Stewartby Waste Transfer Station

Site Condition Report

FCC Waste Services (UK) Ltd

Report No. 14-K0157-ENV-R-00002
13 September 2022
Revision 01

FCC Environment

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Disclaimer: Please note that this report is based on specific information, instructions and information from our Client and should not be relied upon by third parties.					

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Contents

1 Introduction

1.1 Report Objectives

This Site Condition Report (SCR) has been prepared by ByrneLooby Partners (UK) Limited to support a permit application by FCC Waste Services (UK) Limited (the Operator) for a Waste Transfer Station (WTS) at Stewartby, Bedford (the Site).

This report has been produced in accordance with the Environment Agency H5 Site Condition Report Guidance (LIT 8001 Version 3.0 April 2013) using the H5 template[1]. A Geoenvironmental Desk Study and Ground Investigation completed by JPG (referenced: 5112-JPG-XX-XX-RP-G-0602-S2-P01) is provided for the Site at Appendix B. A Phase 2 Ground Investigation Report completed by TerraConsult Limited (TCL) (referenced: 4329/01 Issue 2) is provided for the Site at Appendix C. The *Stewartby Landfill Site: Site Report* completed by Environmental Simulations International Ltd (ESI) (referenced: 6397R2) is provided for the Site access road, weighbridge and weighbridge officers at Appendix D.

[1] Environmental permitting: H5 Site condition report - GOV.UK (www.gov.uk)

2 Site Condition Report

2.1 H5 Section 1

1.0 SITE DETAILS	
Name of the applicant	FCC Waste Services (UK) Limited
Activity address	Stewartby Waste Transfer Station, Green Lane, Stewartby, Bedford, Bedfordshire, MK43 9LY
National grid reference	TL 01694 43157

Document reference and dates for Site Condition Report at permit application and surrender	14-K0157-ENV-R-00002

Document references for site plans (including location and boundaries)	K0157/1/001 – Permit Boundary Plan

2.2 H5 Section 2

2.0 Condition of the land at permit issue	
Environmental setting including: geology hydrogeology surface waters	**Geology** Information published by the British Geological Society (BGS) indicates that superficial deposits are absent beneath the site, however Glacial Till (Boulder Clay) and alluvium deposits are located in close proximity. The bedrock comprises mudstone of the Peterborough Member. JPG's Report found ground conditions encountered generally comprised of made ground, underlain by Oxford Clay. TCL's Report found the ground conditions encountered generally comprised of Made Ground, underlain by Oxford Clay (Peterborough Member). Localised alluvium deposits were noted in TP02 and TP03, west of the site. ESI Report states the non-landfill areas (i.e. access road, weighbridge and offices) are underlain either by up to 20m of clay, or by made ground resulting from the adjacent brick working activities, which likely to comprise dominantly clay. The low permeability, thickness and attenuating properties of the clay provide considerable protection to the underlying ground. **Hydrogeology** The underlying bedrock (Oxford Clay) is designated as an unproductive aquifer, rock layers with low permeability that have negligible significance for water supply or river base flow. According to JPG's Report, there are no active recorded groundwater abstraction licences within 1km of the Site, no portable water abstraction licences within 2km and no Source Protection Zones (SPZ) within 500m. **Hydrology** The nearest recorded surface water is Elstow Brook immediately north of the Site. It is culverted beneath the western site area and is present as an open channel off-site to the north and south. The brook flows north, connecting to the River Great Ouse 2km north of the Site. The brook appears to have been modified over time and is connected to Stewartby Lake around 600m to the South. Stewartby Lake is a former flooded brick pit and used as a recreational area. According to JPG's Report, there are three active discharge consents to Elstow Brook or a tributary thereof. No active recorded surface water abstraction licences within 1km. The Site lies within a Flood Zone 2 and the western site area surrounding Elstow Brook is classified as a Flood Zone 3. Onsite risk from rivers and sea is medium and low. JPG's site investigation encountered groundwater in the majority of the exploratory holes.

