison with EQS, Dichloromethane was recorded marginally above threshold. No EQS or UKDWS is available for 1,1-Dichloropropene.

The Remediation Implementation Plan was prepared for the proposed remediation for a former chemical works to the east of the subject site with the intention to render the former chemical works suitable for redevelopment for residential end use and to address long-term off site liabilities for the current site owner.

Groundwater levels below the chemical works ranged from 1.0m to 2.5m bgl and the flow direction was considered to be complex with a flow generally to the northeast but with at least a proportion of flow towards the west, in the direction of the subject site.

Site-specific Assessment Criteria (SSAC) were derived for the remedial works for a limited range of VOCs including Dichloromethane at 117µg/l. The results on-site have been compared with the SSAC and are not found to be elevated.

Therefore it is considered that the Dichloromethane detected is likely to be due to the off-site former chemical works. However, as the off-site is currently undergoing remedial work and the concentrations present are not significantly elevated above either the EQS or the SSAC the risk posed to controlled waters beneath the site is very low and no further work is considered necessary.

A threshold value is not currently available for 1,1-Dichloropropene, however, limited research summarised that this is mainly used in farming as a compound in pesticides. Given the elevated concentration is located in the south west corner (WS06) and agricultural fields border the southern boundary it is considered to be associated with an off-site source.

A plan showing the locations of groundwater contamination is presented in Appendix L.

7.3 SUMMARY OF RISK TO CONTROLLED WATERS

The Abbey Sand and Gravel and River Welland are considered to be most sensitive receptors. The chemical results have shown that hydrocarbon-impacted Peat is a potential source of contamination to controlled water receptors and remedial work is considered necessary.

The risk posed to controlled waters from off-site VOC sources is considered to be very low and no further work is required.

8 PHASE II CONCEPTUAL SITE MODEL

HUMAN HEALTH			
Source	Pathway	Receptor	Remedial Solution
Hydrocarbon-impacted Peat soils (WS06).	Indoor and outdoor inhalation of soil dust, the ingestion of, and dermal contact with, contaminated soil and soil dust, ingestion of vegetables that have taken up contamination and contaminated soil attached to vegetables.	End users.	No remediation is required, based upon current ground levels.
		Construction and maintenance workers.	
Made ground, Peat.	Inhalation of carbon dioxide.	End users.	Gas protective measures required, suitable for Characteristic Situation 2.
Hydrocarbon-impacted Peat soils (WS06). Off-site migration of VOCs.	Inhalation of hydrocarbon / VOC vapours.	End users.	No remediation is required.
Potential asbestos containing materials associated with buildings.	Inhalation of asbestos fibres.	Construction workers.	Survey and controlled removal by a specialist contractor.
Hydrocarbon-impacted Peat soils. Off-site migration of VOCs.	Migration of contamination through leaks and joints, degradation of water pipe materials.	End users.	Locally, upgraded water supply pipes (to be confirmed by water supply company following validation of source removal or treatment). Elsewhere standard PE water supply pipes should be suitable.
CONTROLLED WATERS			
Hydrocarbon-impacted Peat soils (WS06).	Leaching of contaminants and vertical migration to the groundwater from soils.	Secondary A Aquifer. River Welland (600m N).	Removal of drainage tank. Removal and/or treatment of contaminated soil within the vicinity of WS06. Boundary treatment to prevent further off-site migration.
Off-site migration of VOCs.			No remediation required.

9 REMEDIATION

The recommended remedial measures detailed below should be considered as preliminary and used to determine budget estimate costs for the remediation of the site.

9.1 RECOMMENDED REMEDIAL MEASURES AND VALIDATION REQUIREMENTS

9.1.1 Protection of End Users

Based upon the recorded levels of contamination soil remediation is not required for the protection of end users, based upon current ground levels.

The risk to end users may be increased in the event that site levels being reduced which will result the contaminated soils being brought closer to the surface and localised remedial work will be required.

Remedial measures may include source removal and a clean capping layer within gardens and soft landscaping areas within the vicinity of the hydrocarbon-impacted soils. It is recommended that an anti-dig layer is incorporated into the clean capping layer.

The existing topsoil across the eastern third of the site (WS01 to WS03) has been shown be uncontaminated and can be used as a topsoil in a clean capping layer or as a growth medium in private gardens and soft landscaping. If there is insufficient topsoil to complete the proposed development, then some will need to be imported.

Any materials imported for use to construct the soil capping layer will require chemical validation to confirm that they are suitable for use. Samples of these materials will need to be analysed for a suite of contaminants including metals, inorganics, speciated PAHs and other contaminants such as, speciated hydrocarbons and asbestos depending on the source. The number of samples that require analysis will depend on the source of the materials. Typically an analysis rate of one sample per two gardens and one sample per four gardens (minimum of three samples per source and material type) applies for generated and virgin soils respectively.

The thickness of a soil capping layer will also need verifying by way of hand dug pits in each plot.

Any topsoil/subsoil strip will need to be undertaken when the material is dry. The stripped material will need to be stockpiled and stored in accordance with the Defra Code of Practice *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*, BS8332:2015 and BS8601:2013. The topsoil / subsoil will need to be placed within garden areas in accordance with the methods outlined in the aforementioned documents, taking care not to compact them whilst doing so. Should soils become compacted as part of the building process then allowance should be made for the soils to be loosened and thereby promote aeration and drainage, which will reduce water-logging and subsequent aftercare costs.

Should any further material suspected of being significantly contaminated be encountered during the redevelopment of the site, GRM can be contacted to undertake additional investigation if necessary. The local Environmental Health Officer should be contacted and informed of any additional remedial work required.

Ground Gas

Gas protection measures are required for the proposed development. No vapours protection measures are required for the proposed development.

The gas protection measures are to comprise the provision of a gas resistant membrane (such as Monarflex Reflex Super, Juta GP1 or similar), fully sealed at joints and service penetrations, and beam and block floor slabs. These would provide a score of 4.5 points under BS8545 and so will be suitable for the type of building proposed (Type A).

9.1.2 Protection of Site Workers

The risk to site workers from the identified soil contamination is low. Although locally elevated carbon dioxide has been identified, no remedial measures are required.

However the use of suitable PPE and adoption of appropriate working protocols should be enforced during the ground works stage of construction and suitable precautions should be taken during the removal of any asbestos containing materials and hydrocarbon contaminated soils.

9.1.3 Protection of Controlled Waters

The risk to controlled waters is moderate and remedial work is considered necessary. Although there is no direct link between the hydrocarbon impacted soil and the below ground warehouse waste storage tanks to the north and south it is likely that the tanks will be removed and therefore tank removal and any grossly contaminated soils and validation would be appropriate at this time.

With regards to the hydrocarbon hotspot, several remedial options have been considered below;

Excavation and Disposal of Impacted Materials

Excavation and removal of impacted materials centred on WS06 to the full depth of the impacted materials (2m begl) and disposal of the contaminated arisings. Based upon the contaminant profile it is considered likely the soils will be classified as 'hazardous' waste.

Once the initial excavations are complete, the sides and base of them will need to be sampled to determine whether the source of contamination has been removed. The samples taken will need to be subject to analysis for the contaminants of concern (i.e. hydrocarbons). Should further contamination be detected from the validation testing, the excavation will require extension and re-validating.

Once the void has been confirmed to be clean (i.e. validation samples meet the remedial criteria), then the excavation can be backfilled with imported chemically and geotechnically suitable materials.

This option allows for the removal of all significantly impacted soil over shorter time scales however this does incur significant disposal and import costs.

Ex-situ Bioremediation

Excavation of impacted materials centred on WS06 to the full depth of the impacted materials (2m begl), the arisings are then placed in 0.5m high linear stockpiles (windrows). The soil is then mixed with sand or clay to lower the organic content of the Peat and bacteria is then added to promote breakdown of the hydrocarbons present. The 'windrows' are then turned over on a regular basis and the concentrations of hydrocarbons are monitored until the concentrations meet a site specific remedial target to protect controlled waters.

This process will need to be carried out by a Remediation Contractor and is effective in the breakdown and remediation of hydrocarbon-impacted soils, however consideration needs to be given to longer treatment timescales and considerable space on-site to allow for treatment. Dependent upon the volume of material being treated an Environmental Permit will need to be obtained.

If excavated material is retained on site then it will require covering with a clean capping layer.

Ex-situ Stabilisation or Solidification

This remedial method involves the excavation of the impacted soils (WS06) and blending with a binding agent to prevent the mobilisation of hydrocarbons into the groundwater. This will also improve the geotechnical properties of the soils and as such consideration will need to be given to the placement of the treated soils to not impact upon the proposed foundation solution.

The process will need to be carried out by a Remediation Contractor and is the timescales may fit within the build programme. However, a bench trial may be required to determine whether the hydrocarbon-impacted soils may respond to treatment and potential leachate generation of the treated soils.

For all options a Remediation Strategy will need to be prepared and a Controlled Waters Detailed Quantitative Risk Assessment (DQRA) will be required to derive site-specific remedial targets.

An illustrative Remediation Plan is presented in Appendix M.

9.1.4 Protection of Water Pipes

It is considered that, based on the UKWIR guidance, the concentrations of contaminants recorded to date are such that PE water supply pipes would be suitable for the majority of the site, however within the current commercial area, the hydrocarbon contamination identified would require pipes to be upgraded to Barrier Type A. However, following source removal of the hydrocarbon contamination it is recommended that the local water supply company for the site be contacted to confirm the use of PE water supply pipe across the entire site.

9.2 REMEDIATION METHOD STATEMENT

A Remediation Strategy and a Gas Protection Measures Design and Verification Plan are required at this stage.

A controlled waters DQRA to establish site specific remedial targets / validation screening levels will be required.

Following your review of this document, we would recommend that a copy of it be forwarded to the Local Authority for comment and approval, prior to commencing development of the site. The Local Authority may choose to include other consultees as part of the planning process (such as the Environment Agency).

Consultation should be undertaken at the earliest possible opportunity to avoid abortive or delayed works.

9.3 DISPOSAL AND CLASSIFICATION

Based on the Waste Classification Report (Appendix N), together with a WAC suite of analysis it is considered that the natural strata impacted with hydrocarbons (WS06 at 0.9m and WS109 at 1.5) will be classed as Hazardous Waste.

Shallow made ground in one location from the service yard (WS07 at 0.3m begl) was also classified as Hazardous Waste in the Waste Classification Report due to elevated pH (12.2). However further testing of samples from the same made ground including a WAC site (HH102) and pH determinations for similar material below the adjacent buildings (HH101, and HH104) indicated pH values of between 7.8 and 8.6, suggesting the elevated pH is likely to be an anomaly.

Therefore the made ground across the site is considered suitable for disposal as Non-Hazardous Waste.

Hydrocarbon contaminated soils from across the current commercial area should be segregated and disposed of as Hazardous Waste.

The unaffected natural strata underlying the site is likely to be classified as Inert for disposal purposes, however, further testing will be required to confirm this.

Early consultation with the relevant landfill sites over their particular acceptance criteria may produce cost savings. Reference should be made to the relevant notes in Appendix A (x).

Care should be taken to keep clean natural arisings separate from the made ground and free from construction materials, as natural soils mixed with made ground and construction materials may attract additional disposal costs.

Although not identified during the site works, visible asbestos containing materials (ACMs) within soils will result in the soils being classified as Hazardous Waste. Visible ACMs should be removed, employing appropriate health and safety protocols and where possible should be undertaken prior to disposal.

It is recommended that any materials to be exported are stockpiled and tested to confirm disposal rates, as this may be more cost effective than using the results contained within this report.



10 GEOTECHNICAL ASSESSMENT

10.1 INTRODUCTION

The Client proposes to develop the site with residential properties with associated gardens, soft landscaping, infrastructure and a balancing pond. Finished floor levels and the levels of any underground engineering works have not been provided.

In addition to the site specific comments below reference should be made to the general comments relating to the Geotechnical Assessment listed in Appendix A (xi to xvi).

10.2 GEOTECHNICAL TESTING

Geotechnical testing has been carried out both on site and in the laboratory; the results of this testing are provided on the logs in Appendix C, and in Appendix H. These results are summarised in the tables below:

In situ Testing:

Test Parameter	Range of Results (m begl)		
	Peat	Abbey Sand and Gravel	Oxford Clay
SPT 'N' values	1 to 10 at 1m 6 at 2m	15 to 33 at 1m 11 to 20, >50 at 2m in WS07 9 to 15 at 3m	12 to 29 at 3m 13 to 20 at 4m

Laboratory Testing:

Test Parameter	Range of Results		
	Peat	Abbey Sand and Gravel	Oxford Clay
Natural Moisture Content	22 to 47%	15 to 21%	22 to 23%
Plasticity Index	24 to 37% (medium volume change potential)	17 to 25% (low to medium volume change potential)	27 to 34% (medium volume change potential)
Shear strength			83kPa (BH101 at 4m) to 195kPa (BH102 at 14.5m) Stiff to very stiff consistency and high to very high strength

10.3 ENGINEERING GROUND TREATMENT

Though the near surface soils were generally firm under foot during the initial intrusive investigation, localised standing water and wet ground conditions were recorded in the centre of the site during the walkover in November 2018 and a large area in the eastern part was water logged during the groundwater monitoring visit in June 2019. Due to this localised standing water and prevalence of Peat in the southeast of the site, it is recommended that temporary haul roads are allowed for until the main roads are constructed.

A working platform will be required for any piling plant in areas underlain by Peat. It is recommended that the design of the working platform is carried out as soon as possible. The working platform certificate requires signing by the Principal Contractor for the site. An allowance for this, and responsibility for the design of the platform (estimated at 800mm thick if constructed without reinforcement), should be made in tender packages and site programmes.

Earthworks may be required depending on the need for flood risk mitigation measures. It should be noted that raising site levels on the Peat will create settlement that will need to be allowed for in infrastructure design.

Allowance should also be made for temporary site surface water drainage to prevent run off from the site to local drains.

Dependent on proposed levels, some earthworks or ground improvement may be necessary to mitigate settlement of the soft Peat deposits.

10.4 EXCAVATION CONDITIONS

Excavation of the materials encountered during the ground investigation should be easily achieved using conventional hydraulic excavation techniques. A breaker or similar plant is likely to be required where hard standing or existing foundations are encountered, including those observed in the former warehouse footprint.

From the ground investigation undertaken, excavations in the granular beds of the Peat and the Abbey Sand and Gravel would be **liable to collapse** without warning and this situation is likely to be exacerbated by water ingress.

Side wall collapse was noted in the Abbey Sand and Gravel from 0.7m begl in TT101-S and from 1.6m in TT103. Further fast groundwater ingress was noted in TP102 at 1.2m, in TT101-S at 1.8m and TT103-S at 1.6m begl, and moderate groundwater ingress noted in TT103 at 2.1m and TT104 at 2.2m begl.

The observed groundwater conditions suggest that the use of full dewatering systems (e.g. well pointing) may be necessary to dewater excavations.

Dewatering, with associated treatment and disposal of contaminated water will be needed for the TPH 'hotspot'.

Care should be taken to ensure that dewatering does not lead to settlement of soils below existing structures or services on or off-site.

10.5 EXISTING STRUCTURES / SUBSTRUCTURES

There are existing structures on the site including warehouses, underground tanks, old foundations or other buried structures (associated with the demolished warehouse), and localised underground services in the west of the site.

10.6 FOUNDATIONS

The topsoil, untreated made ground, Peat and upper bed of variable consistency clay in the Abbey Sand and Gravel are considered unsuitable as bearing strata and all new foundations encountering these materials should be carried down through them to found on the more competent and consistent granular medium dense (or denser), Abbey Sand and Gravel.

Peat was encountered in the southeast and southwest of the site to depths of 0.55m (WS03) to 2.8m (WS01) begl and the upper bed of low strength clay in the Abbey Sand and Gravel was typically encountered across the remainder of the site to depths of between 0.7m (TT101) and 1.5m (WS04). The approximate extent of the Peat stratum is given on the illustrative Foundation Zone Plan presented in Appendix O.

There are trees along and within the site boundaries and any new foundations within the zone of influence of these trees will need to be deepened in line with guidance in NHBC Chapter 4.2. However, it is recommended to take all traditional foundations through the cohesive layer to the top of the granular Abbey Sand and Gravel deposits.

Based on the ground conditions a minimum foundation depth of 1m begl and a practical maximum depth for excavation taken through the Peat of 1.5m to 1.8m begl is recommended, restricted by high groundwater and excavation instability.

For plots that are likely to encounter depths of Peat in excess of 1.8m or are located over existing below ground tanks and hydrocarbon impacted soil which require removal or treatment it is recommended that consideration be given to a piled foundation.

Based on established depths of Peat and clay in the Abbey Sand and Gravel across the site and the extent of the area impacted by hydrocarbon contamination, together with the most recent proposed development layout it is estimated that approximately 60% of the proposed plots will be suitable for trench foundations.

A further 20% of plots will be suitable for traditional foundations or piles depending on the client's preference. For these plots where traditional foundations are to be adopted an allowance would need to be made for a reduced level dig, dewatering and use of a dig and pour operation which may result in piling being a more practical alternative.

At this stage it is estimated that trenchfill foundation depths of between 1m and 1.8m begl might be expected.

It is envisaged that the supporting strata and foundation depth range will be as follows:

	Friction piles supported in the Oxford Clay.	Strip/trench fill foundations	
		Deepened through Peat to depths of between 1.0m and 1.8m, generally 1.5m.	Deepened through clay in the Abbey Sand and Gravel to depths of between 1.0m and 1.5m, generally 1.1m.
Plot No.	01-07, 20-21	12-19, 22-26, 36-39, 40-42, 45	08-11, 27-35, 43-44, 46-50

Plots 08, 09, 12, 13 and 36 to 46 may require piles depending on the depth of the hydrocarbon remediation and depth of disturbed ground following tank removal.

TRENCHFILL

The Abbey Sand and Gravel encountered in the anticipated foundation depths, was generally medium dense for the granular material. It is anticipated that a nett allowable bearing pressure of at least 110kN/m² should be available for conventional strip or trench fill footings. This will allow line loads up to 50kN/m to be taken on footings 450mm wide and 65kN/m on footings 600mm wide. This should result in total settlements of not more than 20mm, keeping differential settlements within acceptable limits.

Heave precautions will be required where the foundations lie within the heave zone of trees as defined in NHBC Standards Chapter 4.2 and cohesive strata are present. Foundations should be remote from the direct action of tree roots, and should not be constructed so close to trees as to significantly damage their root systems.

Wider footings may be required for higher point/line loads such as at party walls etc. Should wider footings be required for higher point/line loads, GRM should be contacted for further advice.

An allowance for dewatering and the use of dig and pour techniques is recommended to mitigate against excavation instability and groundwater ingress. Excavations should not be left open as they will suffer from water ingress, overbreak and additional concrete usage.

PILES

Areas underlain by significant thicknesses of Peat and areas of deep disturbance following tank removal and remediation of hydrocarbon impacted soil are not considered likely to be suitable for the use of traditional strip foundations.

It is further considered that it would be impractical to excavate through the natural Peat beyond 1.5m to 1.8m due to the presence of groundwater from these depths and excavation instability, therefore it is anticipated that a minimum of 20% of the site is likely to be piled, with a further 20% piled depending on the clients preference.

A piling specialist will need to be approached to provide pile dimensions and safe pile capacities that should be provided with the cable percussion boreholes to provide information for a detailed design. Consideration should be given to nearby structures and infrastructure and achieving sufficient penetration to resist heave when choosing the appropriate pile type. Due to the presence of poor near surface bearing strata the piles should be progressed into the Oxford Clay. Due to the high groundwater and saturated granular soils, allowance for temporary casing would be prudent.

Until confirmed otherwise allow for the use of 10m long piles.

Whilst piled foundations would end bear beneath the influence of trees, the piles and ring beams should be designed to resist potential heave from tree influence and down-drag from settlement in the Peat.

A testing regime and objectives of the works will need agreeing with regulatory and warranting bodies prior to works. The pile design will need to be justified to the warranting bodies and the justification should be included within the piling contract.

10.7 FLOOR SLABS

Due to the localised influence of trees, presence of extremely low to low strength Peat and requirement for gas protection measures, it is recommended that for proposed structures supported on traditional foundations an allowance be made for voided beam and block floors.

For piled structures a voided cast in-situ floor slab utilising the circa 800mm piling mat would be beneficial.

10.8 BURIED CONCRETE

Based on the recorded water soluble sulphate and pH levels in the topsoil, superficial deposits and made ground at the site, in accordance with the requirements of BRE Special Digest 1 (2005), 'Concrete in Aggressive Ground', the buried concrete at the site should be assumed as DS-2, AC-2 for made ground below the former central warehouse and DS-1, AC-1 for the remaining made ground, topsoil and superficial deposits.

Sulphate concentrations in the groundwater were between 580mg/l (WS04) and 1200mg/l (WS01), therefore where buried concrete is likely to be in contact with the groundwater the design sulphate class should be increased to DS-2 and AC-2.

Should buried concrete encounter the Oxford Clay a worse case Design Sulphate Class for buried concrete should be assumed as DS-4 and the ACEC Class as AC-3s.

The results of the water soluble sulphate and pH testing are presented in Appendix G.

10.9 SLOPE STABILITY AND RETAINING STRUCTURES

The site and surrounding area is flat, therefore, there is no significant risk of slope instability occurring on the site at present gradients.

Earthworks and re-grading of the site may be a requirement as part of any flood risk mitigation measures. Future ground profiles may require earth retaining structures, for which further advice may be required when more information is available.

It should be noted that raising levels over Peat will cause settlement, the extent of which will need to be assessed. Infrastructure protection and possible earthworks and/or ground improvement is likely required to mitigate against this.

10.10 SOAKAWAY DRAINAGE

The clay Peat strata are not considered to have a suitable infiltration rate for use in soakaways. Whilst the Abbey Sand and Gravel potentially has a suitable infiltration rate, the presence of shallow groundwater precludes its use in soakaways. An alternate drainage solution is recommended.

A balancing pond is proposed. The level of the pond in relation to the groundwater should be considered to determine if the pond requires lining and designing to resist floatation.

10.11 NEW ACCESS ROADS AND EARTHWORKS

Site observations suggest that cohesive and granular soils on the site will have CBR values of less than 2%, and 2% to 5%, respectively, and less than 2% for the Peat and made ground, when suitably drained. Proof rolling and the improvement of soft spots may result in increased CBR values and the incorporation of a geotextile grid into sub-base layers may allow for reduced capping thickness.

Laboratory test results were consistent with the site observations, with CBR values on shallow samples from the cohesive Abbey Sand and Gravel of 1% and 1.6%, at moisture contents of 15% and 11%, and on a sample of the Peat a CBR of 0.5% at a moisture content of 75%.

Site observations should be confirmed by in situ testing when formation level has been prepared.

It should be noted that raising levels over Peat will cause settlement, the extent of which will need to be assessed. Infrastructure protection and possible earthworks and/or ground improvement is likely required to mitigate against this.

11 FURTHER INVESTIGATION

Further investigation, to determine more accurately the effect of some of the identified hazards on the development, is recommended. This includes the following:

- Remediation Strategy.
- Gas Protection Measures Verification Plan.
- In-situ CBR testing when formation level has been established.
- Detailed Quantitative Risk Assessment for groundwater, and possible liaison with the Environment Agency, if required.
- Earthworks for flood mitigation measures.
- Settlement and slope stability assessment based on proposed levels.
- Pile mat design.

A copy of this report should be submitted to the Planning Department of the Local Authority/Local Authority EHO for review, if planning conditions exist for this site. A copy should also be sent to the NHBC for their records.

12 CONCLUSIONS

Based on the evidence currently available the site is assessed as being of moderate risk for geotechnical hazards and moderate risk for contamination hazards.



A P P E N D I X A

**GRM Development Solutions provides
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GENERAL APPRAISAL COMMENTS

i INFORMATION SOURCES

Where available the following sources have been used for the identification and assessment of potential ground hazards:

- Relevant British Standards
- British Geological Survey (BGS) Geology Map Scale 1:10,000 for local area
- British Geological Survey (BGS) Geology Map Scale 1:50,000/1:63,320
- BGS Memoir
- BGS Borehole Records
- BGS online viewer: <http://www.bgs.ac.uk/data/mapViewers/home.html>
- Environment Agency Groundwater Vulnerability Maps
- Historical Ordnance Survey (OS) Maps
- Environmental Data Report
- Environment Agency Website: <http://www.environment-agency.gov.uk/>
- Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, UKWIR, 2010.
- Coal Authority Records / Coal Mining Report
- DEFRA/Environment Agency Contaminated Land publications and DoE Industry Profiles
- BRE Guide BR211 (2015), 'Radon: Guidance on protective measures for new buildings'
- HPA-RPD-033 (2007), 'Indicative Atlas of Radon in England and Wales'
- PHE-CRCE-032 (PHE, 2017), Radon in Homes in England: 2016 Data Report
- CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings'
- BS8485:2015, 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'
- Other technical references used throughout this document are detailed in the text.

ii CONTAMINANTS OF CONCERN

The DoE Industry Profiles are normally used to assess likely contaminants from past land use and potential nearby industrial sources. For land uses where no profile is available, likely contaminants of concern are selected by GRM based on past experience of similar sites, a general screening suite of contaminants covered by CLEA and common contaminants from the Industry Profiles.

- | | | |
|------------|-------------------|--|
| • Arsenic | • Copper | • Water soluble sulphate |
| • Cadmium | • Nickel | • PAH (polycyclic aromatic hydrocarbons) |
| • Chromium | • Zinc | |
| • Lead | • Phenols | |
| • Mercury | • cyanide (total) | |
| • Selenium | • pH | |

Asbestos and PCBs are listed in the vast majority of profiles. PCBs are listed as the profiles expect electricity substations and switch boxes on all industrial sites. There is the potential for asbestos containing material to be mixed up with made ground, following any demolition works.

CONCEPTUAL MODEL METHODOLOGY

The consideration of contamination is based upon the principles of risk assessment, using the 'source-pathway-receptor' model in order to establish the presence, or potential presence, of a pollutant linkage.

To create a risk, contamination must have the potential to cause harm to susceptible targets or receptors such as humans, the water environment or the built environment. The potential for harm to occur requires three conditions to be satisfied to form a pollutant linkage:

- The presence of substances that may cause harm (SOURCE).
- The presence of a target which may be harmed (RECEPTOR).
- The existence of a plausible migration route between the source and the receptor (PATHWAY).

In the absence of a plausible pollutant linkage there is no risk. Where a potential linkage is identified in order for it not to pose a risk to the identified receptor it must be broken.

iv INTRUSIVE INVESTIGATION SAMPLING METHODOLOGY

The ground investigation (including fieldwork, sampling, monitoring and laboratory analyses) has been designed to identify and assess potential ground related problems and to allow cost effective solutions to be advised. It has been planned on the basis of the desk study, site inspection and the proposed development layout (where available). All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

The exploratory holes have been positioned and advanced to depths to determine the general ground/groundwater/gas conditions below the site. A general grid pattern has been adopted, where possible, to provide sufficient information based on the current proposed layout scheme. Some holes have been targeted at particular hazards identified in the Phase I assessment. The resultant exploratory hole density is considered to be commensurate with the complexity of the site conditions and detail of information required for this phase of the investigation.

v GROUND GAS RISK ASSESSMENT METHODOLOGY

Gas monitoring programmes undertaken by GRM are designed to broadly comply with the recommendations outlined in CIRIA Report C665 'Assessing risks posed by hazardous ground gas to buildings' (2007) and BS8576 'Guidance on Investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs) (2013).

To assess the risks posed by ground gases such as radon, carbon dioxide and methane, the relevant current guidance has been used. For radon the site has been assessed following the guidelines in 'Radon: guidance on protective measures for new dwellings (BR211: 2015)'. For methane and carbon dioxide the primary guidance document used to determine if protection measures are required is *BS8485:2015 Code of practice for the design of protective measures from methane and carbon dioxide ground gases for new buildings*. This uses hazardous gas flow rates (Q_{hg}), which are gas concentrations multiplied by borehole flow rates, to derive a Gas Flow Rate (GSF) for the site. The gas regime is then determined based on the GSF and other limiting factors such as gas concentrations.

Where flow is not recorded during the monitoring a default flow rate of 0.1l/hr will be used in the assessment to produce a positive result.

vi HUMAN HEALTH RISK ASSESSMENT METHODOLOGY

Guidance contained in the Environment Agency's CLEA Reports has been used to assess the risks posed to human health.

For residential developments that include domestic gardens the default Tier 1 Assessment Criteria (TAC) for 'residential land with plant uptake' are used, i.e. a female with a start age class of one and an end age class of six. All pathways are considered including the consumption of home-grown vegetables.

For residential developments that do not include domestic gardens the default Tier 1 Assessment Criteria (TAC) for 'residential land without plant uptake' are used, i.e. a female with a start age class of

one and an end age class of six. All pathways are considered except the consumption of home-grown vegetables.

For commercial/industrial developments the default Tier 1 Assessment Criteria (TAC) for 'commercial/industrial' are used, i.e. a female with a start age class of sixteen and an end age class of eighteen. All pathways are considered except the consumption of home-grown vegetables.

The TAC used by GRM include Category 4 Screening Levels (C4SLs) published by DEFRA, values calculated by GRM using the CLEA v1.071 risk assessment, and values and Suitable for Use Levels (S4UL) developed by LQM/CIEH. The TAC used in the assessment are selected based on the lowest site specific SOM values returned as part of the chemical analysis.

Where soil chemical analysis results are found to exceed the TAC, Site-Specific Risk Assessments may be undertaken using the CLEA v1.071 risk assessment software using the age classes and pathways described above.

vii RISK TO SITE WORKERS – GENERAL COMMENTS

The risks to site workers are similar to those posed to site end users, although likely to be less severe due to the site workers' shorter exposure to the identified contamination. However, site workers (particularly groundworkers) are more likely to come into direct contact with contaminated soils due to the nature of their work. On this basis ground and construction workers should be provided with basic Personal Protective Equipment based on the site's general health and safety risk assessment, but including as a minimum safety footwear, gloves and overalls.

A site specific risk assessment should be carried out for all hazards identified within the ground investigation in accordance with current health and safety legislation. This assessment should identify any measures required to further reduce risks i.e. providing further Personal Protective Equipment, welfare facilities and if necessary preventing access to certain areas.

Demolition and dismantling of existing structures on the site must be carried out to a safe and acceptable standard, in accordance with current UK guidance and best practice. Whilst not ground related, asbestos and hazardous substances surveys should be conducted prior to any demolition.

Any unusual colours, odours and suspicious ground should be reported immediately to site management and then GRM.

Whilst this appraisal has considered the long-term effects of contamination, GRM can also help during the formulation of Health and Safety documentation, if required.

viii CONTROLLED WATERS RISK ASSESSMENT METHODOLOGY

Where the desk study and fieldwork do not reveal a potential source of contamination no leachate or groundwater testing will be performed. Where a potential source is identified the testing will comprise leachate testing on the material considered most likely to pose a risk, groundwater testing will be undertaken if water is present at shallow depth.

The UK Drinking Water Standards (UKDWS) or Environmental Quality Standards (EQS) are usually adopted for comparison with the leachate/groundwater test results. When the most sensitive receptor is considered to be the aquifer (groundwater) UKDWS will be adopted as the Initial Tier 1 screening values. Where the most sensitive receptor is a surface water feature the EQS values will be used as Initial Tier I Screening values.

ix CONSTRUCTION MATERIALS RISK ASSESSMENT METHODOLOGY

The 'screening levels' adopted for the assessment of risk to construction materials are taken from the following documents:

- UK Water Industry Research (UKWIR) Contamination thresholds for sub-surface water pipes, for the protection of buried pipes.
- Building Research Establishment (BRE) Special Digest SD1 (2005), 'Concrete in Aggressive Ground', for the protection of buried concrete.

x WASTE DISPOSAL, SITE WASTE MANAGEMENT PLANS AND MATERIAL MANAGEMENT PLANS

Under current Waste Management Regulations, waste soil materials produced from the site will require characterisation to enable it to be disposed of correctly.

The chemical analysis results included in this report should be provided to the relevant landfill operators to establish the characterisation of the waste, confirm its suitability for landfill disposal and provide estimated costings. If material is classified as hazardous, then the site will need to be registered with the Environment Agency prior to the movement of the waste. Depending on the receiving landfill's current permit, further chemical analysis, incorporating Waste Acceptance Criteria (WAC) leachate analysis, may be required.

All materials removed from the site will be classified as 'waste' and therefore must be removed by a suitably licensed carrier of waste. This applies whether or not the waste is contaminated. All waste removed to landfill will attract Landfill Tax.

The developer/builder is likely to be classed as the waste producer and therefore, has a duty of care to ensure that all waste is disposed of appropriately. This includes ensuring the waste carrier is licensed and disposes of the waste to a suitably licensed landfill site. They are also required to keep a paper trail from 'cradle to grave' including copies of the waste disposal tickets.

Efficient materials management on site is recommended as it can lead to significant cost savings when compared to the traditional side casting or single stockpile of arisings. GRM can assist in the production of Material Management Plans under the CL:AIRE Definition of Waste: Code of Practice. The DoWCoP enables:

- The direct transfer and re-use of clean naturally occurring soil materials between sites, and
- The re-use of both contaminated and uncontaminated materials on their site of origin and between sites within defined Cluster projects.

GRM can also undertake the role of Qualified Person and submit the DoW CoP project Declaration.

Likewise making the site as volume neutral as possible will reduce the costs of development. Whilst not a statutory requirement, Site Waste Management Plans allow better waste management practices, help to reduce the amount of waste produced and identify best environmental disposal options. Implementing a Site Waste Management Plan (SWMP) can reduce costs (increasing business profits) and maximise resource efficiency.

xi GEOTECHNICAL ASSESSMENT GENERAL COMMENTS

Where finished floor levels of proposed structures have not been provided by the Client, then for the purposes of initial assessment, GRM will assume that finished levels will not vary appreciably from the existing ground levels. If the depths of any underground engineering works (i.e. sewers, pumping stations etc.) are unknown they will not be taken in to account in the assessment and it will be assumed that any such works will not compromise foundation or ground stability.

Should the development proposals or finished levels be different from these assumptions then the comments/recommendations in the Geotechnical Assessment may require revising.

It should be noted that the results of window sampling and/or cable percussive boreholes may not give a true indication of a soils actual engineering properties (i.e. stability, mass structure etc). GRM consider that that prior to development trial pitting should be undertaken to confirm the recommendations in the Geotechnical Assessment.

xii GEOTECHNICAL ASSESSMENT – ENGINEERING GROUND TREATMENT

Near surface soils have the potential to be disturbed by weathering and site traffic. Precautions should always be taken to avoid this, as excessive disturbance may leads to more onerous floor slab designs, road cap thickness and increased amounts of off-site disposal etc.

Near surface soils may need treatment or reinforcing to allow safe movement of construction plant and labour. An assessment by the contractor should be undertaken once the type of machinery/plant needed to complete the development is known.

xiii GEOTECHNICAL ASSESSMENT – EXCAVATIONS

Excavation instability (over-break) can result in damage to existing services or structures (e.g. foundations, roads or boundary walls/fences) both on and off-site, as well as increased foundation concrete costs. In order to minimise this, all excavations deeper than 1.2m deep (or any excavation within 1.5m of any existing structure or service) should be supported. Full support should be provided to the full depth of all near vertically sided excavations in made ground, soft and very soft clays and granular soils. A reduction to intermediate support should be acceptable within firm and stiffer natural clays.

Wherever possible, man entry into excavations should be prevented; however, where this is not possible, entry to, and time spent in, excavations should be kept to a minimum.

The build program should be tailored to reflect the impact that deep excavations through potentially unstable strata can have on adjacent properties, so that they are not undermined.

All excavations on site should be in accordance with HSE guidelines and stability should be practically maintained at all times. Reference should be made to HSE construction information sheet No. 8 (Revision 1) 'Safety in Excavations'.

Care should be taken to ensure that falls from excavation faces do not adversely affect the integrity of foundation concrete.

If contaminated water enters excavations it should be removed and transported to an appropriate treatment facility by a suitably licensed carrier before construction begins.

xiv GEOTECHNICAL ASSESSMENT – SUBSTRUCTURES

Where practicable, existing buried construction should be fully removed; however, if this is not practicable all new foundations should be carried down to fully penetrate it and it should be broken well away from all new structures.

There may be existing structures and/or infrastructure in close proximity to the proposed development. New build foundations may be constructed next to pavements with existing underground services beneath them, or excavations may be required near existing footings associated with adjacent properties. These potential hazards need to be taken into consideration when designing foundations and the groundworker needs to be made aware of their potential impact during the redevelopment works. Foundations close to existing underground services or buildings may require alternative foundation techniques (such as piling) to protect the integrity of these structures.

The contractor for the works should carry them out in such a fashion so as to not cause excessive overbreak, concrete usage or undermine existing buildings/roads/ services that are to be retained.

xv GEOTECHNICAL ASSESSMENT – SOAKAWAYS

Soakaway testing in trial pits by GRM is broadly carried out in accordance with BRE DG 365 (2016). The testing comprises the excavation of a test pit to a suitable depth, and the placement of water into the pit. The level of water present is then monitored over time. For borehole installations, the permeability testing (falling head/rising head) is undertaken in accordance with BS5930.

If it is decided to proceed with the use of soakaway drainage, then the following general points should be noted:

- Soakaways should not be placed so that water can be discharged through potentially contaminated made ground.
- The Environment Agency may require soakaways to be sealed systems such that only roof run off falls to soakaway.

- Interceptors are likely to be required for soakaways for highway drainage. The adopting authority for the highways should be consulted at the earliest opportunity regarding the use of soakaways for highways drainage.
- Consideration of site levels and slopes should be taken into account during the design.
- The construction of all soakaways should be in accordance with the current building regulations.
- Soakaways should not be placed within 5m of a proposed building.
- Placement of soakaways needs to be considered so as to avoid ponding of water down slope.
- The base of a soakaway should not be below the highest recorded water level.
- The Environment Agency prefer 1m of dry soil to be present between the base of a soakaway and the water table to provide attenuation for contamination.

xvi

GEOTECHNICAL ASSESSMENT – FOUNDATIONS

If soft or hard spots are encountered during foundation excavation then they should be replaced with suitably compacted material or the footings deepened to suitable strata, to avoid differential settlement.

If strata of differing bearing character (e.g. sand and clay) are encountered at foundation levels within the excavations for a single plot then the excavation depths should be altered as appropriate to ensure the foundations rest on a single stratum, or strata that will not induce differential settlement. Where this is impractical then GRM should be contacted to assess a reinforced concrete detail or an alternative foundation solution (e.g. piles or vibro-replacement).

NOTES ON LIMITATIONS**General**

GRM Development Solutions Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement had been executed, or with whom an assignment had been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from GRM Development Solutions Limited; a charge may be levied against such approval.

GRM Development Solutions Limited accepts no responsibility or liability for:

- a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and
- b) the consequences of this document being used by any third party with whom an agreement has not been executed.

Phase I Environmental Audits/ Desk Studies

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, GRM Development Solutions Limited reserves the right to review such information and as considered necessary and appropriate to modify the opinions accordingly. It should be noted that any risks identified in a Phase 1 report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits (Contamination Investigations)

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, and controlled waters.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as provisional only and must, in any event, be confirmed by a commercial adviser.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. Whilst exploratory testing is intended to gain an accurate representation of the site, the very nature of sampling and testing is such that it cannot ensure that all localised conditions are detected.

The risk assessment and opinions provided take in to consideration, inter alia, currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Phase II Geo-environmental Investigations (Combined Geotechnical and Contamination Investigations)

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environment risks together with engineering and development implications. If costs have been included in relation to site development a commercial adviser must confirm these.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site for each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time the site work was conducted. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects. The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

The risk assessment and opinions provided take in to consideration, inter alia, currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.



A P P E N D I X B

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NOTES:

Approximate Site
Boundary



DWELLING TYPE		GIFA	HEIGHT (STOREYS)	AMOUNT	%
1B	1B2P HOUSE	54.20m ²	2	06	12
F133	2B4P HOUSE	72.54m ²	2	24	48
F113	3B5P HOUSE	84.30m ²	2	02	40
F131	3B5P HOUSE	83.66m ²	2	18	
			TOTAL	50	100

1800mm brick wall
 1800mm close boarded fence
 Proposed Knee Rail
 Hatch
 sed trees
 retained
 removed
 Protection Area
 Bin storage

Rent to Buy
 Shared Ownership
 Rented



Laurus House, First Ave, Centrum 100,
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Partner Construction Ltd

Crease Drove, Crowland

Proposed Development Plan

ISSUE:

FINAL

DATE: June, 2019

DRAWING No:

1

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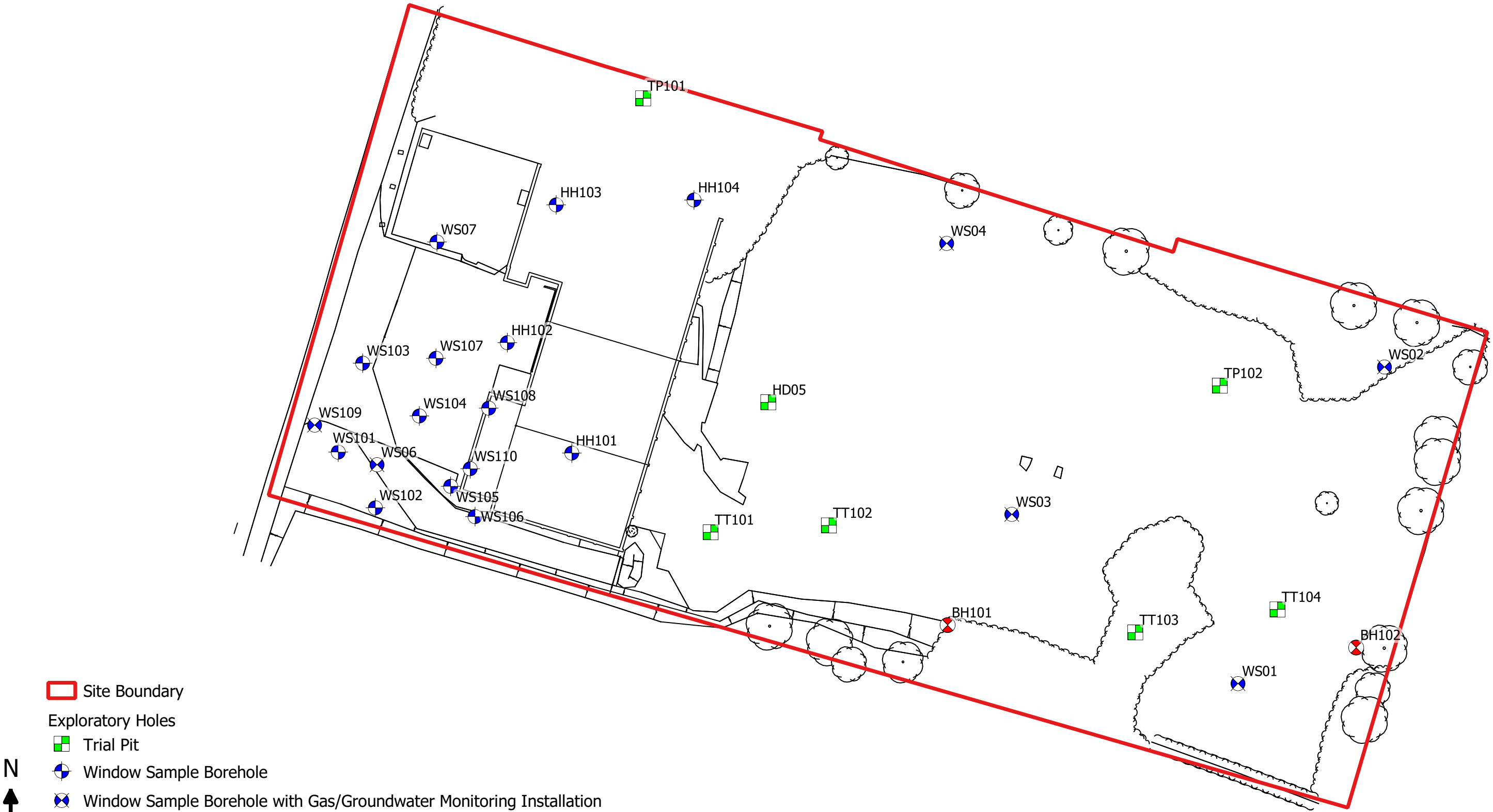
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Site Boundary

Exploratory Holes

Trial Pit

Window Sample Borehole

Window Sample Borehole with Gas/Groundwater Monitoring Installation

Cable Percussive Borehole with Gas/Groundwater Monitoring Installation



NOTES:

NOTES

CLIENT:	Partner Construction Ltd & Waterloo Housing Group Ltd
PROJECT:	Crease Drove, Crowland
TITLE:	Exploratory Hole Location Plan

PROJECT No:	P8723	DATE:	07/2019	DESIGN/DRAWN:	CM
DRAWING NUMBER:	02	ISSUE:	FINAL		
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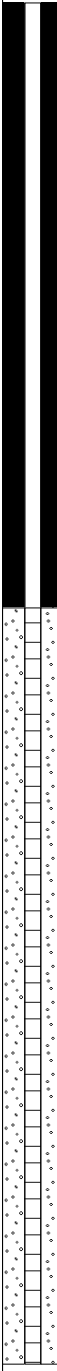
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Cable-Percussion Borehole			Borehole No. BH101	
Site Name: Crease Drove, Crowland							Sheet 1 of 2 Ground Level (mAOD) 1.69	
Client: Partner Construction Ltd					GRM Project Ref: P8723		Coordinates 523766 E 309626 N	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.60	B	N=10 (3,2/2,2,3,3)	0.60	1.09		Firm, brown, slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular, brick. MADE GROUND	1
		0.30	D						
		0.60 - 1.20	B						
		1.00	D						
		1.20 - 1.70	B						
		1.20	C	N=12 (3,2/1,2,3,6)	2.30	-0.61		Firm to stiff, brown to grey, gravelly CLAY. PEAT	2
		1.40	D						
		2.00	D						
		2.00 - 2.50	B	N=12 (3,2/1,2,3,6)	2.30	-0.61		Brown, slightly clayey, sandy GRAVEL. ABBEY SAND AND GRAVEL	2
		2.00	C						
		3.00 - 3.40	D	N=12 (1,1/2,3,3,4)	3.00			Firm to stiff, grey, gravelly CLAY. OXFORD CLAY	3
		3.00	S						
		4.00	U	N=26 (3,3/4,6,7,9)	4.00	-2.31		Stiff to very stiff, grey CLAY. OXFORD CLAY	4
		5.00 - 5.45	D						
		5.00	S						
	6.50	U	N=43 (5,7/9,9,11,14)	8.00			Stiff to very stiff, grey CLAY. OXFORD CLAY	5	
	8.00 - 8.45	D							
	8.00	S	N=43 (5,7/9,9,11,14)	8.00			Stiff to very stiff, grey CLAY. OXFORD CLAY	6	
									7
									8
									9

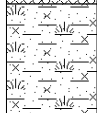
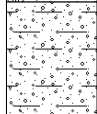
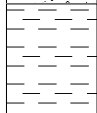
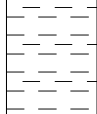
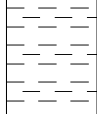
Crew: T. Beford, Site Investigation.		Logger: KD		Chiselling Details		
				Depth Top	Duration	Remarks
				1.00	00:30	
Equipment:				Casing Diameter by Depth		
Groundwater Remarks: Groundwater encountered at 1.8m begl, rising to 1.4m begl.				Depth Base	Diameter	Remarks
General Remarks:						
Hole Started: 04/06/2019		Hole Complete: 05/06/2019		Version: FINAL		Scale: 1:50

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Cable-Percussion Borehole			Borehole No. BH101 Sheet 2 of 2	
Site Name: Crease Drove, Crowland							Ground Level (mAOD) 1.69	
Client: Partner Construction Ltd					GRM Project Ref: P8723		Coordinates 523766 E 309626 N	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		9.50	U				Stiff to very stiff, grey CLAY. OXFORD CLAY		
		11.00 - 11.45 11.00	D S	N=46 (8,7/10,10,12,14)					
		12.50	U						
		14.50 - 14.95 14.50	D S	N=58 (13,12/12,14,15,17)					
					15.00	-13.31		End of Borehole at 15.00m	

Crew: T. Beford, Site Investigation.		Logger: KD		Chiselling Details		
Equipment: Groundwater Remarks: Groundwater encountered at 1.8m begl, rising to 1.4m begl. General Remarks:		Depth Top	Duration	Remarks		
		1.00	00:30			
		Casing Diameter by Depth				
		Depth Base	Diameter	Remarks		
Hole Started: 04/06/2019		Hole Complete: 05/06/2019		Version: FINAL		Scale: 1:50

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Cable-Percussion Borehole			Borehole No. BH102 Sheet 1 of 2	
Site Name: Crease Drove, Crowland							Ground Level (mAOD) 1.63	
Client: Partner Construction Ltd					GRM Project Ref: P8723		Coordinates 523843 E 309619 N	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	D				Firm, brown, gravelly CLAY. MADE GROUND		
		1.00	D	N=6 (1,1/1,2,1,2)	0.90	0.73		Firm, grey, sandy, silty organic CLAY PEAT	1
		1.20	C						
		1.50	D						
		2.00	C	N=5 (1,1/1,1,2,1)	1.70	-0.07		Loose to medium dense, brown, clayey, sandy GRAVEL. ABBEEY SAND AND GRAVEL	2
		2.50	D						
		3.00	D						
		3.00	C	N=9 (1,2/2,2,2,3)	3.20	-1.57		Firm to stiff, becoming very stiff, grey CLAY. OXFORD CLAY	3
		4.00 - 4.45	D						
		4.00	S	N=13 (2,3/3,3,3,4)					4
	5.00	U							5
	6.50 - 6.95	D	N=33 (6,6/7,8,8,10)						
	6.50	S							7
	8.00	U							8
							Continued on Next Sheet	9	

Crew: T. Bedford, Site Investigation.		Logger: KD.		Chiselling Details		
				Depth Top	Duration	Remarks
Equipment:						
Groundwater Remarks: Groundwater encountered at 4.2m begl, rising to 4.1m begl.				Casing Diameter by Depth		
General Remarks:				Depth Base	Diameter	Remarks
Hole Started: 05/06/2019		Hole Complete: 05/06/2019		Version: FINAL		Scale: 1:50

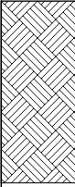
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Cable-Percussion Borehole			Borehole No. BH102	
Site Name: Crease Drove, Crowland							Sheet 2 of 2 Ground Level (mAOD) 1.63	
Client: Partner Construction Ltd					GRM Project Ref: P8723		Coordinates 523843 E 309619 N	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		9.50 - 9.95 9.50	D S	N=51 (8,9/10,13,13,15)			Firm to stiff, becoming very stiff, grey CLAY. OXFORD CLAY		
		11.00	U						
		12.50 - 12.95 12.50	D S	N=68 (10,12/14,16,17,21)					
		14.50	U						
					15.00	-13.37		End of Borehole at 15.00m	

Crew: T. Bedford, Site Investigation.		Logger: KD.		Chiselling Details		
Equipment:		Depth Top		Duration	Remarks	
Groundwater Remarks: Groundwater encountered at 4.2m begl, rising to 4.1m begl.		Casing Diameter by Depth				
		Depth Base		Diameter	Remarks	
General Remarks:						
Hole Started: 05/06/2019		Hole Complete: 05/06/2019		Version: FINAL		Scale: 1:50

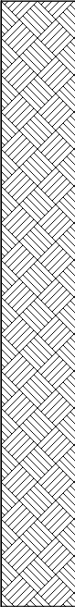
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No HD05 Sheet 1 of 1		
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 1.85		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523744 E 309667 N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.05 - 0.10	D		0.15 0.25	1.70 1.60		Brown and grey, gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to coarse. With some brick fragments. MADE GROUND Stiff, grey mottled orange-brown, slightly gravelly, slightly sandy CLAY. Sand is fine to medium. Gravel is fine to medium, subrounded, quartzite. ABBEY SAND AND GRAVEL End of Pit at 0.25m		
							1		
							2		
							3		
							4		
Date Excavated: 05/12/2018				Groundwater Observations:					
Date Backfilled: 05/12/2018				Seepage at 0.2m.					
Shoring:									
Stability:									
Plant Used: Hand Dug Pit				Trial Pit Dimensions (m): 		Reason for termination of Trial Pit:			
Logged by: LB						Refusal			
General Remarks:									
Relative density is approximate and determined by observation only.				Version: FINAL			Scale: 1:25		

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No HH101 Sheet 1 of 1	
Site Name: Crease Drove, Crowland								Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523715 E 309649 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.30 - 0.40	D			0.30	2.20		Grey concrete hardstanding. MADE GROUND	
		0.30 - 0.40	ES			0.60	1.90		Approximately loose to medium dense, buff, slightly clayey, slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to medium, limestone. Wet MADE GROUND End of Borehole at 0.600m	
										1
										2
										3
										4

Crew: GRM.			Logger: AL.			Weather: Sunny.		
Equipment: Hand Held Windowless Sampler.								
Reason for termination of borehole: Refusal on hard layer at 0.6m begl.								
Groundwater Remarks: Wet material from 0.3m to 0.6m begl.								
General Remarks:								
Hole Started: 05/06/2019			Hole Complete: 05/06/2019			Version: FINAL		Scale: 1:25

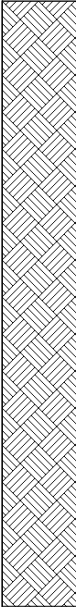
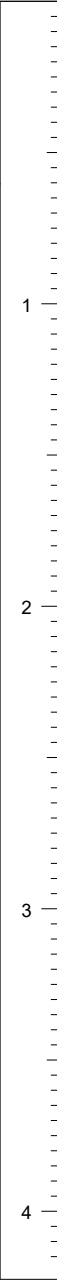
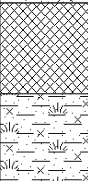
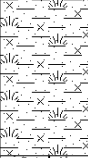
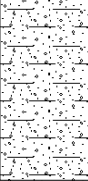
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No HH102 Sheet 1 of 1	
Site Name: Crease Drive, Crowland								Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523702 E 309669 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
						0.15	2.35	 Black asphalt / tarmac hardstanding. MADE GROUND  Grey concrete hardstanding. MADE GROUND  Approximately loose, buff, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular, limestone and quartzite. Wet. MADE GROUND  Firm, grey slightly sandy, silty organic CLAY. Sand is fine to coarse. Occasional fibrous plant material and natural organic odour present. PEAT  Soft light grey, sandy silty organic CLAY. Sand is fine to coarse. Natural organic odour present. PEAT  Approximately loose to medium dense, yellow brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-rounded, quartzite. Wet. ABBEY SAND AND GRAVEL		1
		0.40 - 0.50	D			0.40	2.10			
		0.40 - 0.50	ES			0.50	2.00			
		0.60 - 0.70	D			0.70	1.80			
		0.60 - 0.70	ES							
						1.30	1.20			
						2.00	0.50			
End of Borehole at 2.000m									2	
									3	
									4	