	TCL's Phase 2 Ground Investigation encountered perched groundwater (TP02, TP03, TP05, TP06, TP07, TP08 and TP09).
Pollution history including: pollution incidents that may have affected land historical land-uses and associated contaminants any visual/olfactory evidence of existing contamination evidence of damage to pollution prevention measures	**Site History** JPG's Report provides a summary of the Site history. From 1882 the site comprised undeveloped fields with internal field boundaries and a circular pond situated in the centre of the site. A stream / river flows from south to north across the western part of the site, with a footpath shown to cross the stream onsite. A brickfield is located offsite to the north east. The site largely remains unchanged until 1900 when the brick works extends into the eastern site area. By 1926 the buildings relating to the onsite clay pit are no longer present and a small circular pond is shown within the eastern site area. Between 1926-1948 railway tracks extend into the site from the railway to the east and the surface water course has been diverted. By 1959 the watercourse is no longer showing abutting the railway line. Between 1975-1976 a travelling crane is shown along the southern site boundary and the site remains fairly uncharged. According to TCL's Phase 2 Ground Investigation the Site currently comprises redundant railway sidings and undeveloped land, generally surfaced with concrete hardstanding and/or ballast. General detritus including plastic piping, bricks and assorted materials are present across the site. **Potential Pollution** According to JPG's Report the Site is not in an area for which a Coal Mining Report is required. The whole site is indicated to comprise 'historic surface ground workings' relating to clay extraction. Historic maps indicate the presence of clay pits encroaching onto the Site's eastern boundary. The Site is located within the Great Ouse Nitrate Vulnerable Zone (NVZ) for surface water. These are classified as surface waters which could be polluted by agricultural sources. There are four pollution incidents recorded within 250m of the Site. There are three historic landfill sites within 1km: Stewartby Bedfordshire onsite, Stewartby Landfill located immediately northwest of the Site and Rookery Clay Pit located 900m south of the Site. Other authorisations within the area include, Veolia ES (UK) Limited located 260 m southwest and Stewartby Leachate Treatment Plan located 10m south. The Site is not in a radon affected area. The adjacent Stewartby Landfill (permit reference BV4576IK) has been operational since 1976, waste deposition ceased in 2011 and the landfill is now capped with final restoration taking place. Stewartby Leachate Treatment Plant (permit reference BV0953IM) is located to the south of the Site.