Crew: GRM.		Logger: AL.		Weather: Sunny.	
Equipment: Hand Held Windowless Sampler.					
Reason for termination of borehole: Design depth achieved.					
Groundwater Remarks: Wet material at 0.4m and 1.3m begl.					
General Remarks:					

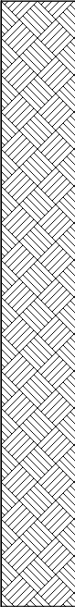
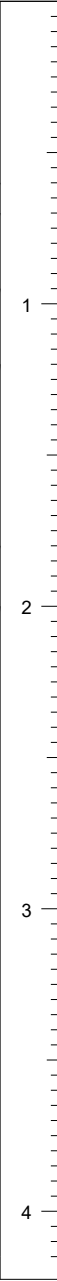
Hole Started:	05/06/2019	Hole Complete:	05/06/2019	Version:	FINAL	Scale:	1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No HH103 Sheet 1 of 1	
Site Name: Crease Drive, Crowland								Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523711 E 309691 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.30 - 0.40	D			0.30	2.20		Grey concrete Hardstanding. MADE GROUND	
		0.30 - 0.40	ES			0.60	1.90			
	0.90 - 1.00	D						Firm, dark grey stained black, slightly sandy, silty organic CLAY. Sand is fine to coarse. PEAT		
	0.90 - 1.00	ES			1.40	1.10			Approximately medium dense, light brown, slightly clayey, slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded, mudstone. Wet. ABBEY SAND AND GRAVEL	
	1.50 - 1.60	D			2.00	0.50			End of Borehole at 2.000m	
	1.50 - 1.60	ES								

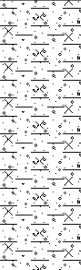
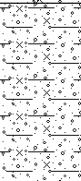
Crew: GRM.			Logger: AL.			Weather: Sunny.		
Equipment: Hand Held Windowless Sampler.								
Reason for termination of borehole: Design depth achieved.								
Groundwater Remarks: Wet material at 0.3m and 1.4m begl.								
General Remarks:								
Hole Started: 05/06/2019			Hole Complete: 05/06/2019			Version: FINAL		Scale: 1:25

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No HH104 Sheet 1 of 1	
Site Name: Crease Drove, Crowland								Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523732 E 309690 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.30 - 0.40	D			0.30	2.20		Grey concrete hardstanding. MADE GROUND	
		0.30 - 0.40	ES			0.60	1.90			
		0.70 - 0.80	D			0.70	1.80			
		0.70 - 0.80	ES			0.95	1.55			
		1.30 - 1.40	D			1.20	1.30			
		1.30 - 1.40	ES			1.80	0.70			
						2.00	0.50			
									Approximately dense, dark grey stained black, clayey SAND. Sand is fine to coarse. Strong Hydrocarbon odour present.	
									PEAT	
								Approximately medium dense to dense, light brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, quartzite.		
								ABBAY SAND AND GRAVEL		
								End of Borehole at 2.000m		

Crew: GRM.		Logger: AL.		Weather: Sunny.	
Equipment: Hand Held Windowless Sampler.					
Reason for termination of borehole: Design depth achieved.					
Groundwater Remarks: Wet material at 0.3m and 0.95m begl.					
General Remarks: 					
Hole Started: 05/06/2019		Hole Complete: 05/06/2019		Version: FINAL	
				Scale: 1:25	

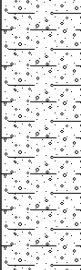
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log		Trial Pit No TP101 Sheet 1 of 1	
Site Name: Crease Drive, Crowland						Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd				GRM Project Ref: P8723		Coordinates 523716 E 309707 N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼				0.30	2.20		Vegetation over dark brown, slightly sandy, slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded, quartzite, mudstone and occasional chalk. MADE GROUND	1
	0.50 - 0.60 0.50 - 0.60	B D					Soft, light brown to yellow brown, slightly gravelly, very sandy, silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, quartzite and mudstone. ABBAY SAND AND GRAVEL	
	1.50 - 1.60 1.50 - 1.60	B D		1.20	1.30		Loose to medium dense, light brown, to yellow brown, slightly clayey, slightly silty, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular, quartzite, mudstone and occasional chalk. Wet. ABBAY SAND AND GRAVEL	2
	1.90 - 2.00 1.90 - 2.00	B D		1.80 2.00	0.70 0.50		Firm to stiff, grey, slightly sandy, gravelly CLAY with pockets of orange fine to coarse sand. Gravel is fine to coarse, sub-angular to rounded, chalk, limestone and occasional quartzite. OXFORD CLAY End of Pit at 2.00m	
								3
								4

Date Excavated: 04/06/2019		Groundwater Observations:	
Date Backfilled: 04/06/2019		Wet material at 1.2m begl.	
Shoring: None.			
Stability: Stable at full depth.			
Plant Used: JCB 3CX.		Reason for termination of Trial Pit:	
Logged by: AL.		Target depth achieved.	
General Remarks:			

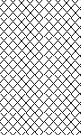
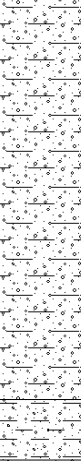
Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log		Trial Pit No TP102 Sheet 1 of 1	
Site Name: Crease Drive, Crowland						Ground Level (mAOD) 1.57	
Client: Partner Construction Ltd				GRM Project Ref: P8723		Coordinates 523812 E 309666 N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 	0.40 - 0.50	B D		0.30	1.27		Vegetation over dark brown, slightly sandy, gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded, brick, concrete, sandstone and ceramics. MADE GROUND	1 2 3 4
	0.40 - 0.50			0.50	1.07		Soft, light brown to yellow brown, slightly gravelly, very sandy, silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, chalk, limestone and quartzite. ABBEY SAND AND GRAVEL	
	1.00 - 1.10	B D		0.80	0.77		Soft, light brown to yellow brown, very sandy, silty CLAY. Sand is fine to coarse. ABBEY SAND AND GRAVEL	
	1.00 - 1.10			1.90	-0.33		Loose to medium dense, slightly clayey, very sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, chalk, quartzite and mudstone. Wet. ABBEY SAND AND GRAVEL	
End of Pit at 1.90m								

Date Excavated: 04/06/2019 Date Backfilled: 04/06/2019 Shoring: None. Stability: Stable at full depth. Plant Used: JCB 3CX. Logged by: AL.	Groundwater Observations: Wet material at 0.8m begl. Fast water ingress at 1.2m begl.
Trial Pit Dimensions (m): 0.45 2.20 Reason for termination of Trial Pit: Target depth achieved.	

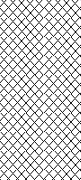
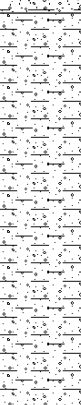
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log		Trial Pit No TT101-S Sheet 1 of 1	
Site Name: Crease Drive, Crowland						Ground Level (mAOD) 2.00	
Client: Partner Construction Ltd				GRM Project Ref: P8723		Coordinates 523738 E 309636 N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.40 - 0.50 0.40 - 0.50 0.50 - 0.60 0.50 - 0.60	B D B D		0.50	1.50		Dark brown, slightly sandy, gravelly silty CLAY, with a moderate cobble content. Sand is fine to coarse. Gravel is fine to coarse. Gravel and cobbles are angular to sub-rounded, brick, concrete, plastics, sandstone and limestone. MADE GROUND <i>Boulders of angular concrete between 0.4 to 0.5m begl.</i>	
	1.00 - 1.10 1.00 - 1.10	B D		0.70	1.30		Soft, dark brown, stained black, slightly gravelly silty CLAY. Gravel is fine to medium mudstone, sub-angular to rounded, mudstone. Natural organic odour present. PEAT Loose to medium dense, light brown, slightly clayey, very sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, quartzite. ABBEY SAND AND GRAVEL	1
	2.10 - 2.20 2.10 - 2.20	B D		2.10	-0.10		Firm to stiff, slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium, sub-rounded to rounded, chalk, limestone with occasional quartzite. OXFORD CLAY <i>End of Pit at 2.30m</i>	2
				2.30	-0.30			3
								4

Date Excavated: 04/06/2019		Groundwater Observations:	
Date Backfilled: 04/06/2019		Wet material at 1.1m. Fast water ingress at 1.8m begl.	
Shoring: None.			
Stability: Sidewall collapse at 0.7m begl.			
Plant Used: JCB 3CX.		Reason for termination of Trial Pit:	
Logged by: AL.		Target depth achieved.	
General Remarks: Combined with TT01-N.			

Relative density is approximate and determined by observation only.		Version: FINAL	Scale: 1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log		Trial Pit No TT102-N Sheet 1 of 1	
Site Name: Crease Drive, Crowland						Ground Level (mAOD) 1.80	
Client: Partner Construction Ltd				GRM Project Ref: P8723		Coordinates 523757 E 309640 N	

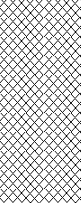
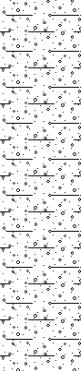
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼				0.60	1.20		Dark brown, slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded, brick, concrete, ceramics and metal. MADE GROUND	
				0.75	1.05			Medium dense, yellow brown, slightly gravelly, clayey, silty SAND. Sand is fine to coarse. Gravel is fine to medium, rounded, mudstone. ABBEY SAND AND GRAVEL
						Medium dense, yellow brown, slightly clayey, very sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, quartzite and mudstone. ABBEY SAND AND GRAVEL		
				2.10	-0.30			Firm to stiff, grey, slightly gravelly CLAY. Gravel is fine to coarse, chalk and limestone. OXFORD CLAY
				2.30	-0.50		End of Pit at 2.30m	
								3
								4

Date Excavated: 04/06/2019		Groundwater Observations:	
Date Backfilled: 04/06/2019		Wet material at 0.75m begl.	
Shoring: None.			
Stability: Stable at full depth.			
Plant Used: JCB 3CX.		Reason for termination of Trial Pit:	
Logged by: AL.		Target depth achieved.	

General Remarks: Combined with TT02-S.	
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Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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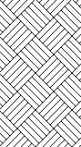
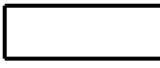
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log		Trial Pit No TT102-S Sheet 1 of 1	
Site Name: Crease Drove, Crowland						Ground Level (mAOD) 1.80	
Client: Partner Construction Ltd				GRM Project Ref: P8723		Coordinates 523757 E 309636 N	

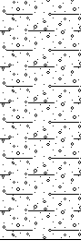
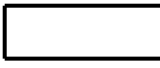
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50 - 0.60 0.50 - 0.60	B D		0.70	1.10		Dark brown, slightly sandy, gravelly, silty CLAY with a moderate cobble content. Sand is fine to coarse. Gravel is fine to coarse. Gravel and cobbles are angular to sub-rounded, brick, quartzite, concrete, ceramics and limestone. MADE GROUND	1
				1.20	0.60		Soft, dark grey stained black, slightly gravelly, slightly sandy, organic CLAY. Sand is fine to coarse. Gravel is fine to medium, mudstone. frequent slightly decomposed plant fibrous plant material. PEAT	
	1.80 - 1.90 1.80 - 1.90	B D		2.50	-0.70		Loose to medium dense, yellow brown, slightly clayey, very sandy GRAVEL. Sand is fine to coarse.. Gravel is fine to coarse, sub-angular to rounded, quartzite, chalk and mudstone. ABBEY SAND AND GRAVEL	2
				2.70	-0.90		Firm to stiff, grey, slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded to rounded, chalk, mudstone and occasional quartzite. OXFORD CLAY	
						End of Pit at 2.70m		3
								4

Date Excavated: 04/06/2019 Date Backfilled: 04/06/2019 Shoring: None. Stability: Stable at full depth. Plant Used: JCB 3CX. Logged by: AL.	Groundwater Observations: Fast water ingress at 1.6m begl. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"> Trial Pit Dimensions (m): 0.45 7.00 </td> <td style="width: 50%;"> Reason for termination of Trial Pit: Target depth achieved. </td> </tr> </table>	Trial Pit Dimensions (m): 0.45 7.00	Reason for termination of Trial Pit: Target depth achieved.
Trial Pit Dimensions (m): 0.45 7.00	Reason for termination of Trial Pit: Target depth achieved.		

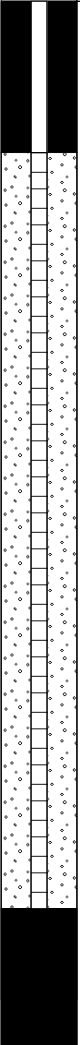
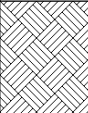
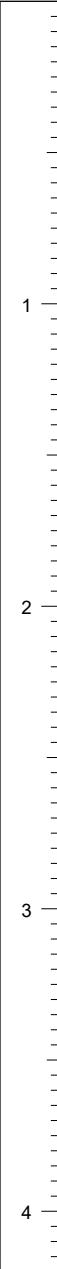
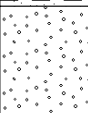
General Remarks: Combined with TT02-N.	
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Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TT103 Sheet 1 of 1		
Site Name: Crease Drove, Crowland							Ground Level (mAOD) 1.54		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523787 E 309627 N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
▼ ▼	0.40 0.40	B D		0.55	0.99		Vegetation over dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular, quartzite and mudstone. TOPSOIL		
	0.60 - 0.70 0.60 - 0.70	B D					<u>Band of sandy silty clay.</u> Soft, dark grey with occasional black staining, slightly gravelly, slightly sandy silty organic CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded, mudstone. Occasional decomposed fibrous plant material. Natural organic odour present. PEAT		
	1.20 - 1.30 1.20 - 1.30	B D		1.50	0.04		Loose, grey, slightly clayey silty fine to coarse SAND. Wet. ABBEY SAND AND GRAVEL		
	1.80 - 1.90 1.80 - 1.90	B D		1.60	-0.06		Loose to medium dense, yellow brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, mudstone, chalk and quartzite. ABBEY SAND AND GRAVEL		
					2.40	-0.86		End of Pit at 2.40m	
Date Excavated: 04/06/2019			Groundwater Observations:						
Date Backfilled: 04/06/2019			Wet material at 1.5m begl. Moderate water ingress at 2.1m begl.						
Shoring: None.			Trial Pit Dimensions (m): 0.45  7.50						
Stability: Slight sidewall collapse between 1.6 and 1.9m.									
Plant Used: JCB 3CX.			Reason for termination of Trial Pit:						
Logged by: AL.			Target depth achieved.						
General Remarks:									
Relative density is approximate and determined by observation only.									
Version: FINAL Scale: 1:25									

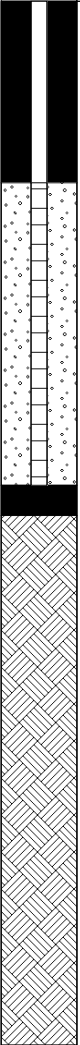
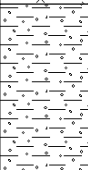
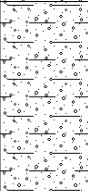
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log		Trial Pit No TT104 Sheet 1 of 1	
Site Name: Crease Drive, Crowland						Ground Level (mAOD) 1.59	
Client: Partner Construction Ltd				GRM Project Ref: P8723		Coordinates 523822 E 309632 N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
▼ ▼	0.30 - 0.40	B		0.40	1.19		Vegetation over dark brown, slightly gravelly, sandy, CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded, quartzite, mudstone and occasional chalk.
	0.30 - 0.40	D					
	0.50 - 0.60	B					
	0.50 - 0.60	D					
					0.50	1.09	
				1.70	-0.11		Soft, dark brown occasional stained black, slightly sandy, slightly gravelly silty organic CLAY. Sand is fine to coarse. Gravel is fine to medium, mudstone. Occasional decomposed plant material. Natural organic odour present. PEAT <i>Becoming sandy below 1.5m begl.</i>
	2.00 - 2.10	B					Loose to medium dense, yellow brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, quartzite and mudstone. ABBEY SAND AND GRAVEL <i>Wet material at 1.9m begl.</i>
	2.00 - 2.10	D		2.50	-0.91		End of Pit at 2.50m
Date Excavated: 04/06/2019				Groundwater Observations:			
Date Backfilled: 04/06/2019				Wet material at 1.9m begl, Moderate water ingress at 2.2m begl.			
Shoring: None.				Trial Pit Dimensions (m): 0.45  6.80			
Stability: Stable at full depth.							
Plant Used: JCB 3CX.				Reason for termination of Trial Pit:			
Logged by: AL.				Target depth achieved.			
General Remarks:							
Relative density is approximate and determined by observation only.				Version: FINAL		Scale: 1:25	

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS01 Sheet 1 of 1	
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 1.43	
Client: Partner Construction Ltd					GRM Project Ref: P8723		Coordinates 523827 E 309611 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.05 - 0.20	D	N=1 (0,0/0,1,0,0)		0.40	1.03		Dark brown, slightly sandy CLAY. sand is fine to medium. With a trace of rootlets. TOPSOIL	
		0.05 - 0.20	ES						- with some brick and slate fragments	
		0.50 - 0.60	D						Firm to stiff, grey-brown, CLAY. PEAT.	
		0.50 - 0.60	ES						Soft to firm, grey-brown stained yellow-brown, slightly sandy CLAY. Sand is fine to medium. With trace of rootlets. PEAT.	
		0.80 - 1.00	D							
		0.80 - 1.00	ES							
		1.00 - 1.45	SPTLS						Very soft to soft, grey slightly stained red-brown, silty CLAY. With a trace of roots. PEAT.	
		1.00 - 1.20	S							
		1.20 - 1.40	D							
		1.40 - 1.50	D						- grading dark brown, slightly sandy silty clay	
		1.50 - 1.70	D						Firm, grey, slightly gravelly CLAY. Gravel is fine to medium, subrounded, mudstone. PEAT.	
		1.70 - 2.00	D							
		2.00 - 2.45	SPTLS							
		2.00 - 2.50	S						Soft, grey frequently stained dark grey and black, sandy CLAY. Sand is fine to medium. With some rootlets and visible wood fragments. Faint organic odour. PEAT.	
		2.50 - 2.80	D							
2.80 - 3.00	D									
3.00 - 3.45	SPTLS	N=6 (1,1/1,2,2,1)		2.80	-1.37		Medium dense, brown to orange-brown, slightly clayey, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is fine to medium, subangular, quartzite. ABBEY SAND AND GRAVEL.			
3.00 - 3.00	S						N=15 (2,3/3,3,4,5)			
					3.45	-2.02		End of Borehole at 3.450m		

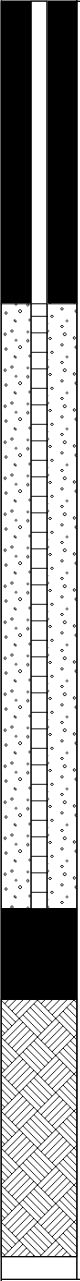
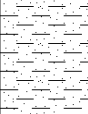
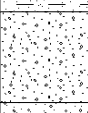
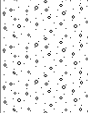
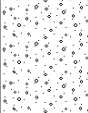
Crew: RGI		Logger: LB		Weather: Rain	
Equipment: Tracked Window Sampling Rig					
Reason for termination of borehole: Target depth reached					
Groundwater Remarks: 2.0m.					
General Remarks:					
Hole Started:	05/12/2018	Hole Complete:	05/12/2018	Version:	FINAL
				Scale:	1:25

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS02 Sheet 1 of 1		
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 1.48		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523843 E 309660 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description		
		Depth	Type	Result							
		0.20	D						Brown-grey CLAY. With some rootlets. TOPSOIL.		
		0.20	ES								
		0.60					0.88		Firm, dark brown, silty CLAY. With trace of rootlets. PEAT.		
		0.80	D				0.73				
		0.80	ES						Firm to stiff, brown and orange-brown, slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium, subangular and quartzite. Wet. ABBEY SAND AND GRAVEL. - stiff to very stiff, slightly sandy gravelly CLAY, wet		
		1.00 - 1.45	SPTLS	N=33 (1,7/8,8,8,9)							
		1.00	S								
		1.30	D				1.30	0.18			Medium dense, brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to medium, subangular and subrounded, quartzite. ABBEY SAND AND GRAVEL. - grading orange-brown sandy GRAVEL - grading slightly clayey sandy GRAVEL
		1.80	D								
		2.00 - 2.45	SPTLS	N=20 (3,4/5,4,6,5)							
		2.00	S								
		2.70	D								
		3.00 - 3.45	SPTLS	N=13 (3,3/3,2,4,4)							
		3.00	S								
						3.45	-1.97		End of Borehole at 3.450m		

Crew: RGI		Logger: LB		Weather: Rain	
Equipment: Tracked Window Sampling Rig					
Reason for termination of borehole: Target depth reached					
Groundwater Remarks: 0.8m.					
General Remarks:					
Hole Started:	05/12/2018	Hole Complete:	05/12/2018	Version:	FINAL
				Scale:	1:25

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS03 Sheet 1 of 2		
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 1.54		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523785 E 309636 N	

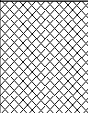
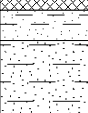
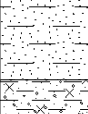
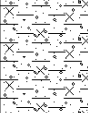
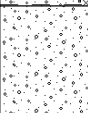
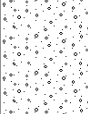
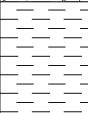
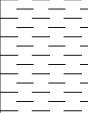
Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.20 0.20	D ES			0.30	1.24		Dark brown CLAY. With some rootlets. TOPSOIL.	
						0.55	0.99		Firm to stiff, grey, slightly gravelly, sandy CLAY. Sand is fine. Gravel is fine, subangular, mudstone and quartzite. PEAT.	
		0.70 0.70	D ES						Stiff, brown and orange-brown, slightly gravelly sandy CLAY. Sand is fine to medium. Gravels is fine, subangular, mudstone and quartzite. ABBEY SAND AND GRAVEL.	
		1.00 - 1.45	SPTLS	N=28 (1,5/5,7,8,8)		1.00	0.54		- grading firm to stiff slightly sandy CLAY Medium dense, grey-brown, slightly clayey, slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to medium, subangular, quartzite. With some shells. Wet. ABBEY SAND AND GRAVEL.	1
		1.00 1.20	S D			1.30	0.24		Medium dense, brown to orange-brown, slightly clayey, sandy GRAVEL. Sand is fine to medium. Gravel is fine to medium, subangular, quartzite. ABBEY SAND AND GRAVEL.	
		1.70	D						- grading sandy GRAVEL	
		2.00 - 2.45	SPTLS	N=11 (3,3/4,3,2,2)						2
		2.00	S							
		2.60	D							
		2.95 3.00 - 3.45 3.00	D SPTLS S	N=29 (4,4/5,7,9,8)		2.95	-1.41		Stiff, grey, CLAY. OXFORD CLAY.	3
	3.90 4.00 - 4.45 4.00	D SPTLS S	N=20 (2,2/4,5,5,6)						4	

Crew: RGI		Logger: LB		Weather: Rain	
Equipment: Tracked Window Sampling Rig					
Reason for termination of borehole: Target depth reached					
Groundwater Remarks: 1.0m.					
General Remarks:					

Hole Started:	05/12/2018	Hole Complete:	05/12/2018	Version:	FINAL	Scale:	1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No WS03 Sheet 2 of 2		
Site Name: Crease Drove, Crowland								Ground Level (mAOD) 1.54		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523785 E 309636 N		
Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
						4.45	-2.91		Stiff, grey, CLAY. OXFORD CLAY.	
									End of Borehole at 4.450m	
										5
										6
										7
										8
Crew: RGI					Logger: LB			Weather: Rain		
Equipment: Tracked Window Sampling Rig										
Reason for termination of borehole: Target depth reached										
Groundwater Remarks: 1.0m.										
General Remarks:										
Hole Started: 05/12/2018		Hole Complete: 05/12/2018		Version: FINAL		Scale: 1:25				

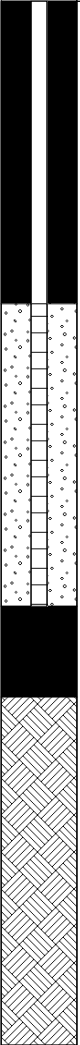
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS04 Sheet 1 of 1		
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 1.62		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523775 E 309677 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description		
		Depth	Type	Result							
		0.20 0.20	D ES						Brick fill, fine to coarse gravel and cobbles of brick, slightly clayey. MADE GROUND.		
						0.40 0.50	1.22 1.12			Stiff, grey mottled orange-brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is fine to medium, subangular, quartzite. ABBEY SAND AND GRAVEL.	
		0.70	D							Medium dense, brown and orange-brown, slightly gravelly, clayey SAND. Sand is fine to medium. Gravel is fine to medium, subangular, quartzite. ABBEY SAND AND GRAVEL.	
		1.00 - 1.45 1.00	SPTLS S	N=24 (2,4/5,6,7,6)		1.00	0.62			Wet. ABBEY SAND AND GRAVEL. - sandy CLAY from 0.6m to 0.75m	1
		1.40	D							Stiff, grey-brown, slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel is fine, subangular, quartzite. ABBEY SAND AND GRAVEL.	
		1.60	D			1.50	0.12			Medium dense, orange-brown, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to medium, subangular, quartzite. Wet. ABBEY SAND AND GRAVEL. - Gravelly CLAY band from 1.7m to 1.9m	2
		2.00 - 2.45 2.00	SPTLS S	N=11 (2,1/2,2,4,3)							
		2.80	D			2.60	-0.98			Stiff, grey mottled orange-brown, CLAY OXFORD CLAY. - selenite observed from 2.6m to 2.8m	
		3.00 - 3.45 3.00	SPTLS S	N=17 (2,2/4,5,4,4)						- grey	3
						3.45	-1.83			End of Borehole at 3.450m	4

Crew: RGI		Logger: LB		Weather: Rain	
Equipment: Tracked Window Sampling Rig					
Reason for termination of borehole: Target depth reached					
Groundwater Remarks: 1.5m.					
General Remarks:					

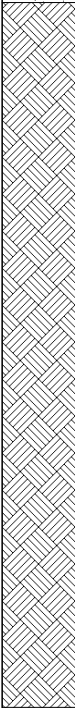
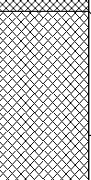
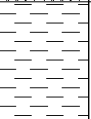
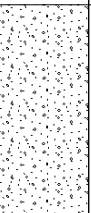
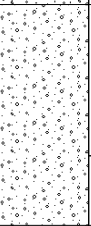
Hole Started:	05/12/2018	Hole Complete:	05/12/2018	Version:	FINAL	Scale:	1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No WS06 Sheet 1 of 1	
Site Name: Crease Drove, Crowland								Ground Level (mAOD) 2.39	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523682 E 309646 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description				
		Depth	Type	Result									
		0.40	D	N=6 (1,1/1,2,2,1)		0.30	2.09		Dark grey and brown, gravelly SAND. Sand is fine to medium. Gravel is fine to medium, subangular, slate and quartzite. MADE GROUND.	1			
		0.40	ES			0.50	1.89				Approximately medium dense, light brown, slightly sandy, cobbly GRAVEL. sand is fine to medium. Gravel is fine to coarse, subrounded and subangular, sandstone. MADE GROUND.		
		0.90	ES			0.75	1.64				Firm to stiff, grey, slightly sandy CLAY. Sand is fine to medium. POSSIBLE MADE GROUND.		
		1.00	D			0.85	1.54				Firm, dark grey, slightly sandy, silty CLAY. Sand is fine. POSSIBLE MADE GROUND.		
				1.00 - 1.45	SPTLS	N=19 (3,5/5,4,5,5)					Soft to firm, grey frequently stained black, slightly gravelly clay. Gravel is fine to medium, subangular. Strong hydrocarbon odour. PEAT.	2	
				1.45	S			- faint hydrocarbon odour, grading stiff, grey mottled orange-brown, wet					
				1.90	D			2.00	0.39				Stiff, orange-brown, slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular, quartzite. ABBEY SAND AND GRAVEL. Wet.
				2.00 - 2.45	SPTLS			- grading medium dense, orange-brown, slightly clayey, gravelly SAND.					
				2.00	S	N=21 (2,3/4,4,5,8)		2.40	D		Stiff, grey, slightly gravelly CLAY. Gravel is fine to medium, subangular, chalk and rare flint. Oxford Clay.	3	
				2.40	D			2.60	-0.21				Stiff, grey, CLAY. OXFORD CLAY
		2.90	D	3.00	-0.61				Stiff, grey, CLAY. OXFORD CLAY				
		3.00 - 3.45	SPTLS	3.45	-1.06				End of Borehole at 3.450m		4		
		3.00	S										

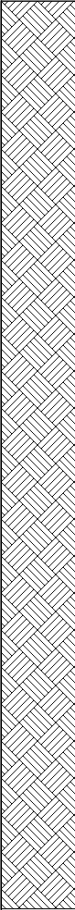
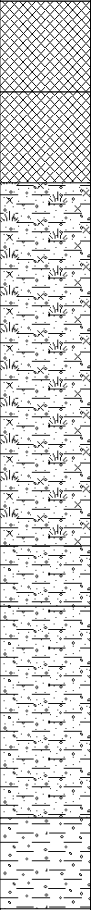
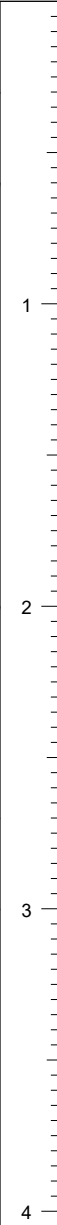
Crew: RGI		Logger: LB		Weather: Rain	
Equipment: Tracked Window Sampling Rig					
Reason for termination of borehole: Target depth reached					
Groundwater Remarks: 1.5m.					
General Remarks:					
Hole Started: 05/12/2018		Hole Complete: 05/12/2018		Version: FINAL	
				Scale: 1:25	

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS07 Sheet 1 of 1		
Site Name: Crease Drove, Crowland							Ground Level (mAOD) 2.49		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523690 E 309682 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description		
		Depth	Type	Result							
		0.30	ES			0.04	2.45		ASPHALT/TARMAC Approximately medium dense, light brown, gravelly SAND. Sand is fine to medium. Gravel is fine to medium, subangular, quartzite. MADE GROUND. - sandstone cobble band (50mm)	1	
		0.70	D			0.60	1.89				Firm, dark grey, slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel is fine, subangular and quartzite. with rare wood fragments. PEAT.
		0.70	ES								
		0.90	D								
		0.90	ES								
		1.00	S	N=15 (2,2/3,3,4,5)		1.00	1.49		Medium dense, brown, slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to medium, subangular, quartzite. Wet. ABBEY SAND AND GRAVEL.		
		1.10	D								
		1.20	ES								
		1.20	ES								
				1.80	D			1.70	0.79		
		2.00	S	N=51 (1,5/51 for 275mm)		2.43	0.06	End of Borehole at 2.430m			
										3	
										4	

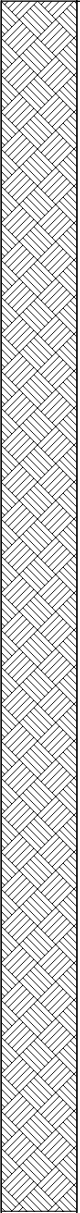
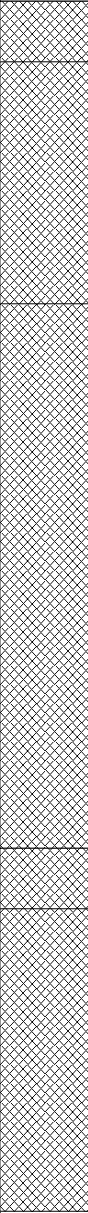
Crew: RGI		Logger: LB		Weather: Rain	
Equipment: Tracked Window Sampling Rig					
Reason for termination of borehole: Refusal					
Groundwater Remarks: 0.35m.					
General Remarks:					
Hole Started:	05/12/2018	Hole Complete:	05/12/2018	Version:	FINAL
				Scale:	1:25

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No WS101 Sheet 1 of 1	
Site Name: Crease Drive, Crowland								Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523672 E 309651 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.40	D			0.30	2.20		Vegetation over dark brown, slightly sandy, slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to medium, sub-angular to sub-rounded, quartzite, chalk, limestone with occasional brick and concrete. MADE GROUND	
		0.40	ES			0.60	1.90		Medium dense, yellow brown, slightly gravelly, slightly clayey SAND with a low cobble content. Sand is fine to coarse. Gravel is fine to coarse. Gravel and cobbles are angular to sub-rounded, brick and concrete. MADE GROUND	
		0.70 - 0.80	D						Soft, dark grey, slightly gravelly, slightly sandy, organic silty CLAY. Sand is fine to coarse. Gravel is fine to medium, sub-rounded to rounded. Frequent decomposed fibrous plant material present. Black staining and organic odour present. PEAT	
		0.70 - 0.80	ES						<i>Wet material below 1.4m begl.</i>	
		1.20 - 1.30	D			1.80	0.70		Soft, light brown, slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, quartzite, chalk, mudstone and limestone. ABBEY SAND AND GRAVEL	
		1.20 - 1.30	ES			2.00	0.50		<i>Band of gravelly fine to coarse sand (approx. 7cm).</i>	
		1.80 - 1.85	D						Soft, light brown, slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium, rounded to sub-rounded, quartzite, chalk and mudstone. ABBEY SAND AND GRAVEL	
		2.40 - 2.50	D			2.70	-0.20		<i>Band of gravelly fine to coarse sand.</i>	
		2.80 - 2.90	D			3.00	-0.50		Firm, grey, slightly gravelly CLAY. Gravel is fine to medium, sub-rounded to rounded, chalk, limestone and occasional mudstone. OXFORD CLAY	
									End of Borehole at 3.000m	

Crew: RGI.		Logger: AL.		Weather: Sunny	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Target depth achieved.					
Groundwater Remarks: Wet material from 1.4m begl.					
General Remarks:					
Hole Started: 03/06/2019		Hole Complete: 03/06/2019		Version: FINAL	
				Scale: 1:25	

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No WS102 Sheet 1 of 1	
Site Name: Crease Drive, Crowland								Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523684 E 309641 N	

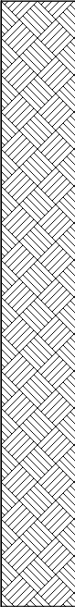
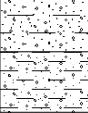
Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.60	D ES			0.20	2.30		Dark brown, slightly sandy, gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded, sandstone, concrete, brick and asphalt. MADE GROUND	
		0.60								
		1.00 - 2.00	D			1.00	1.50		Poor recovery 1-2m (approx 10%). Recovered Loose, grey mottled red, slightly sandy, gravelly COBBLES. Sand is fine to coarse. Gravel is fine to coarse. Gravel and cobbles are angular to sub-angular, brick and concrete. MADE GROUND	1
		2.80 - 3.00	D			2.80	-0.30		Very soft, dark grey stained black, slightly sandy, slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded, mudstone. Strong Hydrocarbon odour and sheen present. Wet. PEAT Poor recovery (10%) 3-4m, recovered stained black COBBLES of brick. MADE GROUND	3
		2.80 - 3.00	ES			3.00	-0.50			
3.00 - 4.00	D									
						4.00	-1.50		End of Borehole at 4.000m	4

Crew: RGI.		Logger: AL.		Weather: Sunny	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Target depth achieved.					
Groundwater Remarks: Wet material from 2.8m to 3.0m begl, with black staining and hydrocarbon odour.					
General Remarks:					

Hole Started:	03/06/2019	Hole Complete:	03/06/2019	Version:	FINAL	Scale:	1:25
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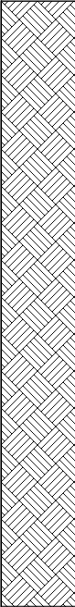
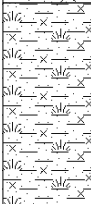
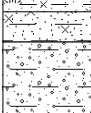
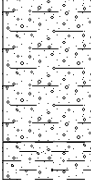
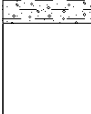
Hole Started:	03/06/2019	Hole Complete:	03/06/2019	Version:	FINAL	Scale:	1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS104 Sheet 1 of 1		
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 2.56		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523687 E 309656 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.30 - 0.45	D			0.10	2.46	 Black asphalt hardstanding. MADE GROUND  Grey concrete hardstanding. Recovered as a grey sandy GRAVEL. MADE GROUND  Loose, grey, slightly clayey, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular, limestone. MADE GROUND  Soft, dark grey, slightly sandy, slightly gravelly organic silty CLAY. Sand is fine to coarse. Gravel is fine to medium, sub-rounded, mudstone. Occasional slightly decomposed fibrous plant material. PEAT <i>No hydrocarbon odour or sheen below 0.9m begl.</i>  Approximately loose to medium dense, light brown, slightly gravelly, silty SAND. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded, mudstone. Hydrocarbon odour and sheen. ABBEY SAND AND GRAVEL Firm, dark grey, slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium, sub-rounded, chalk, limestone and mudstone. OXFORD CLAY End of Borehole at 2.000m		
		0.45 - 0.50	ES			0.30	2.26			
		0.50 - 0.60	D			0.60	1.96			
		0.60 - 0.60	ES							
		1.50 - 1.60	D			1.60	0.96			
		1.60 - 1.60	ES			1.80	0.76			
						2.00	0.56			

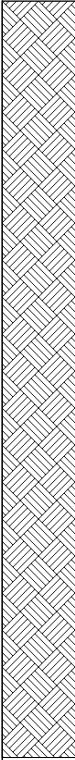
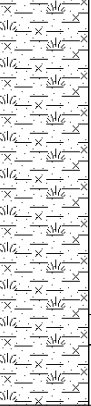
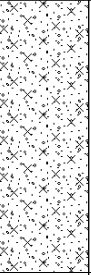
Crew: RGI.		Logger: AL.		Weather: Sunny.	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Target depth achieved.					
Groundwater Remarks: Wet material at 1.6m begl.					
General Remarks:					
Hole Started: 03/06/2019		Hole Complete: 03/06/2019		Version: FINAL	
				Scale: 1:25	

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No WS105 Sheet 1 of 1	
Site Name: Crease Drive, Crowland								Ground Level (mAOD) 2.42	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523691 E 309646 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
									Grey concrete hardstanding, recovered as a grey sandy GRAVEL of concrete. MADE GROUND	
		0.30				2.12			Soft, dark grey, slightly sandy, silty organic CLAY. Sand is fine to coarse. Occasional decomposed fibrous plant material. PEAT.	
		0.70 - 0.80	D							
		0.70 - 0.80	ES							
		1.00				1.42			Approximately medium dense, dark grey, slightly clayey silty SAND. Sand is fine to coarse. Organic odour present.	1
		1.10 - 1.20	D							
		1.10 - 1.20	ES							
		1.80				0.62			Approximately loose to medium dense, yellow brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, quartzite and occasional mudstone. (Slight hydrocarbon odour present.	
		2.00				0.42			FIRM TO STIFF, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, chalk and limestone.	2
									OXFORD CLAY End of Borehole at 2.000m	
									3	
									4	

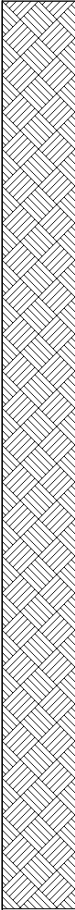
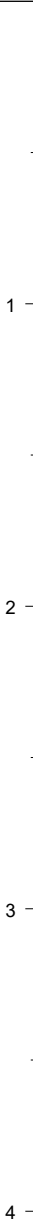
Crew: RGI.		Logger: AL.		Weather: Sunny.	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Target depth achieved.					
Groundwater Remarks: Wet material at 1.1m begl.					
General Remarks:					
Hole Started: 03/06/2019		Hole Complete: 03/06/2019		Version: FINAL	
				Scale: 1:25	

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No WS106 Sheet 1 of 1	
Site Name: Crease Drive, Crowland								Ground Level (mAOD) 2.30	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523699 E 309638 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
		0.50 - 0.60	D			0.25	2.05		Grey concrete hardstanding, recovered as a grey sandy GRAVEL of concrete. MADE GROUND	1
		0.50 - 0.60	ES						Soft, dark grey, slightly gravelly, silty organic CLAY with occasional fine to coarse sand pockets. Gravel is fine to medium, sub-rounded to rounded. Frequent decomposed plant material. Natural organic odour present. PEAT	
		<i>Band of gravelly fine to coarse sand (approx. 5cm) becoming sandy below 1.4m begl.</i>								
		1.70 - 1.80	D			1.60	0.70		Approximately loose, light brown, gravelly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, chalk, quartzite and mudstone. ABBEE SAND AND GRAVEL	2
		1.70 - 1.80	ES							
		2.40 - 2.50	D			2.50	-0.20		End of Borehole at 2.500m	3
		2.40 - 2.50	ES							
										4

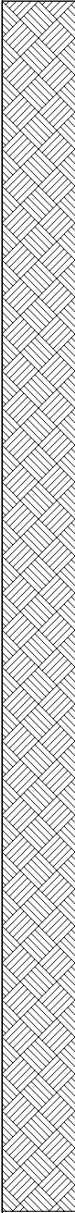
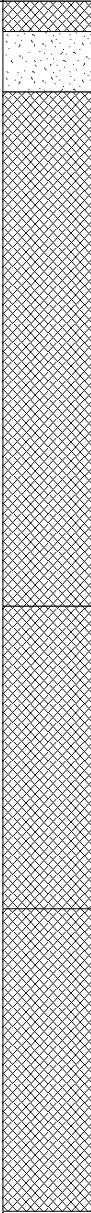
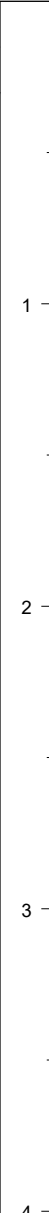
Crew: RGI.	Logger: AL.	Weather: Sunny.
Equipment: Tracked Window Sampler.		
Reason for termination of borehole: Target depth achieved.		
Groundwater Remarks: Wet material at 1.8m begl.		
General Remarks:		
Hole Started: 03/06/2019	Hole Complete: 03/06/2019	Version: FINAL
		Scale: 1:25

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS107 Sheet 1 of 1	
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 2.60	
Client: Partner Construction Ltd					GRM Project Ref: P8723		Coordinates 523688 E 309667 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
						0.15	2.45		Black asphalt / tarmacadam hardstanding.	
						0.25	2.35		MADE GROUND	
									Grey concrete hardstanding, recovered as a grey sandy GRAVEL of concrete.	
									MADE GROUND	
						0.70	1.90		Approximately loose to medium dense, yellow brown, slightly clayey gravelly SAND, with a low cobble content. Sand is fine to coarse. Gravel is fine to coarse. Gravel and cobbles are sub-angular, concrete and limestone.	
									MADE GROUND	
									Soft, dark brown to grey, slightly gravelly silty organic CLAY. Gravel is fine to medium, rounded to sub-rounded, mudstone and quartzite. Natural organic odour and frequent fibrous decomposed plant material present. PEAT.	
						1.60	1.00		PEAT	
						1.80	0.80		Approximately medium dense, dark grey, fine to coarse SAND. Strong Hydrocarbon odour and sheen present. PEAT	
									PEAT	
				2.20	0.40		Soft, dark brown to grey, slightly gravelly silty organic CLAY. Gravel is fine to medium, rounded to sub-rounded, mudstone and quartzite. PEAT			
							PEAT			
							Approximately loose to medium dense, yellow brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded, quartzite and mudstone.			
							ABBEE SAND AND GRAVEL			
								End of Borehole at 3.000m	3	
						3.00	-0.40			4

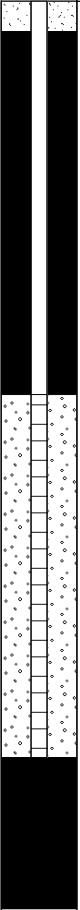
Crew: RGI.		Logger: AL.		Weather: Sunny.	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Target depth achieved.					
Groundwater Remarks: Wet material at 1.6m to 1.7m begl, with hydrocarbon odour and sheen.					
General Remarks:					
Hole Started:	03/06/2019	Hole Complete:	03/06/2019	Version:	FINAL
				Scale:	1:25

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole				Borehole No WS108 Sheet 1 of 1	
Site Name: Crease Drove, Crowland								Ground Level (mAOD) 2.50	
Client: Partner Construction Ltd						GRM Project Ref: P8723		Coordinates 523700 E 309660 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
						0.15	2.35		Black asphalt / tarmacadam hardstanding. MADE GROUND	
						0.30	2.20		Grey concrete hardstanding, recovered as grey sandy GRAVEL of concrete. MADE GROUND	
									Poor recovery 1-2 m due to cobbles pushing material down borehole. Liner wet and stained black. MADE GROUND	
						2.00	0.50		Poor recovery 2-3m sample (approx. 20%) due to cobble pushing material down borehole. MADE GROUND	
						3.00	-0.50		Poor recovery 3-4m sample (approx. 10%). Material recovery as a firm, light brown, sandy CLAY. Material and liner was stained black. MADE GROUND	
						4.00	-1.50		End of Borehole at 4.000m	

Crew: RGI.		Logger: AL.		Weather: Sunny	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Terminated due to poor recovery as cobble pushed material down borehole.					
Groundwater Remarks: Liners recovered wet and black stained with hydrocarbon odour.					
General Remarks:					
Hole Started: 03/06/2019		Hole Complete: 03/06/2019		Version: FINAL	
				Scale: 1:25	

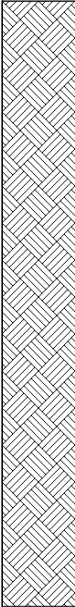
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS109 Sheet 1 of 1		
Site Name: Crease Drive, Crowland							Ground Level (mAOD) 2.14		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523708 E 309634 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
									Turf over, light brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-rounded, concrete and quartzite. MADE GROUND	
						0.80	1.34		<i>Band of grey fine to coarse sand.</i>	
						1.20	0.94		Soft, dark grey, slightly gravelly, organic silty CLAY. Gravel is fine to medium, sub-rounded to rounded, mudstone. Frequent decomposed fibrous plant material. PEAT	1
		1.50 - 1.60	D						Soft, dark grey, sandy, silty organic CLAY. Sand is fine to coarse. Hydrocarbon odour and sheen present. Pockets of black staining. PEAT	
		1.50 - 1.60	ES							
										2
		2.80 - 2.90	D			2.60	-0.46		Approximately loose to medium dense, light brown, slightly clayey, sandy silty GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, mudstone. Hydrocarbon odour and sheen present. ABBEY SAND AND GRAVEL	
		2.80 - 2.90	ES			3.00	-0.86		End of Borehole at 3.000m	3
										4

Crew: RGI.		Logger: AL.		Weather: Sunny.	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Target depth achieved.					
Groundwater Remarks: Wet material at 2.6m begl.					
General Remarks:					

Hole Started:	03/06/2019	Hole Complete:	03/06/2019	Version:	FINAL	Scale:	1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Windowless Sample Borehole			Borehole No WS110 Sheet 1 of 1		
Site Name: Crease Drove, Crowland							Ground Level (mAOD) 2.45		
Client: Partner Construction Ltd					GRM Project Ref: P8723			Coordinates 523693 E 309649 N	

Installation/ Backfill	Water Strike	Samples/Tests			Dynamic Probing (Blows per 100mm)	Depth (m)	Level (m)	Legend	Stratum Description	
		Depth	Type	Result						
						0.30	2.15		Vegetation over dark brown slightly sandy, gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is fine to coarse. Gravel and cobbles are sub-angular, brick and quartzite.	1
									MADE GROUND	
		0.60 - 0.70	D						Soft, dark grey slightly sandy, silty organic CLAY. Sand is fine to coarse. Occasional decomposed, fibrous plant material present. Natural organic odour present.	
		0.60 - 0.70	ES						PEAT	
		1.00	D			0.95	1.50		Approximately loose to medium dense, yellow brown, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded, quartzite and mudstone.	2
									ABBEE SAND AND GRAVEL	
		1.80 - 1.90	D			1.60	0.85		Firm to stiff, grey, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium, chalk and occasional limestone.	
						2.00	0.45		OXFORD CLAY	3
									End of Borehole at 2.000m	4

Crew: RGI.		Logger: AL.		Weather: Sunny.	
Equipment: Tracked Window Sampler.					
Reason for termination of borehole: Target depth achieved.					
Groundwater Remarks: Wet material at 0.95m begl.					
General Remarks:					

Hole Started:	03/06/2019	Hole Complete:	03/06/2019	Version:	FINAL	Scale:	1:25
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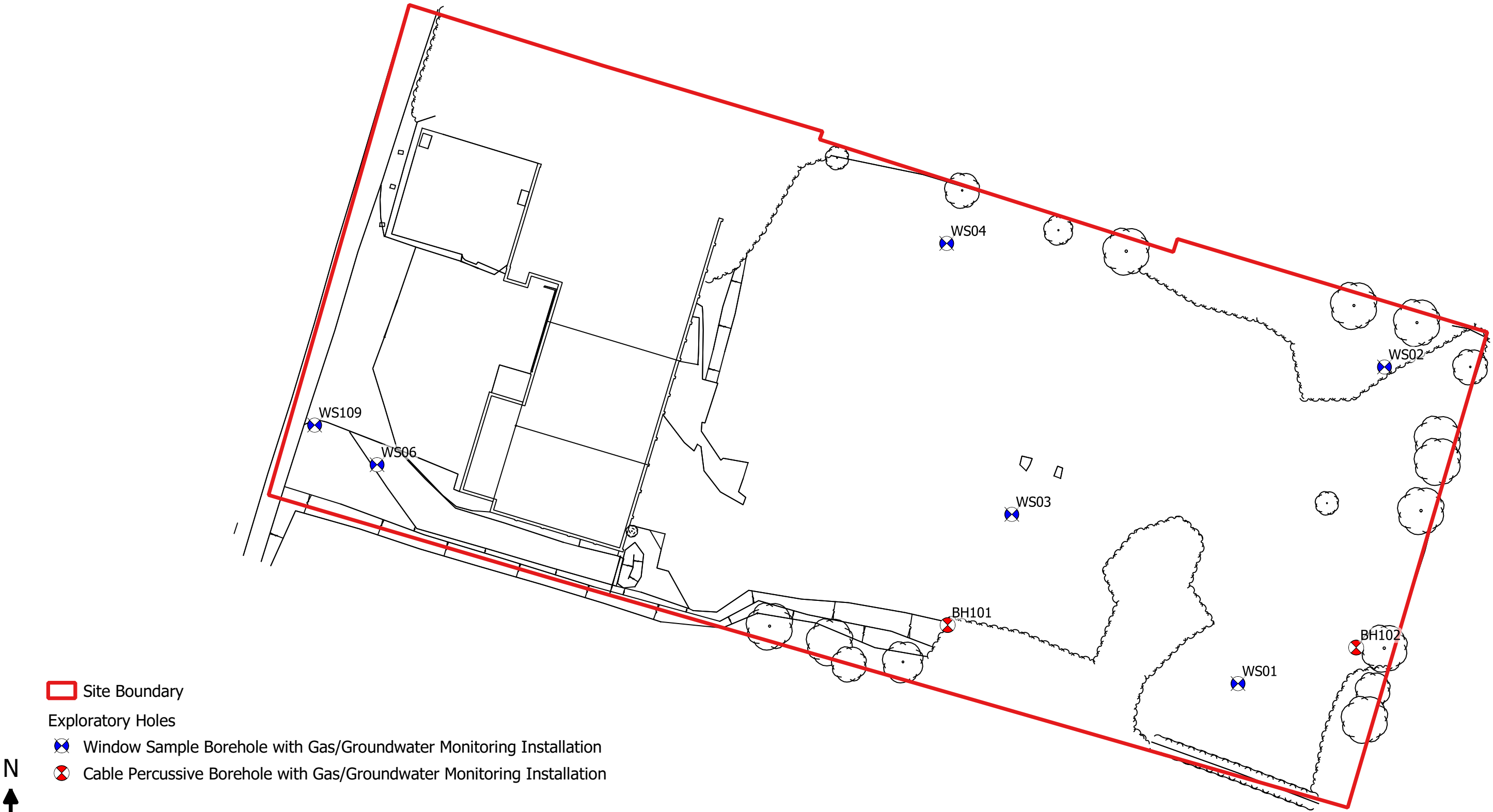
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Site Boundary

Exploratory Holes

Window Sample Borehole with Gas/Groundwater Monitoring Installation

Cable Percussive Borehole with Gas/Groundwater Monitoring Installation



NOTES:	CLIENT: Partner Construction Ltd & Waterloo Housing Group Ltd		PROJECT No: P8723	DATE: 07/2019	DESIGN/DRAWN: CM
	PROJECT: Crease Drove, Crowland		DRAWING NUMBER: 03		ISSUE: FINAL
	TITLE: Gas and Water Monitoring Plan		© GRM Development Solutions Ltd © Crown Copyright. AL 100014100		
			 GRM Development Solutions Ltd Tel: 01283 551 249 mail@grm-uk.com www.grm-uk.com		



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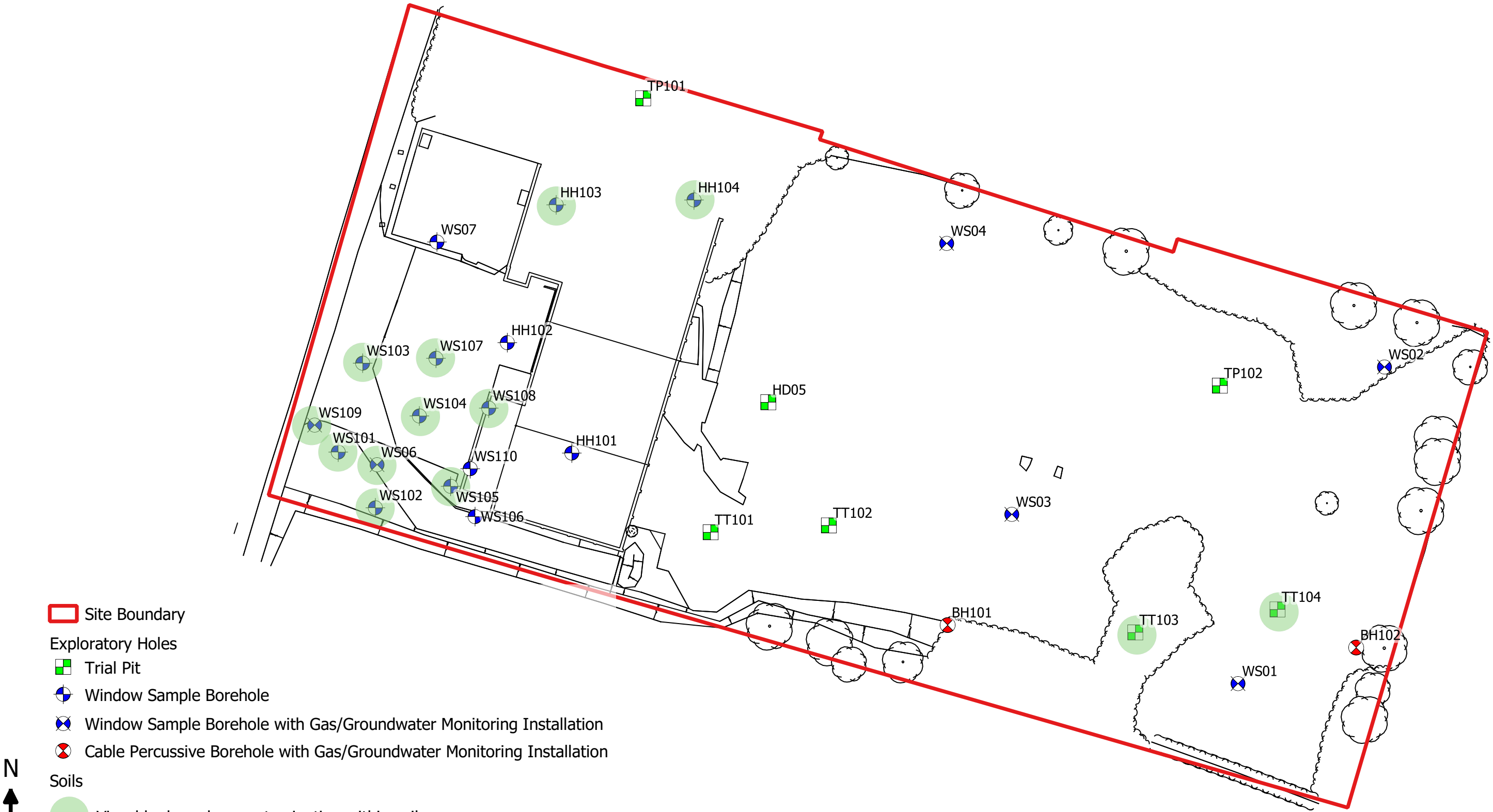
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NOTES:	CLIENT:	Partner Construction Ltd & Waterloo Housing Group Ltd	PROJECT No:	P8723	DATE:	07/2019	DESIGN/DRAWN:	CM	 GRM Development Solutions Ltd Tel: 01283 551 249 mail@grm-uk.com www.grm-uk.com
	PROJECT:	Crease Drove, Crowland	DRAWING NUMBER:	04	ISSUE:	FINAL			
	TITLE:	Exploratory Holes with Visual/Olfactory Contamination	© GRM Development Solutions Ltd © Crown Copyright. AL 100014100						



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Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

GRM Development Solutions

Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L19/1428/GRM/001 - Amendment B

Your Project Reference:	Crease Drove, Crowland	Samples Received on:	07/06/2019
Your Order Number:	P8723	Testing Instruction Received:	07/06/2019
Report Issue Number:	3	Sample Tested:	07/06 to 01/07/2019
Samples Analysed:	17 soil samples	Report issued:	11/07/2019

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and Lol which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results are representative of the material provided

Asbestos

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

Samples were received in suitable containers

Yes - Except samples 39628,39629,39630,39633,39637

A date and time of sampling was provided

Yes

Sample holding times were exceeded prior to analysis of determinants

No

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

WAC Testing

Samples were leached in accordance with BS EN 12457-2: 2002.