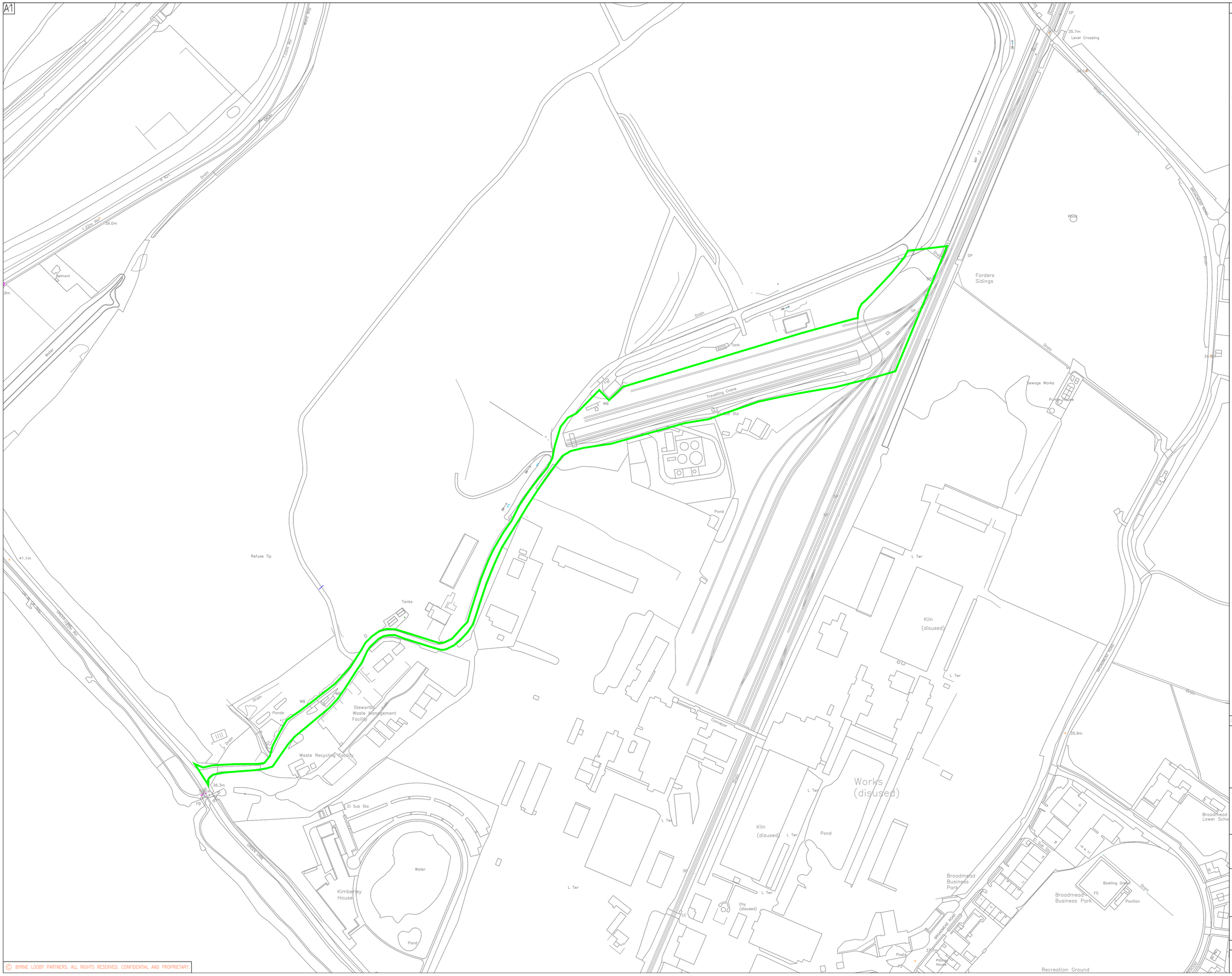
	During JPG's site investigation a leachate pipeline was encountered onsite, therefore trial pits to target the former watercourse were not completed.
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	**JPG's Site Investigation** Made Ground encountered in all trial pits. Hydrocarbon odours and/or staining were encountered at 3 locations (CP01, TP01 and TP02). None of the contaminants exceeded the Generic Assessment Criteria (GAC) criteria for commercial end use. Ten samples were laboratory screened for asbestos and one sample of made ground (TP04) identified chrysotile asbestos fibres. Four samples had calorific value tests carried out and two samples were deemed to be potentially combustible. Four samples were submitted for leachability analysis, TP01 was found to be alkaline, TP04 had elevated leachable PAH species and TP02, TP04 and TP09 had elevated leachable fluoranthene when compared to Drinking Water Standards (DWS). One groundwater sample was analysed (CP02) and found elevated concentrations of PAHs and sulphate when compared to DWS. However, risk to controlled waters considered low due to the presence of cohesive barriers and the absence of nearby receptors. Gas was monitored during 6 visits; no methane was detected but carbon dioxide was detected >5% in CP03. It was noted that CP03 had a high organic matter content of 12% and a calorific value of 16.1 MJ/kg which may result in the elevated readings. Characteristic Situation 2 (low risk) is considered applicable for the Site and gas protection measures will be required in new buildings. Nine samples classed as non-hazardous and two samples classed as hazardous or potentially hazardous due to elevate pH levels (11.6 TP01 and 11.1 TP06). **TCL's Phase 2 Ground Investigation** Made Ground was encountered in all trial pits. No olfactory evidence of contamination was observed during the ground investigation. A total of 24 samples of soil were tested. None of the contaminants exceed the GAC criteria for commercial end use. Five samples of Made Ground were laboratory screened for asbestos; no asbestos was identified. On this basis there is no evidence to suggest the previous land use has contaminated the underlying clay deposit.
Baseline soil and groundwater reference data	Baseline soil data provided in JPG's Report and TCL's Phase 2 Ground Investigation. Baseline groundwater data and gas data provided in JPG's Reports.
Supporting information	Source information identifying environmental setting and pollution incidents Historical Ordnance Survey plans Site reconnaissance Historical investigation / assessment / remediation / verification reports Baseline soil and groundwater reference data

2.3 H5 Section 3

3.0 Permitted activities	
Permitted activities	Proposal to operate an Inert and Excavation Waste Transfer Station. Inert and non-hazardous excavation, construction and demolition materials will be imported via train transferred to road wagons and exported for off-site disposal or recovery. The unloading and loading will be undertaken on a concrete pad with sealed drainage which may also be used for temporary storage in the unlikely event that materials cannot be transferred immediately to the road wagons. No treatment activities are proposed. Max amount of waste to be accepted is 750,000 tonnes per annum
Non-permitted activities undertaken	N/A
Document references for: • plan showing activity layout; and • environmental risk assessment.	K0157/1/002 – Site Layout Plan K0157/1/003 – Sensitive Receptor Plan Environmental Risk Assessment (reference: 14-K0157-ENV-R-00003)

Appendix A – Drawings

A1



GENERAL NOTES

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM.