Eluate Results are reported as L/S 10. These results have been calculated in accordance with BS EN 12457-2:2002.

Comparative values are taken from the Environment Agency document "Guidance for waste destined for disposal in landfills", Version 2, June 2006.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

J:\Public\Projects\2019\L19\GRM - GRM Development solutions\L19-1428-GRM P8723\L19-1428-GRM-001B.xlsx\Cover Sheet

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Analytical Test Results - Soil

NC Reference			39622	39624	39626	39628	39629	39631	39633
Client Sample Reference			WS101	WS103	WS104	WS106	WS107	WS109	WS110
Client Sample Location			WS101	WS103	WS104	WS106	WS107	WS109	WS110
Depth - Top (m)			0.7	1.3	1.5	1.7	1.1	1.5	1.8
Depth - Bottom (m)			0.8	1.4	1.6	1.8	1.2	1.6	1.9
Date of Sampling			03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019
Time of Sampling			Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Sample Matrix			Clay	Sand	Clay	Other	Clay	Clay	Clay
Determinant	Units	Accreditation							
Arsenic	(mg/kg)	MCERTS	-	36	-	-	-	23	-
Cadmium	(mg/kg)	MCERTS	-	0.9	-	-	-	1.0	-
Chromium (Total)	(mg/kg)	UKAS	-	24	-	-	-	40	-
Copper	(mg/kg)	MCERTS	-	16	-	-	-	26	-
Lead	(mg/kg)	MCERTS	-	20	-	-	-	53	-
Mercury	(mg/kg)	UKAS	-	< 2.5	-	-	-	< 2.5	-
Nickel	(mg/kg)	MCERTS	-	24	-	-	-	33	-
Selenium	(mg/kg)	u	-	< 8.0	-	-	-	< 8.0	-
Zinc	(mg/kg)	MCERTS	-	67	-	-	-	96	-
Total Phenols	(mg/kg)	MCERTS	-	< 1.0	-	-	-	< 1.0	-
Cyanide (Total)	(mg/kg)	MCERTS	-	< 1.0	-	-	-	< 1.0	-
Cyanide (Free)	(mg/kg)	u	-	< 1.0	-	-	-	< 1.0	-
Chromium (Hexavalent)	(mg/kg)	u	-	< 1.0	-	-	-	< 1.0	-
pH	pH Units	MCERTS	-	7.8	-	-	-	6.9	-
Sulphate (Water soluble)	(mg/l)	u	-	130	-	-	-	330	-
SOM (via TOC)	(%)	UKAS	-	< 1.7	-	< 1.7	-	7.5	-
Acenaphthene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	2.4	-
Acenaphthylene	(mg/kg)	UKAS	-	< 0.02	-	-	-	0.51	-
Anthracene	(mg/kg)	UKAS	-	< 0.02	-	-	-	1.0	-
Benzo (a) anthracene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Benzo (a) pyrene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Benzo (b) fluoranthene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Benzo (k) fluoranthene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Chrysene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Fluoranthene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	0.10	-
Fluorene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	1.9	-
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	< 0.04	-
Naphthalene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	0.96	-
Phenanthrene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	5.0	-
Pyrene	(mg/kg)	MCERTS	-	< 0.02	-	-	-	0.10	-
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	-	< 0.32	-	-	-	12	-
Total TPH (>C ₈ to C ₄₀)	(mg/kg)	MCERTS	200	-	690	20	29	-	19
Asbestos	-	UKAS	-	No asbestos detected	-	-	-	No asbestos detected	-

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Analytical Test Results - Soil

NC Reference			39634	39635	39636	39637
Client Sample Reference			HH101	HH102	HH103	HH104
Client Sample Location			HH101	HH102	HH103	HH104
Depth - Top (m)			0.3	0.4	0.9	0.3
Depth - Bottom (m)			0.4	0.5	1.0	0.4
Date of Sampling			05/06/2019	05/06/2019	05/06/2019	05/06/2019
Time of Sampling			Not Provided	Not Provided	Not Provided	Not Provided
Sample Matrix			Sand	Other	Clay	Clay
Determinant	Units	Accreditation				
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10	17
Cadmium	(mg/kg)	MCERTS	0.5	0.2	0.4	0.7
Chromium (Total)	(mg/kg)	UKAS	9.2	< 1.0	18	23
Copper	(mg/kg)	MCERTS	22	14	7.0	6.7
Lead	(mg/kg)	MCERTS	14	3.0	17	20
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	14	2.9	16	23
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	35	11	43	56
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Free)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	8.6	8.6	7.7	7.8
Sulphate (Water soluble)	(mg/l)	u	30	27	< 10	< 10
SOM (via TOC)	(%)	UKAS	< 1.7	< 1.7	< 1.7	< 1.7
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (a) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.02	< 0.02	< 0.02	< 0.02
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Chrysene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.03	< 0.02	< 0.02	< 0.02
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.02	< 0.02	< 0.02	0.03
Pyrene	(mg/kg)	MCERTS	0.03	< 0.02	< 0.02	< 0.02
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.38	< 0.32	< 0.32	0.36
Total TPH (>C ₈ to C ₄₀)	(mg/kg)	MCERTS	-	-	-	-
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Analytical Test Results - TPH CWG

NC Reference			39623	39624	39625	39627	39630	39631	39632
Client Sample Reference			WS102	WS103	WS104	WS105	WS107	WS109	WS109
Client Sample Location			WS102	WS103	WS104	WS105	WS107	WS109	WS109
Depth - Top (m)			2.8	1.3	0.5	1.1	1.8	1.5	2.8
Depth - Bottom (m)			3.0	1.4	0.6	1.2	1.9	1.6	2.9
Date of Sampling			03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019
Time of Sampling			Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Sample Matrix			Clay	Sand	Clay	Clay	Clay	Clay	Sand
Determinant	Units	Accreditation							
Aliphatics									
>C ₅ to C ₆	(mg/kg)	u	0.06	< 0.03	0.14	< 0.03	< 0.03	< 0.41	0.03
>C ₆ to C ₈	(mg/kg)	u	0.23	0.21	0.20	0.24	0.21	2.3	0.24
>C ₈ to C ₁₀	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	18	0.04
>C ₁₀ to C ₁₂	(mg/kg)	u	< 10	< 10	44	< 10	< 10	200	< 10
>C ₁₂ to C ₁₆	(mg/kg)	u	< 10	< 10	320	< 10	< 10	720	< 10
>C ₁₆ to C ₂₁	(mg/kg)	u	< 10	< 10	340	< 10	< 10	590	< 10
>C ₂₁ to C ₃₅	(mg/kg)	u	23	< 10	160	12	14	100	17
Aromatics									
>C ₅ to C ₇	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.41	< 0.03
>C ₇ to C ₈	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.41	< 0.03
>C ₈ to C ₁₀	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.41	< 0.03
>C ₁₀ to C ₁₂	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	93	< 10
>C ₁₂ to C ₁₆	(mg/kg)	u	< 10	< 10	130	< 10	< 10	470	< 10
>C ₁₆ to C ₂₁	(mg/kg)	u	< 10	< 10	230	< 10	< 10	330	< 10
>C ₂₁ to C ₃₅	(mg/kg)	u	18	< 10	120	< 10	20	58	12
Total									
>C ₅ to C ₃₅	(mg/kg)	u	< 50	< 50	1300	< 50	< 50	2600	< 50

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Analytical Test Results - TPH CWG

NC Reference			39634	39635	39636	39637	39638
Client Sample Reference			HH101	HH102	HH103	HH104	HH104
Client Sample Location			HH101	HH102	HH103	HH104	HH104
Depth - Top (m)			0.3	0.4	0.9	0.3	1.3
Depth - Bottom (m)			0.4	0.5	1.0	0.4	1.4
Date of Sampling			05/06/2019	05/06/2019	05/06/2019	05/06/2019	05/06/2019
Time of Sampling			Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Sample Matrix			Sand	Other	Clay	Clay	Sand
Determinant	Units	Accreditation					
Aliphatics							
>C ₅ to C ₆	(mg/kg)	u	< 0.03	< 0.03	< 0.03	0.05	< 0.03
>C ₆ to C ₈	(mg/kg)	u	0.26	0.03	0.07	< 0.03	0.03
>C ₈ to C ₁₀	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	0.45
>C ₁₀ to C ₁₂	(mg/kg)	u	< 10	< 10	< 10	< 10	28
>C ₁₂ to C ₁₆	(mg/kg)	u	< 10	< 10	< 10	< 10	150
>C ₁₆ to C ₂₁	(mg/kg)	u	< 10	< 10	< 10	< 10	130
>C ₂₁ to C ₃₅	(mg/kg)	u	14	14	18	18	49
Aromatics							
>C ₅ to C ₇	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
>C ₇ to C ₈	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
>C ₈ to C ₁₀	(mg/kg)	u	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
>C ₁₀ to C ₁₂	(mg/kg)	u	< 10	< 10	< 10	< 10	13
>C ₁₂ to C ₁₆	(mg/kg)	u	< 10	< 10	< 10	< 10	83
>C ₁₆ to C ₂₁	(mg/kg)	u	< 10	< 10	< 10	< 10	84
>C ₂₁ to C ₃₅	(mg/kg)	u	16	< 10	16	19	33
Total							
>C ₅ to C ₃₅	(mg/kg)	u	< 50	< 50	< 50	< 50	570

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Certificate Of Analysis - WAC Suite

NC Reference	39624
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Client Sample Reference	WS103
Client Sample Location	WS103
Depth - Top (m)	1.30
Depth - Bottom (m)	1.40
Date of Sampling	03/06/2019
Time of Sampling	Not Provided
Sample Description	Orangish brown gravelly silty sand
Sample Matrix	Sand
Moisture Content (%)	14
Stone content (%)	13

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	< 1.0	3.0	5.0	6.0
Loss on Ignition	%	UKAS	0.6	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.22	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀)	mg/kg	u	18	500	-	-
PAH	mg/kg	u	< 0.34	100	-	-
pH	units	MCERTS	7.8	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.02	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	< 1	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	190	1000	20000	50000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	94	500	800	1000

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Certificate Of Analysis - WAC Suite

NC Reference	39631
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Client Sample Reference	WS109
Client Sample Location	WS109
Depth - Top (m)	1.50
Depth - Bottom (m)	1.60
Date of Sampling	03/06/2019
Time of Sampling	Not Provided
Sample Description	Dark brown slightly sandy slightly gravelly silty clay with frequent hydrocarbons
Sample Matrix	Clay
Moisture Content (%)	64
Stone content (%)	1.6

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	4.4	3.0	5.0	6.0
Loss on Ignition	%	UKAS	13	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.056	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀)	mg/kg	u	6500	500	-	-
PAH	mg/kg	u	13	100	-	-
pH	units	MCERTS	6.9	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.03	0.50	2	25
Barium	mg/kg	u	0.30	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.02	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	0.04	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	6	800	15000	25000
Fluoride	mg/kg	u	5	10	150	500
Sulphate (as SO ₄)	mg/kg	u	54	1000	20000	50000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	470	500	800	1000



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Leicester
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Project Reference - Crease Drove, Crowland

Certificate Of Analysis - WAC Suite

NC Reference	39635
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Client Sample Reference	HH102
Client Sample Location	HH102
Depth - Top (m)	0.40
Depth - Bottom (m)	0.50
Date of Sampling	05/06/2019
Time of Sampling	Not Provided
Sample Description	Light brown crushed rock
Sample Matrix	Other
Moisture Content (%)	8.9
Stone content (%)	0

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	< 1.0	3.0	5.0	6.0
Loss on Ignition	%	UKAS	0.7	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.21	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀)	mg/kg	u	45	500	-	-
PAH	mg/kg	u	< 0.34	100	-	-
pH	units	MCERTS	8.6	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.02	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	2	800	15000	25000
Fluoride	mg/kg	u	2	10	150	500
Sulphate (as SO ₄)	mg/kg	u	83	1000	20000	50000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	100	500	800	1000



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L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Sample Descriptions

NC Reference	Client Sample Reference	Sample Location	Description	Moisture Content (%)	Stone Content (%)
39622	WS101	WS101	Dark brown slightly sandy silty clay	43	0.0
39623	WS102	WS102	Mottled greyish brown slightly sandy slightly gravelly silty clay	23	0.0
39624	WS103	WS102	Orangish brown gravelly silty sand	14	13
39625	WS104	WS104	Mottled greyish brown slightly sandy silty clay	52	2.2
39626	WS104	WS104	Mottled greyish brown sandy slightly gravelly silty clay	16	11
39627	WS105	WS105	Orangish brown slightly sandy slightly gravelly silty clay	19	12
39628	WS106	WS106	Orangish brown sandy crushed rock	8.4	31
39629	WS107	WS107	Mottled greyish brown slightly sandy silty clay	21	6.6
39630	WS107	WS107	Mottled greyish brown slightly sandy slightly gravelly silty clay	14	1.3
39631	WS109	WS109	Dark brown slightly sandy slightly gravelly silty clay with frequent hydrocarbons	64	1.6
39632	WS109	WS109	Orangish brown gravelly silty sand	11	19
39633	WS110	WS110	Mottled greyish brown slightly sandy slightly gravelly silty clay	17	8.9
39634	HH101	HH101	Brown very gravelly silty sand	13	40
39635	HH102	HH102	Light brown crushed rock	8.9	0.0
39636	HH103	HH103	Mottled brownish grey slightly sandy silty clay	14	1.3
39637	HH104	HH104	Dark brown slightly sandy slightly gravelly silty clay	13	9.7
39638	HH104	HH104	Brown slightly gravelly silty sand with rare hydrocarbons	16	0.0

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Sample Comments

NC Reference	Client Sample Reference	Sample Location	Comments
39622	WS101	WS101	-
39623	WS102	WS102	VPH - Sample taken from container with headspace.
39624	WS103	WS103	VOC/BTEX - Sample taken from container with headspace.
39625	WS104	WS104	-
39626	WS104	WS104	-
39627	WS105	WS105	VPH - Sample taken from container with headspace.
39628	WS106	WS106	-
39629	WS107	WS107	-
39630	WS107	WS107	VPH - Sample taken from container with headspace.
39631	WS109	WS109	VPH - Sample taken from container with headspace.
39632	WS109	WS109	-
39633	WS110	WS110	-
39634	HH101	HH101	-
39635	HH102	HH102	VOC/BTEX - Sample taken from container with headspace.
39636	HH103	HH103	-
39637	HH104	HH104	VPH - Sample taken from container with headspace.
39638	HH104	HH104	-

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	Metals	Air Dried	In house method statement - MS - CL - ICP metals
Soil	PAH	As Received	In house method statement - MS - CL - PAH (As received)
Soil	Phenols	As Received	In house method statement - MS - CL - Phenols by Skalar
Soil	Chromium (hexavalent)	As Received	In house method statement - MS - CL - Hexavalent Chromium by Skalar
Soil	Cyanide	As Received	In house method statement - MS - CL - Cyanide by Skalar
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	SOM	Air Dried	In house method statement - MS - CL - TOC Eltra
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Total TPH	As Received	In house method statement - MS - CL - TPH (GC-FID)- Sample was not subject to a 'scrubbing' cleanup step prior to analysis
Soil	CWG	As Received	In house method statements - MS - CL - EPH in soil and MS - CL - VPH
Soil	Asbestos	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"

L19/1428/GRM/001 - Amendment B

Project Reference - Crease Drove, Crowland

WAC Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	TOC	Air Dried	In house method statement - MS - CL - TOC Eltra
Soil	Lol	Oven Dried	Testing was in accordance with BS 1377: Part 3: 1990 Clause 4. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.
Soil	BTEX	As Received	In house method statement - MS - CL - VOC and MBTEX
Soil	PCB	As Received	In house method statement - MS - CL - PCB
Soil	Mineral Oil	As Received	In house method statement - MS - CL - TPH (GC-FID)
Soil	PAH	As Received	In house method statement - MS - CL - PAH (As received)
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Eluate	Metals	Leached	In house method statement - MS - CL - ICP Waters
Eluate	Anions	Leached	In house method statement - MS - CL - Anions by Aquakem
Eluate	Phenol Index	Leached	In house method statement - MS - CL - Phenols (Skalar)
Eluate	DOC	Leached	In house method statement - MS - CL - DOC



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GRM Development Solutions

Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L19/1450/GRM/001

Your Project Reference:	Crease Drove, Crowland	Samples Received on:	11 & 18/06/2019
Your Order Number:	P8723	Testing Instruction Received:	11 & 18/06/2019
Report Issue Number:	1	Sample Tested:	18 to 26/06/2019
Samples Analysed:	3 soil samples	Report issued:	02/07/2019

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results are representative of the material provided

Deviating Samples

Samples were received in suitable containers **Yes**

A date and time of sampling was provided **Yes**

Sample holding times were exceeded prior to analysis of determinants **Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

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L19/1450/GRM/001

Project Reference - Crease Drove, Crowland

Analytical Test Results - BRE Suite

NC Reference			40325	40787	40326
Client Sample Reference			CP101	CP101	CP102
Client Sample Location			CP101	CP101	CP102
Depth - Top (m)			2.3	4.00	5.0
Depth - Bottom (m)			2.3	4.00	5.0
Date of Sampling			04/06/2019	04/06/2019	05/06/2019
Time of Sampling					
Sample Matrix			Clay	Clay	Clay
Determinant	Units	Accreditation			
Water soluble sulphate	(mg/l)	u	310	330	300
Acid Soluble Sulphate	(%)	u	0.23	0.22	0.17
Total Sulphur	(%)	u	0.63	0.99	0.68
pH Value	pH Units	MCERTS	8.8	8.7	9.4



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L19/1450/GRM/001

Project Reference - Crease Drove, Crowland

Sample Descriptions

NC Reference	Client Sample Reference	Sample Location	Description	Passing 2mm test sieve (%)
40325	CP101	CP101	Grey slightly gravelly silty clay	100
40787	CP101	CP101	Brownish grey slightly gravelly silty clay with rare chalk	100
40326	CP102	CP102	Grey slightly sandy silty clay	100

L19/1450/GRM/001

Project Reference - Crease Drove, Crowland

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	Metals	Air Dried	In house method statement - MS - CL - ICP metals
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate

GRM Development Solutions

Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L19/1516/GRM/001

Your Project Reference:	Crease Drove Crowland	Samples Received on:	20/06/2019
Your Order Number:	P8723	Testing Instruction Received:	20/06/2019
Report Issue Number:	1	Sample Tested:	20/06 to 10/07/2019
Samples Analysed:	6 water samples	Report issued:	10/07/2019

Signed



Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Samples were supplied by customer, results are representative of the material provided

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

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L19/1516/GRM/001

Project Reference - Crease Drove Crowland

Analytical Test Results - GRM Water Suite

NC Reference			41002	41003	41004	41005
Client Sample Reference			WS01	WS03	WS04	WS06
Client Sample Location			WS01	WS03	WS04	WS06
Depth - Top (m)			Not provided	Not provided	Not provided	Not provided
Depth - Bottom (m)			Not provided	Not provided	Not provided	Not provided
Date of Sampling			18/06/2019	18/06/2019	18/06/2019	18/06/2019
Time of Sampling			Not provided	Not provided	Not provided	Not provided
Sample Matrix			Water	Water	Water	Water
Determinant	Units	Accreditation				
Arsenic (dissolved)	(µg/l)	u	< 3	< 3	< 3	7
Cadmium (dissolved)	(µg/l)	u	< 3	< 3	< 3	< 3
Chromium (dissolved)	(µg/l)	u	< 3	< 3	< 3	< 3
Copper (dissolved)	(µg/l)	u	< 1	< 1	< 1	< 1
Iron (dissolved)	(µg/l)	u	76	< 10	< 10	8900
Lead (dissolved)	(µg/l)	u	< 5	< 5	< 5	< 5
Mercury (dissolved)	(µg/l)	u	< 1	< 1	< 1	< 1
Nickel (dissolved)	(µg/l)	u	39	< 3	< 3	9
Selenium (dissolved)	(µg/l)	u	< 1	< 1	< 1	< 1
Zinc (dissolved)	(µg/l)	u	< 5	< 5	< 5	< 5
Phenol (Total)	(µg/l)	u	< 0.80	< 0.80	< 0.80	< 0.80
Cyanide (Total)	(mg/l)	u	< 1	< 1	< 1	< 1
pH	pH Units	u	5.0	6.8	7.2	6.9
Chloride	(mg/l)	u	28	28	58	15
Sulphate (as SO ₄)	(mg/l)	u	1200	820	580	54
Ammonical Nitrogen (as N)	(mg/l)	u	0.028	0.83	0.13	2.8
Hardness (as CaCO ₃)	(mg/l)	u	770	680	520	210
Benzo (a) pyrene	(µg/l)	u	< 0.01	0.02	< 0.01	0.02
Benzo (b) fluoranthene	(µg/l)	u	< 0.01	< 0.01	0.01	0.01
Benzo (g, h, i) perylene	(µg/l)	u	< 0.01	0.01	< 0.01	0.01
Benzo (k) fluoranthene	(µg/l)	u	< 0.01	0.02	< 0.01	0.02
Indeno (1, 2, 3,-cd) pyrene	(µg/l)	u	< 0.01	0.02	< 0.01	0.02
Naphthalene	(µg/l)	u	0.07	< 0.01	< 0.01	0.04

L19/1516/GRM/001

Project Reference - Crease Drove Crowland

Analytical Test Results - TPH CWG Water Samples

NC Reference			41005	41006
Client Sample Reference			WS06	WS109
Client Sample Location			WS06	WS109
Depth - Top (m)			Not provided	Not provided
Depth - Bottom (m)			Not provided	Not provided
Date of Sampling			18/06/2019	18/06/2019
Time of Sampling			Not provided	Not provided
Sample Matrix			Water	Water
Determinant	Units	Accreditation		
Aliphatics				
>C ₅ to C ₆	(µg/l)	u	< 0.10	< 0.10
>C ₆ to C ₈	(µg/l)	u	< 0.10	< 0.10
>C ₈ to C ₁₀	(µg/l)	u	< 0.10	< 0.10
>C ₁₀ to C ₁₂	(µg/l)	u	< 5.00	< 5.00
>C ₁₂ to C ₁₆	(µg/l)	u	< 10.00	< 10.00
>C ₁₆ to C ₂₁	(µg/l)	u	< 10.00	< 10.00
>C ₂₁ to C ₃₅	(µg/l)	u	< 15.00	< 15.00
Aromatics				
>C ₅ to C ₇	(µg/l)	u	< 0.10	< 0.10
>C ₇ to C ₈	(µg/l)	u	< 0.10	< 0.10
>C ₈ to C ₁₀	(µg/l)	u	0.62	< 0.10
>C ₁₀ to C ₁₂	(µg/l)	u	< 5.00	< 5.00
>C ₁₂ to C ₁₆	(µg/l)	u	< 10.00	< 10.00
>C ₁₆ to C ₂₁	(µg/l)	u	< 10.00	< 10.00
>C ₂₁ to C ₃₅	(µg/l)	u	112	< 15.00
Total				
>C ₅ to C ₃₅	(µg/l)	u	110	< 30