2. DO NOT SCALE FROM THIS DRAWING.

3. ANY ANOMALIES IDENTIFIED WITH THE DETAILS SHOWN ON THIS DRAWING ARE TO BE BROUGHT TO THE ATTENTION OF BYRNE LOOBY PRIOR TO CONSTRUCTION WORKS COMMENCING.

LEGEND:

PERMIT BOUNDARY

Rev	Date	Description	By	Chk	App

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CLIENT
FCC

PROJECT
STEWARTBY

DRAWING TITLE
WTS PERMIT BOUNDARY

STATUS
FINAL

Date: 23.06.22	Scale: 1:2000	Drawn: JM	Chk: MR	App: JB
Project No.: K0157	Drg. No.: K0157.1.001			Rev: 00

Appendix B – Geoenvironmental Desk Study and Ground Investigation

GEOENVIRONMENTAL DESK STUDY AND GROUND INVESTIGATION REPORT

Former Shanks Sidings
Stewartby
Bedford

Reference	**5112-JPG-XX-XX-RP-G-0602-S2-P01**
Date	**April 2019**
Author	**MP**

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APPENDICES

Appendix A Figures/Drawings

CONFIDENTIALITY STATEMENT

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This report has been prepared for the sole use and reliance of the above-named parties. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

Rev	Date	Revision Details	Status	Author(s)	Approved
P01	26.04.2019	First Issue	Information	MP	

EXECUTIVE SUMMARY

Site Address	Former Shanks Railway Sidings, Stewartby, Bedford
NGR	501689 243137
Current Site Use & Proposed Development	The site is currently unoccupied, comprising redundant railway sidings and associated derelict land. The proposed development is for a commercially driven end use, to comprise B1/B2/B8 development areas.
Site History	The early historical plans show the site to comprise undeveloped fields, with the eastern area occupied by a brickfield. A stream/river flows across the western site area. The site remains fairly unchanged until the mid-1940s when railway sidings occupied much of the site area, which remain today.
Site Setting	**Geology** – The GS report and geological maps state that made ground will be present onsite. The site is shown to be directly underlain by bedrock comprising the Peterborough Member, comprising a brownish grey finely laminated mudstone. Underlying the Peterborough Member is the Kellaways Sand Member. **Mining –** The site is not located within a Coal Mining Reporting Area. The whole site is indicated to comprise 'historic surface ground workings' relating to clay extraction. **Hydrogeology** – The underlying bedrock is designated as an unproductive aquifer. **Hydrology** – The nearest recorded surface water is Elstow Brook located immediately north of the site. The site is located within Flood Zone 2 and partially within Flood Zone 3. **Landfill** – There is one active landfill within 500m of the site, located immediately off-site to the north: Stewartby Landfill. **Radon Risks** – The property is not in a Radon Affected Area.
Environmental Risk Assessment	Based on the identified potential sources of contamination and available pathways and receptors, the following potential linkage assessments have been considered. This assessment is based on current site conditions and does not consider exposure pathways following any remediation of the site. **Construction and Maintenance Workers -** There is the potential for exposure to hazardous gases. There is also a potential for exposure to groundwater containing isolated elevated concentrations of heavy metals, PAHs and sulphates. There is potential for exposure to potentially airborne asbestos fibres. **Future Site End Users –** There is the potential for exposure to hazardous gases. There is also potential for exposure to groundwater containing elevated concentrations of heavy metals, PAHs and sulphates. There is potential for exposure to potentially combustible made ground. **Buildings and Services –** There is potential for exposure to potentially aggressive ground and elevated concentrations of sulphates within the groundwater. **Controlled Waters -** Based on the encountered elevated concentrations of heavy metals, PAHs and sulphates within the groundwater, there is a potential for nearby surface waters to be impacted. Based on the above factors, i.e. the presence of cohesive deposits which will act as a barrier to limit the migration of potential contaminants and absence of significant nearby receptors, it is concluded that there are no plausible linkages to controlled water receptors. Therefore, the risk to controlled waters is considered to be very low. **Mitigation Measures** **Construction and Maintenance Workers -** In order to mitigate the risks posed by the potential contamination present on the site, site workers involved in groundworks should take the necessary measures to ensure that all works in excavations and confined spaces are carried out in accordance with best practice in order to prevent exposure to potentially hazardous gases and vapours. Site workers involved in groundworks should use appropriate PPE, i.e. overalls and gloves and where appropriate facemasks. Appropriate health and safety measures, e.g. washing hands prior to eating or drinking, should also be enforced. In order to protect against the inhalation of asbestos fibres during the construction and maintenance periods the contractor should provide a soils risk assessment and that employees should also receive asbestos awareness training in order to avoid exposure. In order to inform the soils risk assessment, air monitoring for asbestos fibres may be required. Any monitoring and analysis of asbestos in air should be carried out in accordance with the Control of Asbestos Regulations (CAR) 2012 and by a suitably accredited organisation (ISO/IEC 17025:2005). If air monitoring is to be carried out as the main source of air concentration data for exposure estimation, then some monitoring should be carried out during periods of dry weather, i.e. when dust is being generated. During development of the site, all workers should remain vigilant to the possible risk of encountering areas of potentially contaminated material. Should potentially contaminated material be encountered, site management should be informed. Further testing may then be required to assess the risk to health and safety of the site workers and the environment. All employers involved in works at the site should produce an appropriate method statement and risk assessment, to which all employees should comply. Reference should also be made to appropriate HSE and other guidance for working on contaminated and potentially contaminated sites. **Future Site Users -** It is likely that a commercial development will include areas of hardstanding and soft landscaping. It is recommended that a sufficient thickness of clean cover is placed within soft landscaped areas, in order to isolate potential contaminants, i.e. asbestos fibres, in the underlying made ground. The provision of a suitable growing medium may also be required in order to promote plant growth within