L19/1516/GRM/001

Project Reference - Crease Drove Crowland

Analytical Test Results - VOC

NC Reference			41002	41003	41004	41005
Client Sample Reference			WS01	WS03	WS04	WS06
Client Sample Location			WS01	WS03	WS04	WS06
Depth - Top (m)			Not provided	Not provided	Not provided	Not provided
Depth - Bottom (m)			Not provided	Not provided	Not provided	Not provided
Date of Sampling			18/06/2019	18/06/2019	18/06/2019	18/06/2019
Time of Sampling			Not provided	Not provided	Not provided	Not provided
Sample Matrix			Water	Water	Water	Water
Determinant	Units	Accreditation				
Benzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Toluene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Ethylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
m&p Xylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
o-Xylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Dichlorodifluoromethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Chloromethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Vinyl Chloride	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Bromomethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Chloroethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Trichlorofluoromethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,1-Dichloroethylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Dichloromethane	(µg/l)	u	21.0	22.8	23.6	21.5
MTBE	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
trans-1,2,-dichloroethylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,1-Dichloroethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
2,2-Dichloropropane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
cis--1,2,-dichloroethylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Bromochloromethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Chloroform (Trichloromethane)	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,1,1-Trichloroethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,1-Dichloropropene	(µg/l)	u	< 6.00	< 6.00	< 6.00	20.8
Carbon Tetrachloride	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2-dichloroethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Trichloroethylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2-Dichloropropane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Dibromomethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Bromodichloromethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
cis-1,2-dichloropropylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
trans-1,3-dichloropropylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,1,2-Trichloroethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,3-Dichloropropane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Tetrachloroethylene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Chlorodibromomethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2-Dibromoethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Chlorobenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,1,1,2-tetrachloroethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Styrene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Isopropylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Bromoform	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,1,2,2-Tetrachloroethane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2,3-Trichloropropane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
n-Propylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Bromobenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,3,5-Trimethylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
2-chlorotoluene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
4-chlorotoluene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
tert-butylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2,4-trimethylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
sec-Butylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
4-Isopropyltoluene (P-Cymene)	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,3-Dichlorobenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,4-Dichlorobenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
n-Butylbenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2-Dichlorobenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2-Dibromo-3-chloropropane	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2,4-Trichlorobenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Hexachlorobutadiene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
Naphthalene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00
1,2,3-Trichlorobenzene	(µg/l)	u	< 6.00	< 6.00	< 6.00	< 6.00

L19/1516/GRM/001

Project Reference - Crease Drove Crowland

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Water	Metals	As Received	In house method statement - MS - CL - ICP Waters
Water	PAH	As Received	In house method statement - MS - CL - PAH in Waters
Water	Phenols	As Received	In house method statement - MS - CL - Phenol waters by HPLC
Water	pH	As Received	BS 1377, Part 3, 1990
Water	Cyanide	As Received	In house method statement - MS - CL - Cyanide
Water	Sulphate	As Received	In house method statement - MS - CL - Anions by Aquakem
Water	Chloride	As Received	In house method statement - MS - CL - Anions by Aquakem
Water	Hardness	As Received	In house method statement - MS - CL - ICP Waters
Water	Ammonical Nitrogen	As Received	In house method statement - MS - CL - Anions by Aquakem
Water	CWG	As Received	In house method statement - MS - CL - VPH and EPH Waters
Water	VOC	As Received	In house method statement - MS - CL - VOC and MBTEX



A P P E N D I X H

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GRM Development Solutions

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DE14 2WH

Analytical Test Report: L19/1450/GRM/002

Your Project Reference:	Crease Drove, Crowland	Samples Received on:	11/06/2019
Your Order Number:	P8723	Testing Instruction Received:	11/06/2019
Report Issue Number:	1	Sample Tested:	11/06 to 01/07/2019
Samples Analysed:	15 soil samples	Report issued:	02/07/2019

Signed

Lee Harbottle
GCM Operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.
The results included within the report are representative of the samples submitted for analysis.
A certificate of sampling was not supplied.
Samples were provided by client

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.
Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.
Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Determination of Undrained Shear Strength in Triaxial Compression

Sample preparation was in accordance with BS1377:Part 1:2016.
Testing was in accordance with BS 1377: Part 7: 1990 clause 8, single stage loading.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 24.01.2017

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

J:\Public\Projects\2019\L19\GRM - GRM Development solutions\L19-1450-GRM P8723\L19-1450-GRM-001.xlsx\Cover Sheet



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L19/1450/GRM/002

Project Reference - Crease Drove, Crowland

Analytical Test Results - Soil

NC Reference			40311	40315	40320	40321
Client Sample Reference			CP101	CP102	TP101	TP102
Client Sample Location			CP101	CP102	TP101	TP102
Depth - Top (m)			4.0	1.5	0.5	0.4
Depth - Bottom (m)			4.0	1.5	0.6	0.5
Date of Sampling			04/06/2019	05/06/2019	04/06/2019	04/06/2019
Sample type			Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Grey stiff silty clay	Brown slightly gravelly slightly silty slightly sandy clay with occasional organic matter	Brown slightly gravelly slightly silty slightly sandy clay	Brown gravelly sandy clay
Determinant	Specification	Units				
Moisture Content		(%)	22	22	18	15
Moisture Content Prep		-	3.2.3.1 (fine)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)
Fines passing 425µm test sieve		(%)	100	92	91	83
Liquid Limit		(%)	51	42	32	32
Plastic Limit		(%)	17	18	15	15
Plasticity Index		(%)	34	24	17	17
PI preparation		-	from its natural state	from its natural state	from its natural state	from its natural state
PI Test Method			clause 4.4 (one point)	clause 4.4 (one point)	clause 4.4 (one point)	clause 4.4 (one point)

L19/1450/GRM/002

Project Reference - Crease Drove, Crowland

Analytical Test Results -

Triaxial (Single Stage)

NC Reference		40311	40312	40313	40314	40316	40317
Client Sample Reference		CP101	CP101	CP101	CP101	CP102	CP102
Client Sample Location		CP101	CP101	CP101	CP101	CP102	CP102
Depth - Top (m)		4.0	6.5	9.5	12.5	5.0	8.0
Depth - Bottom (m)		4.0	6.5	9.5	12.5	5.0	8.0
Date of Sampling		04/06/2019	04/06/2019	04/06/2019	04/06/2019	05/06/2019	05/06/2019
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Grey stiff silty clay	Very stiff grey silty clay	Very stiff silty clay	Very stiff grey clay	Stiff grey silty clay	Very stiff grey silty clay
Determinant	Units						
Preparation Method		undisturbed	undisturbed	undisturbed	undisturbed	undisturbed	undisturbed
Orientation within original sample		Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Depth within original sample	mm	20	15	22	20	15	22
Initial Properties							
Sample height	mm	208	208	208	208	208	208
Sample width	mm	103	103	103	103	103	103
Moisture content	%	22	21	23	23	22	19
Bulk density	Mg/m ³	2.10	2.10	2.13	2.11	2.10	2.18
Dry density	Mg/m ³	1.72	1.74	1.74	1.72	1.73	1.83
Rate of strain	%/min	0.56	0.66	0.65	0.75	0.59	0.52
Type of membrane	-	Latex	Latex	Latex	Latex	Latex	Latex
Membrane thickness	mm	0.34	0.34	0.34	0.34	0.34	0.34
Test Data							
Cell pressure	kPa	80	130	180	240	100	160
Maximum deviator stress	kPa	166	331	257	269	216	320
Membrane correction	kPa	0.6	0.6	0.3	0.6	0.9	0.6
Corrected maximum deviator stress	kPa	165	330	256	268	215	319
Cumulative strain at failure	%	8.17	9.62	7.21	10.6	14.4	10.6
Mode of failure	-	brittle	brittle	brittle	brittle	plastic	intermediate
Shear strength (c _u)	kPa	83	165	128	134	108	160

L19/1450/GRM/002

Project Reference - Crease Drove, Cr

Analytical Test Results -
Triaxial (Single Stage)

NC Reference		40318	40319	40324
Client Sample Reference		CP102	CP102	BH1 B4
Client Sample Location		CP102	CP102	BH1 B4
Depth - Top (m)		11.0	14.5	2.0
Depth - Bottom (m)		11.0	14.5	2.5
Date of Sampling		05/06/2019	05/06/2019	04/06/2019
Sample type		Disturbed	Disturbed	Disturbed
Sample Description		Very stiff grey silty clay	Very stiff grey silty clay	-
Determinant	Units			
Preparation Method		undisturbed	undisturbed	U/S
Orientation within original sample		Vertical	Vertical	U/S
Depth within original sample	mm	20	25	U/S
Initial Properties				
Sample height	mm	208	208	U/S
Sample width	mm	103	103	U/S
Moisture content	%	20	21	U/S
Bulk density	Mg/m ³	2.10	2.21	U/S
Dry density	Mg/m ³	1.75	1.82	U/S
Rate of strain	%/min	0.67	0.68	U/S
Type of membrane	-	Latex	Latex	U/S
Membrane thickness	mm	0.34	0.34	U/S
Test Data				
Cell pressure	kPa	210	280	U/S
Maximum deviator stress	kPa	317	390	U/S
Membrane correction	kPa	0.3	0.6	U/S
Corrected maximum deviator stress	kPa	316	389	U/S
Cumulative strain at failure	%	6.25	8.65	U/S
Mode of failure	-	brittle	brittle	U/S
Shear strength (c _u)	kPa	158	195	U/S

L19/1450/GRM/002

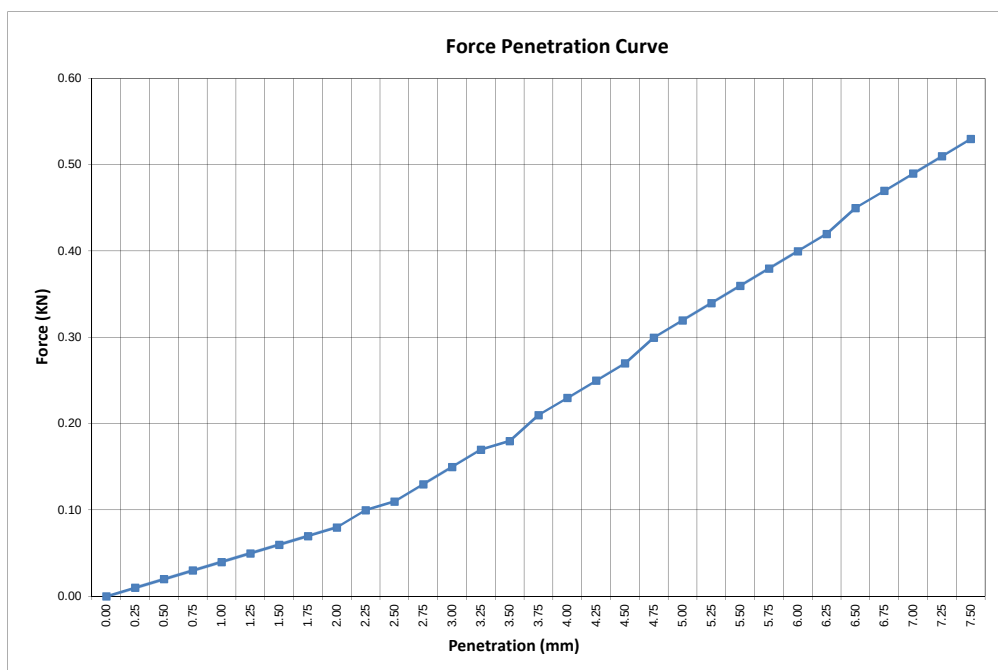
Project Reference - Crease Drove, Crowland

Test Result - BS 1377 Laboratory CBR value - Top only

NC Reference

40321

Client reference :	TP102	Location:	TP102
Sample Depth - Top (m):	0.4	Sample Depth - Bottom (m):	0.5
Visual description :	Light brown silty sandy gravelly clay		
Sample type:	Disturbed		
Initial Bulk Density (Mg/m3) :	2.16	Initial Dry Density (Mg/m3) :	1.88
Material retained on 20mm test sieve (%) :	2.2	Moisture content (%) :	15
California Bearing Ratio (CBR) % :	1.6		



NOTES :

1. Testing was in accordance with BS 1377 : Part 4 : 1990 : Clause 7.
2. Sample preparation was in accordance with cl.7.2.4.4 method 5 2.5kg rammer
3. The test specimen was not soaked prior to testing

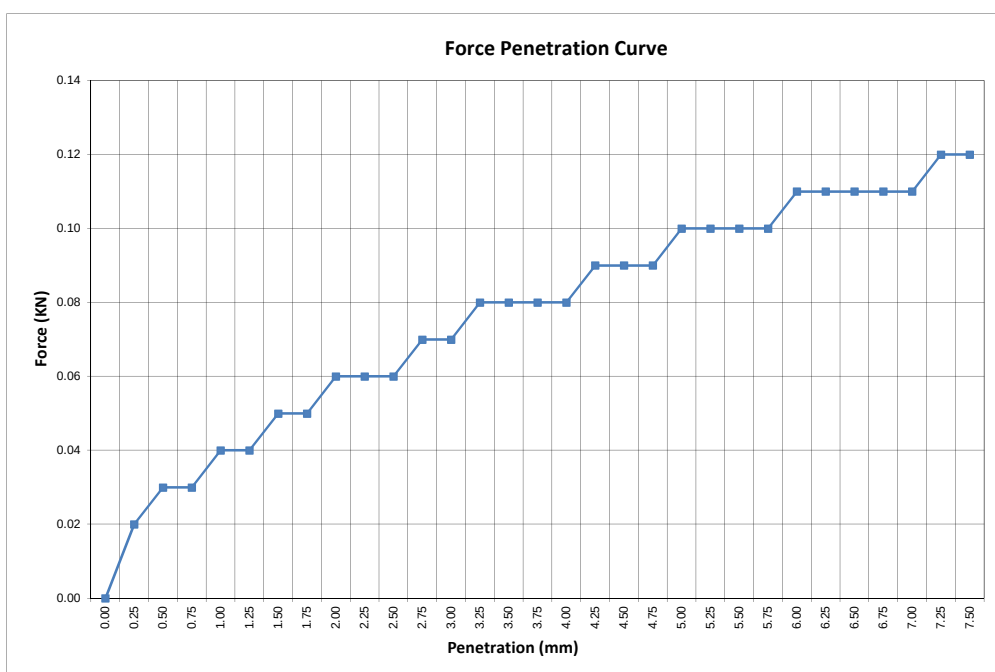
L19/1450/GRM/002

Project Reference - Crease Drove, Crowland

Test Result - BS 1377 Laboratory CBR value - Top only

NC Reference	40322
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Client reference :	TT104-S	Location:	TT104-S
Sample Depth - Top (m):	0.5	Sample Depth - Bottom (m):	0.6
Visual description :	Grey brown silty peaty clay with roots		
Sample type:	Disturbed		
Initial Bulk Density (Mg/m3) :	1.5	Initial Dry Density (Mg/m3) :	0.86
Material retained on 20mm test sieve (%) :	0	Moisture content (%) :	75
California Bearing Ratio (CBR) % :	0.5		



NOTES :

1. Testing was in accordance with BS 1377 : Part 4 : 1990 : Clause 7.
2. Sample preparation was in accordance with cl.7.2.4.4 method 5 2.5kg rammer
3. The test specimen was not soaked prior to testing

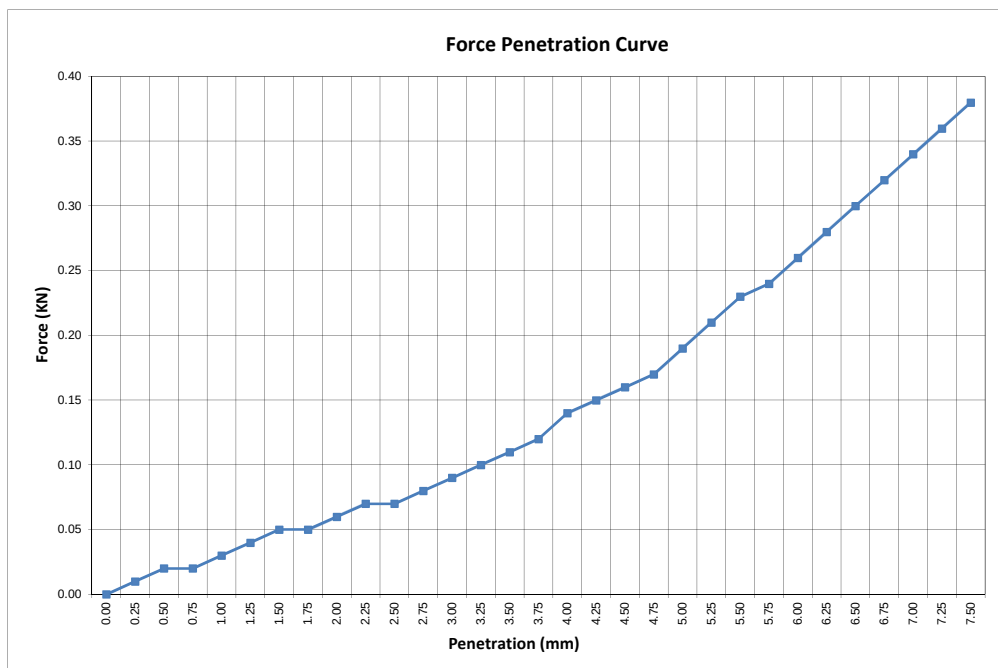
L19/1450/GRM/002

Project Reference - Crease Drove, Crowland

Test Result - BS 1377 Laboratory CBR value - Top only

NC Reference	40323
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Client reference :	TT01-N	Location:	TT01-N
Sample Depth - Top (m):	1	Sample Depth - Bottom (m):	1.1
Visual description :	Light brown silty sandy clayey gravel		
Sample type:	Disturbed		
Initial Bulk Density (Mg/m3) :	2.3	Initial Dry Density (Mg/m3) :	2.07
Material retained on 20mm test sieve (%) :	2.5	Moisture content (%) :	11
California Bearing Ratio (CBR) % :	1.0		



NOTES :

1. Testing was in accordance with BS 1377 : Part 4 : 1990 : Clause 7.
2. Sample preparation was in accordance with cl.7.2.4.4 method 5 2.5kg rammer
3. The test specimen was not soaked prior to testing



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	GRM TIER 1 ASSESSMENT CRITERIA		
LAND USE	Residential with Plant Uptake		
CONTAMINANT	1%	2.50%	6%
^e Arsenic	37	37	37
^e Cadmium	26	26	26
^b Chromium III	2590	2590	2590
^e Chromium VI	21	21	21
^e Lead	200	200	200
^c Mercury	170	170	170
^a Selenium	350	350	350
^a Nickel	130	130	130
^b Phenols	240	471	951
^b Copper	2300	2300	2300
^b Zinc	4590	4590	4590
^d Cyanide	34	34	34
^e Benzene	0.20	0.36	0.87
^b Toluene	118	267	609
^b Ethylbenzene	64	151	349
^b o - xylene	43	101	235
^b m - xylene	41	98	228
^b p - xylene	40	93	217
Non Genotoxic PAHs			
^b Acenaphthene	333	746	1450
^b Acenaphthylene	170	407	906
^b Anthracene	3770	7890	13700
^b Fluoranthene	391	690	981
^b Fluorene	166	939	849
^b Naphthalene	1.5	3.5	8.2
^b Phenanthrene	149	316	558
^b Pyrene	867	1560	2270
Genotoxic PAHs			
^{e/f} Benzo(a)pyrene	5	5	5
ALIPHATIC HYDROCARBONS			
^b C5-C6	28	51	105
^b C6-C8	68	152	347
^b C8-C10	18	43	102
^b C10-C12	87	215	509
^b C12-C16	709	1680	3400
^b C16-35	128000	128000	128000
AROMATIC HYDROCARBONS			
^b C5-7 (benzene)	64	128	271
^b C7-8 (toluene)	118	267	609
^b C8-C10	26	63	146
^b C10-C12	69	165	364
^b C12-C16	141	325	662
^b C16-C21	264	547	938
^b C21-C35	1120	1490	1720

Notes

- a SGV (2009)
- b LQM/CIEH values or derived using CLEAv1.06 with LQM/CIEH Data.
- c SGV for inorganic Hg used (ref.2009 SGV, Pg5, Para.4)
- d Atkins ATRISKsoil Value
- e C4SL - SP1010 (2014)
- f Benzo(a)pyrene is a surrogate marker for the 8 genotoxic PAHs (Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(ah)anthracene, Ideno(1,2,3-cd)pyrene)

NB Where C4SLs/SGVs have not been produced, all TACs have been revised in line with report SP1010 (2014), however, the default consumption rates in the CLEAv1.06 model have been retained.

GRM.TAC.08.14

GRM Controlled Waters Tier 1 Assessment Criteria

Table 1a

UKDWS			EQS freshwater (µg/l)*	EQS other surface water (µg/l)* (Including saline waters)
Parameter	Concentration	Units		
Acrylamide	0.1	µg/l	-	
Aluminium	200	µgAl/l	-	
Ammonium	0.5	mgNH4/l	0.2 as N	0.021 unionised as N
Antimony	5	µgSb/l	-	
Arsenic	10	µgAs/l	50 (dissolved)	25 (dissolved)
Benzene	1	µg/l	10	8
Boron	1	mgB/l	750 [#]	-
Bromate	10	µgBrO3/l	-	-
Cadmium	5	µgCd/l	See Table 2b	0.2
Chromium	50	µgCr/l	-	-
Chromium (III)	-	µg/l	4.7	-
Chromium (VI)	-	µg/l	3.4	0.6
Chloride (i)	250	mgCl/l	188mg/l [#]	
Conductivity (i)	2500	µS/cm at 20°C	-	
Copper(ii)	2	mg/l	1	3.76 (where DOC <1mg/l)
Cyanide	50	µgCN/l	1	1
1, 2 dichloroethane	3	µg/l	10	
Dichloromethane	-	µg/l	20	20
Epichlorohydrin	0.1	µg/l	-	
Fluoride	1.5	mgF/l	1mg/l [#]	
Hydrogen ion	10	pH value	-	
Iron	200	µgFe/l	1000 (dissolved)	1000 (dissolved)
Lead (ii)	10	µgPb/l	1.2 (dissolved & bioavailable)	1.3
Manganese	50	µgMn/l	130 (bioavailable)	-
Mercury	1	µgHg/l	0.07 (dissolved)	0.07 (dissolved)
Mineral Oil (TPH)	10	µg/l	5000 (total) ****	5000 (total) ****
Nickel (ii)	20	µgNi/l	4 (dissolved & bioavailable)	8.6
Nitrate (iii)	50	mgNO3/l	-	-
Nitrite (iii)	0.5	mgNO2/l	-	-
Phenol	0.5	µg/l	7.7	7.7
Polycyclic Aromatic Hydrocarbons (vii) *	0.1	µg/l	-	-
Fluoranthene	-	µg/l	0.0063	0.0063
Naphthalene	-	µg/l	2	2
Benzo(a)pyrene	0.01	µg/l	0.00017	0.00017
Benzo(b)fluoranthene	-	µg/l	-	-
Benzo(k)fluoranthene	-	µg/l	-	-
Benzo(g,h,i)perylene	-	µg/l	-	-
Indeno(1,2,3-cd)pyrene	-	µg/l	-	-
Anthracene	-	µg/l	0.1	0.1
Selenium	10	µgSe/l	7.5	-
Sodium	200	mgNa/l	150mg/l [#]	-
Sulphate (i)	250	mgSO4/l	188mg/l [#]	-
Tetrachloroethene and Trichloroethene (viii)	10	µg/l	10	10
Tetrachloroethane	-	µg/l	140	-
Tetrachloromethane	3	µg/l	12	12
Toluene	700***	µg/l	74	74
Xylene	500***	µg/l	30 [†]	30 [†]
Ethylbenzene	300***	µg/l	20**	20**
1,1,1-Trichloroethane	-	µg/l	100 [†]	100 [†]
Trichlorobenzenes	-	µg/l	0.4	0.4
Trichloromethane	-	µg/l	2.5	2.5
Tributyltin	-	µg/l	0.0002	0.0002
Vinyl chloride	0.5	µg/l	-	-
Carbon Tetrachloride	-	µg/l	12	12
Zinc	5000	µg/l	10.9 (dissolved & bioavailable) + background concentration	6.8 (dissolved & bioavailable) + 1.1

Table 1b

Pesticides			EQS freshwater (µg/l)*	EQS other surface water (µg/l)* (Including saline waters)
Aldrin	0.03	µg/l	-	
Dieldrin	0.03	µg/l	-	-
Heptachlor	0.03	µg/l	-	-
Heptachlor epoxide	0.03	µg/l	-	-
other pesticides	0.1	µg/l	-	-
Cyclodiene pesticides: Sum of Aldrin, Dieldrin, Endrin & Isodrin	-	µg/l	0.01 (sum)	0.005
DDT total	-		0.025	0.025
Pesticides: Total (vi)	0.5	µg/l	-	-

Table 2

EQS for Hardness Related Substances*						
EQS (µg/l) for hardness classes (mg/l CaCO ₃)						
Substance	EQS Type	Class 1: <40	Class 2: 40-50	Class 3: 50-100	Class 4: 100-200	Class 5: >200
Cadmium (dissolved)	Annual average	<0.08	0.08	0.09	0.15	0.25

Reference

* The Water Framework Directive (Standards and Classification) Directions (England and Wales) Directions 2015

** Provisional EQS Value

*** WHO Drinking Water Standard

**** EA PPG3

[†] The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010 - Now Withdrawn

[#] Groundwater Drinking Water Protected Zones Only

Ambient Background Concentrations for dissolved zinc in freshwaters in England and Wales (to be used in conjunction with Table 1a)	
Catchment/Group of catchments ⁽ⁱⁱ⁾	ABC (µg/l)
Tyne	4.8
Tees	4.1
Ouse, Humber	2.9
Nene	4.0
Great Ouse	3.1
River Stour	3.0
Blackwater/Chelmer	3.6
Lee	3.3
Thames	2.0
Test	2.0
Avon/Hants	3.1
Exe	1.4
Dart	1.7
Clywd/Conwy	2.0
Dee	2.9
Eden	1.2
Anglesey	3.0
Tamar	2.9
Fal	5.8
Camel	7.1
Tone/Parrett	3.3
Frome, Bristol Avon	2.3
Wye	2.0
Usk	2.2
Taff	2.8
Neath	2.8
Loughar	3.9
Tywi	2.0
Teifi	2.5
Rheidol/Ystwyth	4.1
Dovey	3.2
Glaslyn	2.6
All other freshwaters not listed above	1.4



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In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction
 Date: 20/12/2018
 Weather: Raining
 Atmospheric Pressure (mb): 1001
 Pressure Trend: Rising
 Equipment: Gas Data GFM430
 Operator: Tom Robson

Ground Gases													
				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	0.50	3.00	NS	0.00	0.00	2.10	2.10	18.20	18.20	0.00	0.00	Not Recorded	
WS02	0.60	1.60	NS	0.00	0.00	3.90	3.90	15.60	15.60	0.00	0.00	Not Recorded	
WS03	1.00	3.00	NS	0.00	0.00	0.90	0.90	19.40	19.40	0.00	0.00	Not Recorded	
WS04	0.50	1.50	NS	0.00	0.00	0.30	0.30	19.80	19.80	0.00	0.00	Not Recorded	
WS06	1.00	2.00	NS	0.00	0.00	0.30	0.30	19.70	19.70	0.00	0.00	Not Recorded	

Ground Waters	
Depth to Groundwater mbegl	Total Well Depth mbegl
1.09	2.94
0.75	1.65
0.50	3.20
0.39	1.43
0.93	2.09

Comments: All holes bailed.

Notes

L.E.L. Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
 N.D. Not Detected
 N.R. Not Recorded
 PID Photo-Ionising Detector
 % By volume

Highlighted cell for following conditions:
 a Methane =>1% v/v
 b Carbon Dioxide =>5% v/v
 MG Made Ground
 NS Natural Strata

Ground Material Key

NS Natural Strata



In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction
 Date: 02/01/2019
 Weather: Cloudy
 Atmospheric Pressure (mb): 1044
 Pressure Trend: Falling
 Equipment: Gas Data GFM430
 Operator: Tom Robson

Ground Gases													
				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	0.50	3.00	NS	0.00	0.00	2.30	2.30	17.50	17.50	0.00	0.00	Not Recorded	
WS02	0.60	1.60	NS	0.00	0.00	5.80	5.80	15.00	15.00	0.00	0.00	Not Recorded	
WS03	1.00	3.00	NS	0.00	0.00	1.40	1.40	18.90	18.90	0.00	0.00	Not Recorded	
WS04	0.50	1.50	NS	0.00	0.00	0.30	0.30	19.40	19.40	0.00	0.00	Not Recorded	
WS06	1.00	2.00	NS	0.00	0.00	0.60	0.60	19.60	19.60	0.00	0.00	Not Recorded	

Ground Waters	
Depth to Groundwater mbegl	Total Well Depth mbegl
1.03	2.91
0.85	1.63
0.58	3.15
0.00	1.41
0.95	1.92

Comments All holes bailed.

Notes

L.E.L. Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
 N.D. Not Detected
 N.R. Not Recorded
 PID Photo-Ionising Detector
 % By volume

Highlighted cell for following conditions:
 a Methane =>1% v/v
 b Carbon Dioxide =>5% v/v
 MG Made Ground
 NS Natural Strata

Ground Material Key

NS Natural Strata



In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction
 Date: 17/01/2019
 Weather: Ice
 Atmospheric Pressure (mb): 1003
 Pressure Trend: Rising
 Equipment: Gas Data LMSXi, Ion Science Tiger Pro Photo-ionising detector (PID)
 Operator: Tom Robson

Ground Gases													
				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	0.50	3.00	NS	0.00	0.00	0.70	0.70	19.40	19.40	0.00	0.00	0.60	0.60
WS02	0.60	1.60	NS	0.00	0.00	6.90	6.90	15.50	15.50	0.00	0.00	0.20	0.20
WS03	1.00	3.00	NS	0.00	0.00	1.30	1.30	19.20	19.20	0.00	0.00	0.00	0.00
WS04	0.50	1.50	NS	0.00	0.00	0.00	0.00	20.00	20.00	0.00	0.00	0.00	0.00
WS06	1.00	2.00	NS	0.00	0.00	0.00	0.00	19.80	19.80	0.00	0.00	0.30	0.30

Ground Waters	
Depth to Groundwater mbegl	Total Well Depth mbegl
1.10	2.90
0.89	1.63
0.68	3.20
0.30	1.43
1.10	1.90

Comments: None.

Notes

L.E.L. Lower Explosive Limit (100% L.E.L. = 5% Flammable Gas)
 N.D. Not Detected
 N.R. Not Recorded
 PID Photo-Ionising Detector
 % By volume

Highlighted cell for following conditions:
 a Methane $\geq 1\%$ v/v
 b Carbon Dioxide $\geq 5\%$ v/v
 MG Made Ground
 NS Natural Strata

Ground Material Key

NS Natural Strata



In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction
 Date: 28/01/2019
 Weather: Ice
 Atmospheric Pressure (mb): 1006
 Pressure Trend: Steady
 Equipment: Gas Data GFM430, Ion Science Tiger Pro Photo-ionising detector (PID)
 Operator: Tom Robson

Ground Gases													
				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	0.50	3.00	NS	0.00	0.00	2.90	2.90	18.30	18.30	0.00	0.00	0.30	0.30
WS02	0.60	1.60	NS	0.00	0.00	0.90	0.90	15.10	15.10	0.00	0.00	0.30	0.30
WS03	1.00	3.00	NS	0.00	0.00	0.70	0.70	19.60	19.60	0.00	0.00	0.30	0.30
WS04	0.50	1.50	NS	0.00	0.00	0.00	0.00	19.90	19.90	0.00	0.00	0.00	0.00
WS06	1.00	2.00	NS	0.00	0.00	0.00	0.00	19.80	19.80	0.00	0.00	0.30	0.30

Ground Waters	
Depth to Groundwater mbegl	Total Well Depth mbegl
1.10	2.91
0.93	1.65
0.67	3.12
0.33	1.39
1.10	1.91

Comments: None.

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L. = 5% Flammable Gas)	Highlighted cell for following conditions:
N.D.	Not Detected	a Methane =>1% v/v
N.R.	Not Recorded	b Carbon Dioxide =>5% v/v
PID	Photo-Ionising Detector	MG Made Ground
%	By volume	NS Natural Strata

Ground Material Key

NS Natural Strata



In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction
 Date: 12/02/2019
 Weather: Sunny
 Atmospheric Pressure (mb): 1031
 Pressure Trend: Steady
 Equipment: Gas Data GFM430, Ion Science Tiger Pro Photo-ionising detector (PID)
 Operator: Tom Robson

Ground Gases													
				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	0.50	3.00	NS	0.00	0.00	2.60	2.60	18.30	18.30	0.00	0.00	0.00	0.00
WS02	0.60	1.60	NS	0.00	0.00	4.50	4.50	16.90	16.90	0.00	0.00	0.00	0.00
WS03	1.00	3.00	NS	0.00	0.00	0.30	0.30	20.00	20.00	0.00	0.00	0.00	0.00
WS04	0.50	1.50	NS	0.00	0.00	0.00	0.00	20.10	20.10	0.00	0.00	0.00	0.00
WS06	1.00	2.00	NS	0.00	0.00	0.70	0.70	19.60	19.60	0.00	0.00	0.00	0.00

Ground Waters	
Depth to Groundwater mbegl	Total Well Depth mbegl
0.87	2.89
0.75	1.63
0.49	3.17
0.00	1.40
0.75	1.91

Comments: All holes bailed.

Notes

L.E.L. Lower Explosive Limit (100% L.E.L. = 5% Flammable Gas)
 N.D. Not Detected
 N.R. Not Recorded
 PID Photo-Ionising Detector
 % By volume

Highlighted cell for following conditions:
 a Methane $\geq 1\%$ v/v
 b Carbon Dioxide $\geq 5\%$ v/v
 MG Made Ground
 NS Natural Strata

Ground Material Key

NS Natural Strata



In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction
 Date: 25/02/2019
 Weather: Sunny
 Atmospheric Pressure (mb): 1039
 Pressure Trend: Steady
 Equipment: Gas Data GFM430
 Operator: Tom Robson

Ground Gases													
				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	0.50	3.00	NS	0.00	0.00	2.50	2.50	17.70	17.70	0.00	0.00	Not Recorded	
WS02	0.60	1.60	NS	0.00	0.00	5.40	5.40	14.70	14.70	0.00	0.00	Not Recorded	
WS03	1.00	3.00	NS	0.00	0.00	0.60	0.60	19.80	19.80	0.00	0.00	Not Recorded	
WS04	0.50	1.50	NS	0.00	0.00	0.00	0.00	20.00	20.00	0.00	0.00	Not Recorded	
WS06	1.00	2.00	NS	0.00	0.00	0.40	0.40	19.80	19.80	0.00	0.00	Not Recorded	

Ground Waters	
Depth to Groundwater mbegl	Total Well Depth mbegl
1.05	2.93
0.88	1.63
0.63	3.14
0.29	1.39
1.06	1.91

Comments

Notes

L.E.L. Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
 N.D. Not Detected
 N.R. Not Recorded
 PID Photo-Ionising Detector
 % By volume

Highlighted cell for following conditions:
 a Methane =>1% v/v
 b Carbon Dioxide =>5% v/v
 MG Made Ground
 NS Natural Strata

Ground Material Key

NS Natural Strata



In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction
 Date: 18/06/2019
 Weather: Partly Sunny
 Atmospheric Pressure (mb): 1014
 Pressure Trend: Falling
 Equipment: Gas Data LMSXi
 Operator: Bryan Burgh

Ground Gases													
				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	0.50	3.00	NS	0.00	0.00	1.60	1.60	20.20	20.20	0.00	0.00	Not Recorded	
WS02	0.60	1.60	NS										
WS03	1.00	3.00	NS	0.00	0.00	1.20	1.20	20.40	20.40	0.00	0.00	Not Recorded	
WS04	0.50	1.50	NS	0.00	0.00	1.80	1.80	19.60	19.60	0.00	0.00	Not Recorded	
WS06	1.00	2.00	NS	0.00	0.00	1.10	1.10	20.50	20.50	0.00	0.00	Not Recorded	
WS109	1.40	2.30	NS	0.00	0.00	4.70	4.70	6.90	6.90	0.00	0.00	Not Recorded	
BH101	4.00	15.00	NS	0.00	0.00	0.40	0.40	20.60	20.60	0.00	0.00	Not Recorded	
BH102	1.00	1.70	NS	0.00	0.00	6.30	6.30	14.10	14.10	0.00	0.00	Not Recorded	

Ground Waters	
Depth to Groundwater mbegl	Total Well Depth mbegl
0.68	2.92
0.00	3.10
0.00	1.35
0.60	1.87
0.62	2.25
0.74	15.05
1.12	1.82

Comments WS02, ground water logged and overgrown.

Notes

L.E.L. Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
 N.D. Not Detected
 N.R. Not Recorded
 PID Photo-Ionising Detector
 % By volume

Highlighted cell for following conditions:
 a Methane =>1% v/v
 b Carbon Dioxide =>5% v/v
 MG Made Ground
 NS Natural Strata

Ground Material Key

NS Natural Strata



In-Situ Gas Monitoring Results

Project Name: Crease Drove Crowland Peterborough
 Project Number: P8723
 Client: Partner Construction

Pressure Range:	900mb-1044mb
Reading Below 1000mb:	1

Summary of Results for period: **20/12/2018** to **18/06/2019 12:00:00**

Ground Gases													
				Methane (%v/v)		CO2 (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm)	
ID	Top	Base	Strata	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
WS01 (7)	0.50	3.00	NS	0.00	0.00	0.70	2.90	17.50	20.20	0.00	0.00	0.00	0.60
WS02 (7)	0.60	1.60	NS	0.00	0.00	0.90	6.90	14.70	16.90	0.00	0.00	0.00	0.30
WS03 (7)	1.00	3.00	NS	0.00	0.00	0.30	1.40	18.90	20.40	0.00	0.00	0.00	0.30
WS04 (7)	0.50	1.50	NS	0.00	0.00	0.00	1.80	19.40	20.10	0.00	0.00	0.00	0.00
WS06 (7)	1.00	2.00	NS	0.00	0.00	0.00	1.10	19.60	20.50	0.00	0.00	0.00	0.30
WS109 (1)	1.40	2.30	NS	0.00	0.00	4.70	4.70	6.90	6.90	0.00	0.00	Not Recorded	
BH101 (1)	4.00	15.00	NS	0.00	0.00	0.40	0.40	20.60	20.60	0.00	0.00	Not Recorded	
BH102 (1)	1.00	1.70	NS	0.00	0.00	6.30	6.30	14.10	14.10	0.00	0.00	Not Recorded	

Groundwater	
Depth to Groundwater (mbegl)	
Min	Max
0.68	1.10
0.75	0.93
0.00	0.68
0.00	0.39
0.60	1.10
0.62	0.62
0.74	0.74
1.12	1.12

BS8485:2015 Suggested Worse Case Site Classification: CS-2

Site Summary:

	GSV (l/h)	Max Values
Methane	0.0001	0.1
CO2	0.0069	6.9
Default Flow (l/h)	0.1	

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L. = 5% Flammable Gas)	Highlighted cell for following conditions:
N.D.	Not Detected	a Methane =>1% v/v
N.R.	Not Recorded	b Carbon Dioxide =>5% v/v
PID	Photo-Ionising Detector	GSV Gas Screening Value:
%	By volume	Peak state values used for Methane
NS	Natural Strata	Steady state values used for Carbon Dioxide and Gas Flow



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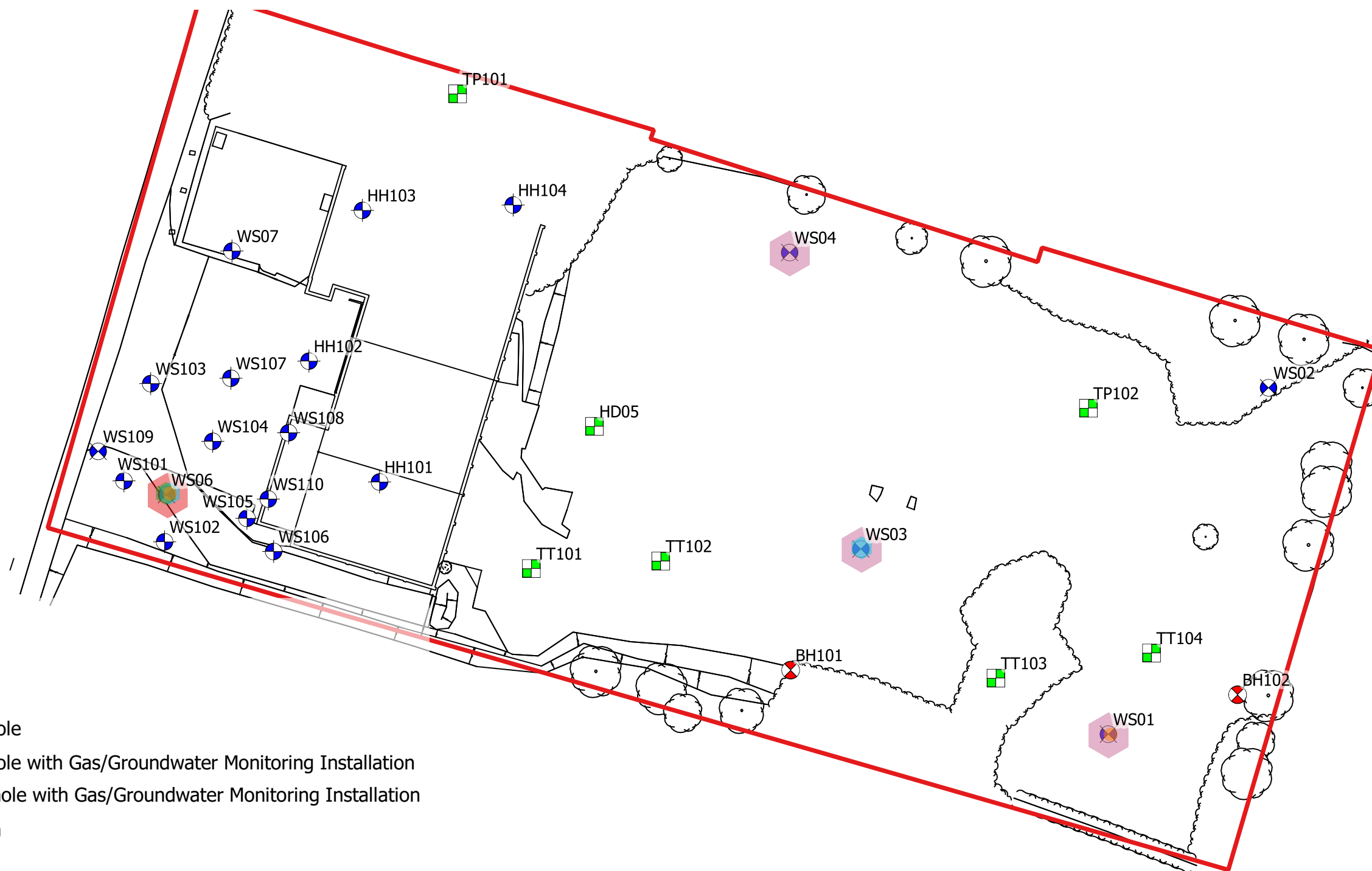
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Site Boundary

Exploratory Holes

Trial Pit

Window Sample Borehole

Window Sample Borehole with Gas/Groundwater Monitoring Installation

Cable Percussive Borehole with Gas/Groundwater Monitoring Installation

Groundwater Contamination

Hydrocarbons

Volatile Organic Compounds

Benzo(a)pyrene

Iron

Nickel



NOTES:

NOTES

CLIENT:

Partner Construction Ltd &
Waterloo Housing Group Ltd

PROJECT:

Crease Drove, Crowland

TITLE:

Exploratory Holes with Groundwater Contamination

PROJECT No:

P8723

DATE:

07/2019

DESIGN/DRAWN:

CM

DRAWING NUMBER:

06

ISSUE:

FINAL

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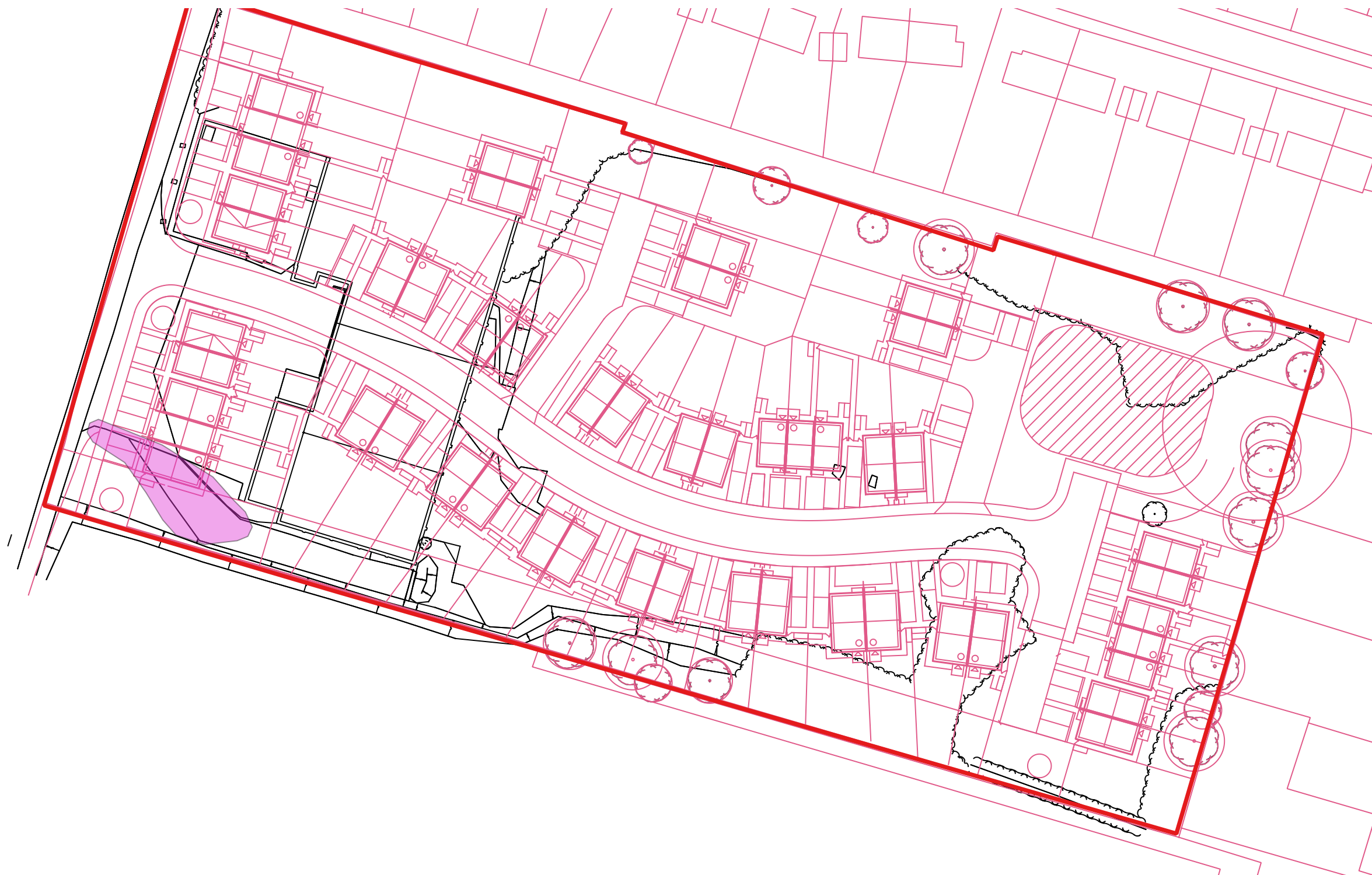
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N
↑

Site Boundary
 Approximate Extent of Contamination

NOTES:
Background pink lines: proposed development outline, dated: October 2018.

CLIENT:	Partner Construction Ltd & Waterloo Housing Group Ltd
PROJECT:	Crease Drove, Crowland
TITLE:	Illustrative Remediation Plan

PROJECT No:	P8723	DATE:	07/2019	DESIGN/DRAWN:	CM	
DRAWING NUMBER:		07		ISSUE:		FINAL
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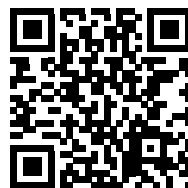
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Waste Classification Report



CRX7R-BEKJ4-3ECE7

Job name

P8723 Crease Drove

Description/Comments

Assessment based on chemical analysis for human health risk assessment from ground investigation.

Project

P8723

Site

Crease Drove, Crowlands

Related Documents

#	Name	Description
None		

Waste Stream Template

GRM Standard Suite - incl TPH

Classified by

Name:
Charlotte Mortimer
Date:
01 Jul 2019 09:53 GMT
Telephone:
01283 551 249

Company:
GRM Development Solutions Ltd
Laurus House
Centrum 100, First Avenue
Burton Upon Trent
DE14 2WH

Report

Created by: Charlotte Mortimer
Created date: 01 Jul 2019 09:53 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01	0.05	Non Hazardous		3
2	WS01[1]	0.80	Non Hazardous		5
3	WS02	0.20	Non Hazardous		6
4	WS02[1]	0.80	Non Hazardous		8
5	WS03	0.20	Non Hazardous		9
6	WS03[1]	0.70	Non Hazardous		11
7	WS04	1.40	Non Hazardous		12
8	HD05	0.05	Non Hazardous		13
9	WS06	0.9	Hazardous	HP 3(i), HP 7, HP 11	15
10	WS06[1]	0.40	Non Hazardous		17
11	WS06[2]	1.00	Non Hazardous		19

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
12	WS07	0.30	Hazardous	HP 8	20
13	WS101	0.7	Non Hazardous		22
14	WS103	1.3	Non Hazardous		23
15	WS104	1.5	Non Hazardous		25
16	WS106	1.7	Non Hazardous		26
17	WS107	1.1	Non Hazardous		27
18	WS109	1.5	Hazardous	HP 3(i), HP 7, HP 11	28
19	WS110	1.8	Non Hazardous		31
20	HH101	0.3	Non Hazardous		32
21	HH102	0.4	Non Hazardous		34
22	HH103	0.9	Non Hazardous		36
23	HH104	0.3	Non Hazardous		38
24	HH104[2]	1.3	Non Hazardous		40
25	WS102	2.8	Non Hazardous		41
26	WS104[2]	0.5	Non Hazardous		42
27	WS105	1.1	Non Hazardous		43
28	WS107[2]	1.8	Non Hazardous		44
29	WS109[2]	2.8	Non Hazardous		45

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	46
Appendix B: Rationale for selection of metal species	47
Appendix C: Version	48

Classification of sample: WS01

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS01	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.05 m		
Moisture content:		
39%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 39% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				15 mg/kg	1.32	14.248 mg/kg	0.00142 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium sulfide }			1	0.8 mg/kg	1.285	0.74 mg/kg	0.0000576 %	✓		
	048-010-00-4	215-147-8	1306-23-6								
3	chromium { chromium(III) oxide }				34 mg/kg	1.462	35.75 mg/kg	0.00358 %	✓		
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				33 mg/kg	1.126	26.73 mg/kg	0.00267 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	40 mg/kg		28.777 mg/kg	0.00288 %	✓		
	082-001-00-6										
6	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel dihydroxide }				41 mg/kg	1.579	46.59 mg/kg	0.00466 %	✓		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	2.554	<20.429 mg/kg	<0.00204 %			<LOD
	034-002-00-8										
9	zinc { zinc sulphate }				120 mg/kg	2.469	213.177 mg/kg	0.0213 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
10	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
12	pH				6.7 pH		6.7 pH	6.7 pH			
			PH								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.04 mg/kg		0.0288 mg/kg	0.00000288 %	✓		
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.04 mg/kg		0.0288 mg/kg	0.00000288 %	✓		
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.07 mg/kg		0.0504 mg/kg	0.00000504 %	✓		
19	benzo[ghi]perylene	205-883-8	191-24-2		0.04 mg/kg		0.0288 mg/kg	0.00000288 %	✓		
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	0.05 mg/kg		0.036 mg/kg	0.0000036 %	✓		
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		0.07 mg/kg		0.0504 mg/kg	0.00000504 %	✓		
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.03 mg/kg		0.0216 mg/kg	0.00000216 %	✓		
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		0.04 mg/kg		0.0288 mg/kg	0.00000288 %	✓		
28	pyrene	204-927-3	129-00-0		0.07 mg/kg		0.0504 mg/kg	0.00000504 %	✓		
Total:									0.0393 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS01[1]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS01[1]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.80 m		

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	● pH				5.9 pH		5.9	pH	5.9 pH		
Total:									0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS02

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	WS02	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.20 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)	
Moisture content:	37%			
	(dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 37% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				21	mg/kg	1.32	20.239	mg/kg	0.00202 %	✓	
	033-003-00-0	215-481-4	1327-53-3										
2		cadmium { cadmium sulfide }			1	0.9	mg/kg	1.285	0.844	mg/kg	0.0000657 %	✓	
	048-010-00-4	215-147-8	1306-23-6										
3		chromium { chromium(III) oxide }				43	mg/kg	1.462	45.874	mg/kg	0.00459 %	✓	
		215-160-9	1308-38-9										
4		copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	21.367	mg/kg	0.00214 %	✓	
	029-002-00-X	215-270-7	1317-39-1										
5		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	58	mg/kg		42.336	mg/kg	0.00423 %	✓	
	082-001-00-6												
6		mercury { mercury dichloride }				<2.5	mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7										
7		nickel { nickel dihydroxide }				30	mg/kg	1.579	34.588	mg/kg	0.00346 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]										
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	2.554	<20.429	mg/kg	<0.00204 %		<LOD
	034-002-00-8												
9		zinc { zinc sulphate }				100	mg/kg	2.469	180.241	mg/kg	0.018 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]										
10		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2										
11		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
	006-007-00-5												
12		pH				6.7	pH		6.7	pH	6.7 pH		
				PH									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	■ acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	■ acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	■ anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.04 mg/kg		0.0292 mg/kg	0.00000292 %	✓		
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.04 mg/kg		0.0292 mg/kg	0.00000292 %	✓		
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.07 mg/kg		0.0511 mg/kg	0.00000511 %	✓		
19	benzo[ghi]perylene	205-883-8	191-24-2		0.04 mg/kg		0.0292 mg/kg	0.00000292 %	✓		
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	0.06 mg/kg		0.0438 mg/kg	0.00000438 %	✓		
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		0.09 mg/kg		0.0657 mg/kg	0.00000657 %	✓		
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.03 mg/kg		0.0219 mg/kg	0.00000219 %	✓		
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		0.03 mg/kg		0.0219 mg/kg	0.00000219 %	✓		
28	pyrene	204-927-3	129-00-0		0.07 mg/kg		0.0511 mg/kg	0.00000511 %	✓		
Total:									0.0372 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
🧪	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02[1]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS02[1]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.80 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	• pH				6.8 pH		6.8 pH	6.8 pH		
			PH							
Total:								0%		