	areas of landscaping. The results of the gas monitoring have been assessed in accordance with BS8485:2015, 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.' Gas Characteristic Situation 2 has been determined for the site, based on the readings obtained during six visits within three monitoring wells. Mitigation measures will be required in order to prevent the ingress of hazardous ground gases into buildings. This is likely to include a gas resistant membrane. It is recommended that additional ground gas monitoring is undertaken prior to development in order to confirm the ground gas regime. No shallow made ground soils with elevated calorific value (>2MJ/kg) should remain within 1m of finished ground level in any soft landscaped area. Confirmatory testing may be required as part of any earthworks in order to confirm that the soils retained within 1m of the finished surface are not potentially combustible. A Remedial Strategy Report is likely to be required for the site. It is recommended that concrete should be designed to Aggressive Chemical Environment for Concrete (ACEC) Design Sulphate Class DS-3 and ACEC Class AC-3, in accordance with BRE Special Digest 1: 2005, entitled 'Concrete in Aggressive Ground'.
Fieldwork	Trial pits were advanced to provide a general site coverage, to target potential sources of contamination associated with the previous on-site uses and enable bulk samples to be obtained for testing. Cable percussive boreholes were advanced to provide a general overview of ground conditions to depths of approximately 6m. Gas and groundwater monitoring wells were installed in the cable percussive boreholes in order to assess the ground gas and groundwater regime in both the made and natural ground beneath the site.
Ground and Groundwater Conditions	Made ground was encountered within all exploratory locations and was confirmed to depths of between 0.45mbgl and 3.50mbgl, generally encountered at depths less than 2.0mbgl. The made ground typically comprised surfacing of concrete, bituminous hardstanding or railway ballast underlain by brick fill, with a gravel of coal and clinker; a granular unit comprising loose dark blackish grey gravelly sand with a gravel of coal and clinker and a cohesive unit comprising soft to firm light grey clay. The underlying natural strata comprises firm to very stiff dark grey fossiliferous thinly laminated clay of the Lower Oxford Clay Formation. The unit was found to underlie the reworked natural strata in 11 locations, and identified to directly underlie the made ground in all exploratory locations. The unit included abundant shelly fragments including ammonites, bivalves and gryphaea.
Geotechnical and Engineering Assessment	**Foundations -** Any made ground/topsoil would be unsuitable for the support of structural loads due to variations in material properties. If shallow spread foundations were to be used within any made ground, the underlying materials would become overstressed, leading to significant settlements. It is therefore recommended that foundation loads are transferred to natural strata of suitable bearing capacity, i.e. the Lower Oxford Clay. For preliminary design considerations, an allowable bearing capacity of 100kN/m2 could be assumed for a square pad foundation bearing onto the firm/stiff clay. Additional ground investigation will be required once a development layout has been confirmed for the site, in order to facilitate more detailed foundation recommendations. **Earthworks –** Based on the ground conditions encountered in the trial pits, the stability of the shallow made ground is considered poor. **Roads, Pavements and Hardstanding Surfaces** – Any earthworks carried out as part of the redevelopment works may result in changes to the subgrade materials. The works should therefore be designed to achieve a suitable CBR value for the proposed development. **Excavations -** Based on the ground conditions encountered in the trial pits, the stability of the shallow made ground is considered poor. **Obstructions** – Based on the history of the site the presence of significant sub-surface obstructions are likely to be present across the site. **Chemical Attack on Buried Concrete** - It is recommended that concrete should be designed to ACEC Design Sulphate Class DS-3 and ACEC Class AC-3.
Hazardous Gas	The results of the gas monitoring have been assessed in accordance with BS8485:2015. Gas protective measures in line with Characteristic Situation 2 will be required. However, further ground gas monitoring will be required in order to confirm this assessment. No radon protective measures are required.
This sheet is intended as a summary only of the assessment of the site in relation to ground condition. It does not provide a definitive engineering analysis.	