Key

	User supplied data
•	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS03

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS03	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.20 m		
Moisture content:		
44%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 44% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				25	mg/kg	1.32	22.922	mg/kg	0.00229 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfide }			1	1	mg/kg	1.285	0.893	mg/kg	0.0000694 %	✓	
	048-010-00-4	215-147-8	1306-23-6									
3	chromium { chromium(III) oxide }				52	mg/kg	1.462	52.778	mg/kg	0.00528 %	✓	
		215-160-9	1308-38-9									
4	copper { dicopper oxide; copper (I) oxide }				31	mg/kg	1.126	24.238	mg/kg	0.00242 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	72	mg/kg		50	mg/kg	0.005 %	✓	
	082-001-00-6											
6	mercury { mercury dichloride }				<2.5	mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
7	nickel { nickel dihydroxide }				31	mg/kg	1.579	34.003	mg/kg	0.0034 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	2.554	<20.429	mg/kg	<0.00204 %		<LOD
	034-002-00-8											
9	zinc { zinc sulphate }				90	mg/kg	2.469	154.331	mg/kg	0.0154 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
10	phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2									
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
	006-007-00-5											
12	pH				6	pH		6	pH	6pH		
			PH									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.09 mg/kg		0.0625 mg/kg	0.00000625 %	✓		
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.08 mg/kg		0.0556 mg/kg	0.00000556 %	✓		
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.14 mg/kg		0.0972 mg/kg	0.00000972 %	✓		
19	benzo[ghi]perylene	205-883-8	191-24-2		0.06 mg/kg		0.0417 mg/kg	0.00000417 %	✓		
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.05 mg/kg		0.0347 mg/kg	0.00000347 %	✓		
21	chrysene	601-048-00-0	205-923-4	218-01-9	0.11 mg/kg		0.0764 mg/kg	0.00000764 %	✓		
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		0.21 mg/kg		0.146 mg/kg	0.0000146 %	✓		
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.06 mg/kg		0.0417 mg/kg	0.00000417 %	✓		
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		0.09 mg/kg		0.0625 mg/kg	0.00000625 %	✓		
28	pyrene	204-927-3	129-00-0		0.18 mg/kg		0.125 mg/kg	0.0000125 %	✓		
Total:									0.0367 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS03[1]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS03[1]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.70 m		

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	● pH				5.3 pH		5.3	pH	5.3 pH		
Total:									0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS04



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS04	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.40 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	● pH				8.1 pH		8.1	pH	8.1 pH		
			PH								
Total:									0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: HD05

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
HD05	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.05 m		
Moisture content:		
21%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 21% Dry Weight Moisture Correction applied (MC)

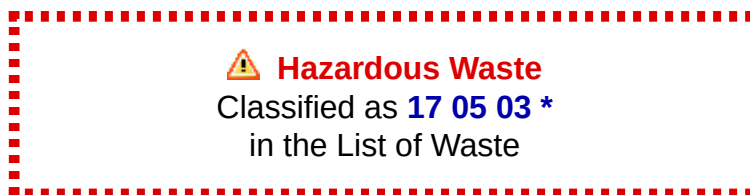
#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				16 mg/kg	1.32	17.459 mg/kg	0.00175 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium sulfide }			1	0.8 mg/kg	1.285	0.85 mg/kg	0.0000661 %	✓		
	048-010-00-4	215-147-8	1306-23-6								
3	chromium { chromium(III) oxide }				31 mg/kg	1.462	37.445 mg/kg	0.00374 %	✓		
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	16.749 mg/kg	0.00167 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	28 mg/kg		23.14 mg/kg	0.00231 %	✓		
	082-001-00-6										
6	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel dihydroxide }				21 mg/kg	1.579	27.413 mg/kg	0.00274 %	✓		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	2.554	<20.429 mg/kg	<0.00204 %			<LOD
	034-002-00-8										
9	zinc { zinc sulphate }				380 mg/kg	2.469	775.482 mg/kg	0.0775 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
10	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
12	pH				7.7 pH		7.7 pH	7.7 pH			
			PH								

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
13	acenaphthene	201-469-6	83-32-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
15	anthracene	204-371-1	120-12-7		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
23	fluoranthene	205-912-4	206-44-0		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
24	fluorene	201-695-5	86-73-7		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
27	phenanthrene	201-581-5	85-01-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
28	pyrene	204-927-3	129-00-0		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
Total:										0.0925 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS06



Sample details

Sample Name:	LoW Code:	
WS06	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 03 * (Soil and stones containing hazardous substances)
0.9 m		
Moisture content:		
22%		
(dry weight correction)		

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.23%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.23%)

Hazard properties (substances considered hazardous until shown otherwise)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

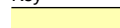
TPH (C6 to C40) petroleum group: (conc.: 0.23%)

Determinands

Moisture content: 22% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1	■	TPH (C6 to C40) petroleum group				2800 mg/kg		2295.082 mg/kg	0.23 %	✓	
				TPH							
Total:									0.23 %		

Key

-
- | | |
|---|---|
|  | User supplied data |
|  | Hazardous result |
|  | Determinand defined or amended by HazWasteOnline (see Appendix A) |

Classification of sample: WS06[1]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS06[1]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.40 m		
Moisture content:		
13%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 13% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				<10 mg/kg	1.32	<13.203 mg/kg	<0.00132 %		<LOD
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
3	chromium { chromium(III) oxide }				2.7 mg/kg	1.462	3.492 mg/kg	0.000349 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				8 mg/kg	1.126	7.971 mg/kg	0.000797 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	6.5 mg/kg		5.752 mg/kg	0.000575 %	✓	
	082-001-00-6									
6	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
7	nickel { nickel dihydroxide }				5.1 mg/kg	1.579	7.129 mg/kg	0.000713 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	2.554	<20.429 mg/kg	<0.00204 %		<LOD
	034-002-00-8									
9	zinc { zinc sulphate }				28 mg/kg	2.469	61.186 mg/kg	0.00612 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
10	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									
12	pH				8.4 pH		8.4 pH	8.4 pH		
			PH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
28	pyrene	204-927-3	129-00-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
Total:									0.0126 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS06[2]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS06[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.00 m		

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	● pH				7.3 pH		7.3	pH	7.3 pH		
Total:										0%	

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS07

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:	WS07	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.30 m	Entry:		17 05 03 * (Soil and stones containing hazardous substances)
Moisture content:	14%			
	(dry weight correction)			

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 12.2 pH)

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				29	mg/kg	1.32	33.587	mg/kg	0.00336 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfide }			1	1	mg/kg	1.285	1.127	mg/kg	0.0000877 %	✓	
	048-010-00-4	215-147-8	1306-23-6									
3	chromium { chromium(III) oxide }				28	mg/kg	1.462	35.898	mg/kg	0.00359 %	✓	
		215-160-9	1308-38-9									
4	copper { dicopper oxide; copper (I) oxide }				12	mg/kg	1.126	11.851	mg/kg	0.00119 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	11	mg/kg		9.649	mg/kg	0.000965 %	✓	
	082-001-00-6											
6	mercury { mercury dichloride }				<2.5	mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
7	nickel { nickel dihydroxide }				22	mg/kg	1.579	30.482	mg/kg	0.00305 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	2.554	<20.429	mg/kg	<0.00204 %		<LOD
	034-002-00-8											
9	zinc { zinc sulphate }				70	mg/kg	2.469	151.623	mg/kg	0.0152 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
10	phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2									
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides,				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
12	pH				12.2 pH		12.2 pH	12.2 pH		
			PH							
13	acenaphthene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		201-469-6	83-32-9							
14	acenaphthylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-917-1	208-96-8							
15	anthracene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		204-371-1	120-12-7							
16	benzo[a]anthracene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
17	benzo[a]pyrene; benzo[def]chrysene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
18	benzo[b]fluoranthene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
19	benzo[ghi]perylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-883-8	191-24-2							
20	benzo[k]fluoranthene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
21	chrysene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
22	dibenz[a,h]anthracene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
23	fluoranthene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-912-4	206-44-0							
24	fluorene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		201-695-5	86-73-7							
25	indeno[123-cd]pyrene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-893-2	193-39-5							
26	naphthalene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
27	phenanthrene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		201-581-5	85-01-8							
28	pyrene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		204-927-3	129-00-0							
Total:								0.0304 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS101



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS101	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.7 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
43%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 43% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	■	TPH (C6 to C40) petroleum group			200	mg/kg	139.86	mg/kg	0.014 %	✓	
			TPH								
							Total:	0.014 %			

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because TPH inflammable in soils at <1,000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.014%)

Classification of sample: WS103

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS103	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.3 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				36 mg/kg	1.32	41.694 mg/kg	0.00417 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium sulfide }			1	0.9 mg/kg	1.285	1.015 mg/kg	0.0000789 %	✓	
	048-010-00-4	215-147-8	1306-23-6							
3	chromium { chromium(III) oxide }				24 mg/kg	1.462	30.77 mg/kg	0.00308 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	15.802 mg/kg	0.00158 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20 mg/kg		17.544 mg/kg	0.00175 %	✓	
	082-001-00-6									
6	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
7	nickel { nickel dihydroxide }				24 mg/kg	1.579	33.253 mg/kg	0.00333 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	2.554	<20.429 mg/kg	<0.00204 %		<LOD
	034-002-00-8									
9	zinc { zinc sulphate }				67 mg/kg	2.469	145.125 mg/kg	0.0145 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
10	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									
12	pH				7.8 pH		7.8 pH	7.8 pH		
			PH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
28	pyrene	204-927-3	129-00-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
29	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
30	TPH (C6 to C40) petroleum group		TPH		<50 mg/kg		<50 mg/kg	<0.005 %			<LOD
Total:									0.0372 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS104

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS104	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.5 m		
Moisture content:		
16%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 16% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	■	TPH (C6 to C40) petroleum group			690	mg/kg	594.828	mg/kg	0.0595 %	✓	
			TPH								
Total:								0.0595 %			

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because TPH inflammable in soils at <1,000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0595%)

Classification of sample: WS106



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS106	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.7 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.4%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	●	TPH (C6 to C40) petroleum group			20	mg/kg	18.45	mg/kg	0.00185 %	✓	
			TPH								
Total:									0.00185 %		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because TPH inflammable in soils at <1,000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00185%)

Classification of sample: WS107

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS107	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.1 m		
Moisture content:		
21%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 21% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	■	TPH (C6 to C40) petroleum group			29 mg/kg		23.967 mg/kg	0.0024 %	✓	
			TPH							
Total:								0.0024 %		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because TPH inflammable in soils at <1,000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0024%)

Classification of sample: WS109

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS109	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.5 m	Entry:
Moisture content:	17 05 03 * (Soil and stones containing hazardous substances)
64%	
(dry weight correction)	

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.159%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.159%)

Hazard properties (substances considered hazardous until shown otherwise)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.159%)

Determinands

Moisture content: 64% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	 arsenic { arsenic trioxide }				23 mg/kg	1.32	18.517 mg/kg	0.00185 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
2	 cadmium { cadmium sulfide }			1	1 mg/kg	1.285	0.784 mg/kg	0.000061 %		✓	
	048-010-00-4	215-147-8	1306-23-6								

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
3	chromium { chromium(III) oxide }	215-160-9	1308-38-9	1	40	mg/kg	1.462	35.648	mg/kg	0.00356 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7		26	mg/kg	1.126	17.849	mg/kg	0.00178 %	✓	
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			53	mg/kg		32.317	mg/kg	0.00323 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8		<2.5	mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]		33	mg/kg	1.579	31.783	mg/kg	0.00318 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<8	mg/kg	2.554	<20.429	mg/kg	<0.00204 %		<LOD
9	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]		96	mg/kg	2.469	144.544	mg/kg	0.0145 %	✓	
10	phenol	604-001-00-2	203-632-7		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
12	pH		PH		6.9	pH		6.9	pH	6.9 pH		
13	acenaphthene		201-469-6	1	2.4	mg/kg		1.463	mg/kg	0.000146 %	✓	
14	acenaphthylene		205-917-1		0.51	mg/kg		0.311	mg/kg	0.0000311 %	✓	
15	anthracene		204-371-1		1	mg/kg		0.61	mg/kg	0.000061 %	✓	
16	benzo[a]anthracene	601-033-00-9	200-280-6		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
19	benzo[ghi]perylene		205-883-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	chrysene	601-048-00-0	205-923-4		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	fluoranthene		205-912-4		0.1	mg/kg		0.061	mg/kg	0.0000061 %	✓	
24	fluorene		201-695-5		1.9	mg/kg		1.159	mg/kg	0.000116 %	✓	
25	indeno[123-cd]pyrene		205-893-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	naphthalene	601-052-00-2	202-049-5		0.96	mg/kg		0.585	mg/kg	0.0000585 %	✓	
27	phenanthrene		201-581-5		5	mg/kg		3.049	mg/kg	0.000305 %	✓	
28	pyrene		204-927-3		0.1	mg/kg		0.061	mg/kg	0.0000061 %	✓	

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
29		asbestos				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
	650-013-00-6	-----	12001-28-4								
			132207-32-0								
			12172-73-5								
			77536-66-4								
			77536-68-6								
30	●	TPH (C6 to C40) petroleum group				2600 mg/kg		1585.366 mg/kg	0.159 %	✓	
				TPH							
Total:									0.191 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Hazardous result
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS110

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS110	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.8 m		
Moisture content:		
17%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 17% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	■	TPH (C6 to C40) petroleum group			19	mg/kg	16.239	mg/kg	0.00162 %	✓
			TPH							
Total:								0.00162 %		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because TPH inflammable in soils at <1,000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00162%)

Classification of sample: HH101

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	HH101	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.3 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)	
Moisture content:	13%			
	(dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 13% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	<10 mg/kg	1.32	<13.203 mg/kg	<0.00132 %			<LOD
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	0.5 mg/kg	1.285	0.569 mg/kg	0.0000442 %	✓		
3	chromium { chromium(III) oxide }	215-160-9	1308-38-9		9.2 mg/kg	1.462	11.899 mg/kg	0.00119 %	✓		
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	22 mg/kg	1.126	21.92 mg/kg	0.00219 %	✓		
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			14 mg/kg		12.389 mg/kg	0.00124 %	✓		
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %			<LOD
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]	14 mg/kg	1.579	19.569 mg/kg	0.00196 %	✓		
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<8 mg/kg	2.554	<20.429 mg/kg	<0.00204 %			<LOD
9	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]	35 mg/kg	2.469	76.483 mg/kg	0.00765 %	✓		
10	phenol	604-001-00-2	203-632-7	108-95-2	<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
12	pH				8.6 pH		8.6 pH	8.6 pH			

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.02 mg/kg		0.0177 mg/kg	0.00000177 %	✓	
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
23	fluoranthene	205-912-4	206-44-0		0.03 mg/kg		0.0265 mg/kg	0.00000265 %	✓	
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
27	phenanthrene	201-581-5	85-01-8		0.02 mg/kg		0.0177 mg/kg	0.00000177 %	✓	
28	pyrene	204-927-3	129-00-0		0.03 mg/kg		0.0265 mg/kg	0.00000265 %	✓	
29	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
30	TPH (C6 to C40) petroleum group		TPH		<50 mg/kg		<50 mg/kg	<0.005 %		<LOD
Total:								0.0243 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: HH102

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	HH102	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.4 m	Entry:		17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:	8.9%			
	(dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 8.9% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }			1	<10	mg/kg	1.32	<13.203	mg/kg	<0.00132 %		<LOD
	033-003-00-0	215-481-4	1327-53-3										
2		cadmium { cadmium sulfide }			1	0.2	mg/kg	1.285	0.236	mg/kg	0.0000184 %	✓	
	048-010-00-4	215-147-8	1306-23-6										
3		chromium { chromium(III) oxide }				<1	mg/kg	1.462	<1.462	mg/kg	<0.000146 %		<LOD
		215-160-9	1308-38-9										
4		copper { dicopper oxide; copper (I) oxide }				14	mg/kg	1.126	14.474	mg/kg	0.00145 %	✓	
	029-002-00-X	215-270-7	1317-39-1										
5		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	3	mg/kg		2.755	mg/kg	0.000275 %	✓	
	082-001-00-6												
6		mercury { mercury dichloride }				<2.5	mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7										
7		nickel { nickel dihydroxide }				2.9	mg/kg	1.579	4.206	mg/kg	0.000421 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]										
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	2.554	<20.429	mg/kg	<0.00204 %		<LOD
	034-002-00-8												
9		zinc { zinc sulphate }				11	mg/kg	2.469	24.942	mg/kg	0.00249 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]										
10		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2										
11		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
	006-007-00-5												
12		pH				8.6	pH		8.6	pH	8.6 pH		
				PH									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
28	pyrene	204-927-3	129-00-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
29	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
30	TPH (C6 to C40) petroleum group		TPH		<50 mg/kg		<50 mg/kg	<0.005 %			<LOD
Total:									0.0148 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: HH103

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	HH103	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.9 m	Entry:		17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:	14%			
	(dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				<10	mg/kg	1.32	<13.203	mg/kg	<0.00132 %		<LOD
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfide }			1	0.4	mg/kg	1.285	0.451	mg/kg	0.0000351 %	✓	
	048-010-00-4	215-147-8	1306-23-6									
3	chromium { chromium(III) oxide }				18	mg/kg	1.462	23.077	mg/kg	0.00231 %	✓	
		215-160-9	1308-38-9									
4	copper { dicopper oxide; copper (I) oxide }				7	mg/kg	1.126	6.913	mg/kg	0.000691 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17	mg/kg		14.912	mg/kg	0.00149 %	✓	
	082-001-00-6											
6	mercury { mercury dichloride }				<2.5	mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
7	nickel { nickel dihydroxide }				16	mg/kg	1.579	22.168	mg/kg	0.00222 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	2.554	<20.429	mg/kg	<0.00204 %		<LOD
	034-002-00-8											
9	zinc { zinc sulphate }				43	mg/kg	2.469	93.14	mg/kg	0.00931 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
10	phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2									
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
	006-007-00-5											
12	pH				7.7	pH		7.7	pH	7.7 pH		
			PH									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
28	pyrene	204-927-3	129-00-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
29	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
30	TPH (C6 to C40) petroleum group		TPH		<50 mg/kg		<50 mg/kg	<0.005 %			<LOD
Total:									0.0261 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: HH104

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	HH104	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.3 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)	
Moisture content:	13%			
	(dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 13% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				17	mg/kg	1.32	19.863	mg/kg	0.00199 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfide }			1	0.7	mg/kg	1.285	0.796	mg/kg	0.0000619 %	✓	
	048-010-00-4	215-147-8	1306-23-6									
3	chromium { chromium(III) oxide }				23	mg/kg	1.462	29.748	mg/kg	0.00297 %	✓	
		215-160-9	1308-38-9									
4	copper { dicopper oxide; copper (I) oxide }				6.7	mg/kg	1.126	6.676	mg/kg	0.000668 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20	mg/kg		17.699	mg/kg	0.00177 %	✓	
	082-001-00-6											
6	mercury { mercury dichloride }				<2.5	mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
7	nickel { nickel dihydroxide }				23	mg/kg	1.579	32.149	mg/kg	0.00321 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	2.554	<20.429	mg/kg	<0.00204 %		<LOD
	034-002-00-8											
9	zinc { zinc sulphate }				56	mg/kg	2.469	122.372	mg/kg	0.0122 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
10	phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2									
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
	006-007-00-5											
12	pH				7.8	pH		7.8	pH	7.8 pH		
			PH									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
13	acenaphthene	201-469-6	83-32-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
14	acenaphthylene	205-917-1	208-96-8		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
15	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
23	fluoranthene	205-912-4	206-44-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
24	fluorene	201-695-5	86-73-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
27	phenanthrene	201-581-5	85-01-8		0.03 mg/kg		0.0265 mg/kg	0.00000265 %	✓		
28	pyrene	204-927-3	129-00-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
29	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
30	TPH (C6 to C40) petroleum group		TPH		<50 mg/kg		<50 mg/kg	<0.005 %			<LOD
Total:									0.0316 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: HH104[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
HH104[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.3 m		
Moisture content:		
16%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 16% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	■	TPH (C6 to C40) petroleum group			570	mg/kg	491.379	mg/kg	0.0491 %	✓	
				TPH							
Total:									0.0491 %		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because TPH inflammable in soils at <1,000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0491%)

Classification of sample: WS102

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS102	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.8 m		
Moisture content:		
23%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 23% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	■	TPH (C6 to C40) petroleum group			<50 mg/kg		<50 mg/kg	<0.005 %		<LOD
			TPH							
Total:								0.005 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- <LOD Below limit of detection

Classification of sample: WS104[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS104[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m		
Moisture content:		
52%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 52% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				1300 mg/kg		855.263 mg/kg	0.0855 %	✓	
			TPH							
Total:								0.0855 %		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because TPH inflammable in soils at <1,000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0855%)

Classification of sample: WS105

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS105	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.1 m		
Moisture content:		
19%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 19% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	■	TPH (C6 to C40) petroleum group			<50 mg/kg		<50 mg/kg	<0.005 %		<LOD
			TPH							
Total:								0.005 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- <LOD Below limit of detection

Classification of sample: WS107[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS107[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.8 m		
Moisture content:		
14%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	TPH (C6 to C40) petroleum group				<50 mg/kg		<50 mg/kg	<0.005 %		<LOD	
			TPH								
Total:							0.005 %				

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- <LOD** Below limit of detection

Classification of sample: WS109[2]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS109[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.8 m		
Moisture content:		
11%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 11% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	■	TPH (C6 to C40) petroleum group			<50 mg/kg		<50 mg/kg	<0.005 %		<LOD
			TPH							
Total:								0.005 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- <LOD Below limit of detection

Appendix A: Classifier defined and non CLP determinands

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Aquatic Chronic 2 H411, Repr. 2 H361d, Carc. 1B H350, Muta. 1B H340, STOT RE 2 H373, Asp. Tox. 1 H304, Flam. Liq. 3 H226

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Aquatic Chronic 1 H410, Aquatic Acute 1 H400, Repr. 1B H360FD, Skin Sens. 1 H317, Resp. Sens. 1 H334, Skin Irrit. 2 H315, STOT SE 3 H335, Eye Irrit. 2 H319, Acute Tox. 4 H302, Acute Tox. 4 H332

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 1; Carcinogenic to humans; Lead REACH Consortium considers some lead compounds Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s)/Risk Phrase(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s)/Risk Phrase(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Aquatic Chronic 2 H411, Aquatic Chronic 1 H410, Aquatic Acute 1 H400, Skin Irrit. 2 H315, STOT SE 3 H335, Eye Irrit. 2 H319

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Skin Irrit. 2 H315, STOT SE 3 H335, Eye Irrit. 2 H319, Acute Tox. 1 H310, Acute Tox. 1 H330, Acute Tox. 4 H302

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Aquatic Chronic 1 H410, Aquatic Acute 1 H400, Skin Sens. 1 H317, Skin Irrit. 2 H315, STOT SE 3 H335, Eye Irrit. 2 H319

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

▪ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

▪ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

▪ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on risk phrases

cadmium {cadmium sulfide}

Worst case species based on risk phrases

chromium {chromium(III) oxide}

No hexavalent chromium present

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

No hexavalent chromium present

mercury {mercury dichloride}

Worst case species based on risk phrases

nickel {nickel dihydroxide}

Worst case species based on risk phrases

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species based on risk phrases

zinc {zinc sulphate}

No hexavalent chromium present

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Worst case species

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2019.177.3892.7912 (27 Jun 2019)

HazWasteOnline Database: 2019.177.3892.7912 (27 Jun 2019)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004

1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010

2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010



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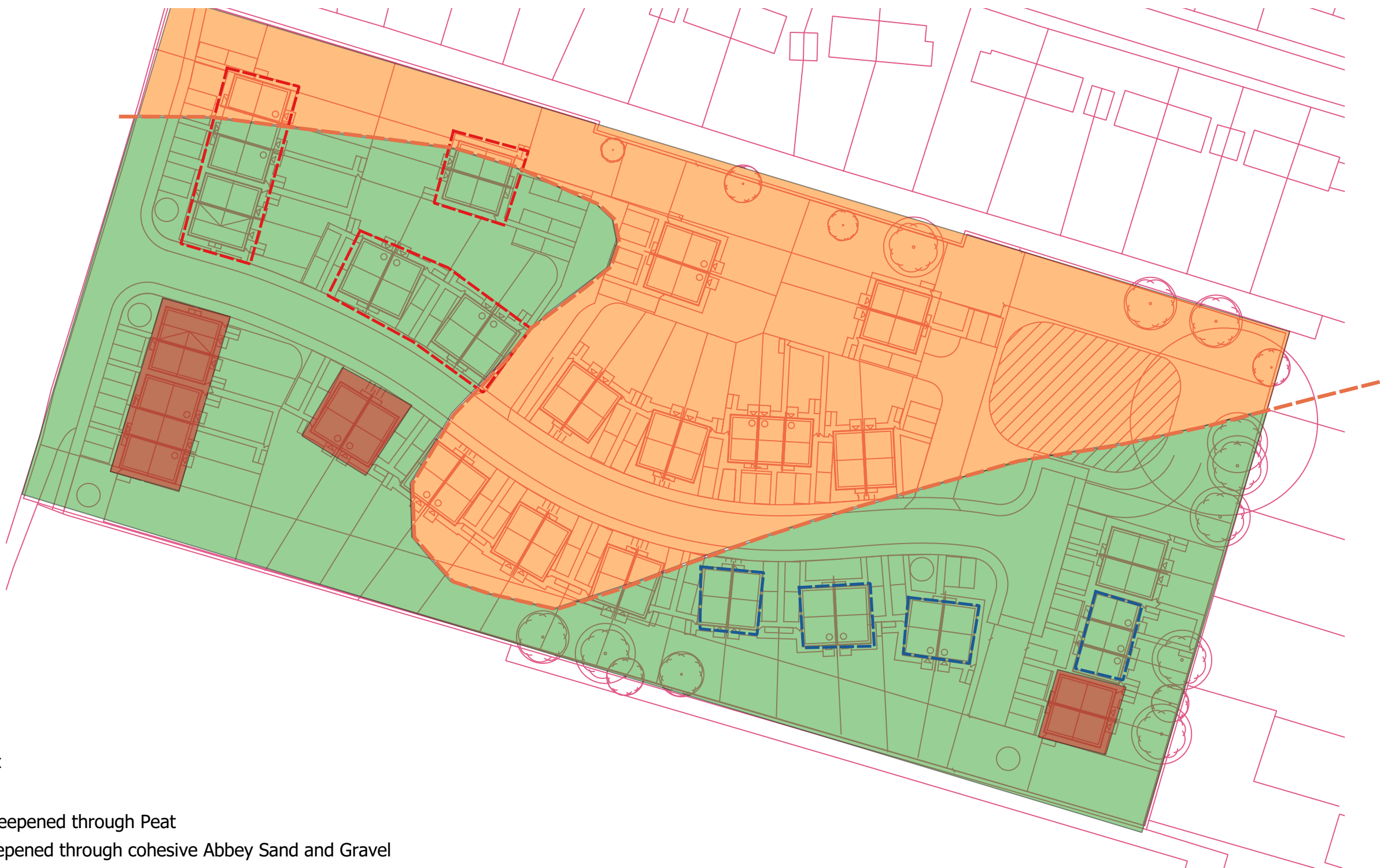
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Site Boundary

Approximate Extent of Peat

Foundations

Traditional Foundations - deepened through Peat

Traditional Foundations deepened through cohesive Abbey Sand and Gravel

Plots that require piles

Plots that may require piles

Plots to be piled or traditional foundations to suit client's preferences



NOTES:

NOTES

CLIENT: Partner Construction Ltd & Waterloo Housing Group Ltd

PROJECT: Crease Drove, Crowland

TITLE: Illustrative Foundation Zone Plan

PROJECT No: P8723

DATE: 07/2019

DESIGN/DRAWN: CM

DRAWING NUMBER: 08

ISSUE: FINAL

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