1.0 INTRODUCTION

1.1 Instruction

JPG (Leeds) Limited (JPG) has been instructed by Cloud Wing (UK) Ltd and Renewi PLC to carry out a combined geoenvironmental desk study and preliminary ground investigation for a proposed development at the former Shanks Railway Sidings, Stewartby, Bedford.

1.2 Objectives

The main objective of the geoenvironmental desk study and ground investigation is to identify potential geotechnical and environmental issues that may represent constraints to the proposed redevelopment of the site.

1.3 Scope of Works

The scope of works for the desk study included the following:

- Site description and site inspection.
- Review of contemporary and historical Ordnance Survey publications.
- Consultations with regulatory authorities.
- Review of geological publications (including hydrology, hydrogeology and soil survey publications where appropriate).
- Review of the radon status of the site.
- An environmental database search.
- Review of any previous reports provided.
- Recommendations for further work where appropriate; and
- Presentation of the findings in a tabular non-technical summary.

The scope of the ground investigation included the following reporting:

- A description of the ground investigation works carried out, i.e. factual reporting.

Interpretative reporting, including:

- Assessment of potential contaminants using generic assessment criteria specific to the proposed end use.
- A qualitative (Tier 1) screening assessment using source-pathway-receptor linkages.
- An assessment of the classification of materials for disposal off-site (not including WAC testing).
- Engineering assessment to include recommendations with respect to foundations, ground floor and pavement design.

- Comments on the likely requirements for remedial measures on the site, to address potential contamination or ground gas issues.
- Recommendations for further work where appropriate; and,
- Presentation of the findings in a tabular non-technical summary.

1.4 Location

The former Shanks sidings, 'the site', is located approximately 6.5km southwest of Bedford city centre and to the northwest of Stewartby Village, a 'model village' originally built for employees of the London Brick Company. The approximate centre of the site is located at NGR 501689, 243137.

A site location plan is presented as Figure 1 in Appendix A.

1.5 Site Description and Topography

An initial site visit was undertaken by JPG on 23 January 2019 in order to agree exploratory hole positions.

The site is approximately rectangular shape and occupies an area of approximately 2.9ha. The site is generally level with an typical elevation of 35.50 metres above ordnance datum (m AOD).

The site currently comprises redundant railway sidings and undeveloped land, generally surfaced with concrete hardstanding and/or ballast. General detritus including plastic piping, bricks and assorted materials are present across the site.

Two redundant travelling gantry cranes are located in the east and west of the site, situated at either end of a concrete roadway. The roadway extends roughly parallel to the southern site boundary.

The site is generally open on all boundaries. To the immediate east of the site is the Marston Vale railway line, which remains operational and connected to the on-site redundant sidings. To the immediate south of the site is the FCC Environmental Ltd Leachate Treatment Plant. Beyond this there is the former Stewartby Brickworks which is also derelict. An electricity substation is also present to the immediate south of the site. To the west and northwest of the site is Stewartby Landfill, also operated by FCC Environmental Ltd. The landfill is currently undergoing restoration through the addition of capping soils and introduction of vegetation.

A storage warehouse and former oil storage area is located immediately beyond the northern boundary. Along the northern boundary, between the site and Stewartby Landfill is Elstow Brook which flows from west to east.

The site is accessed from Green Lane via the entrance to Stewartby Landfill towards the western end of the site.

An aerial photograph of the site is presented as Figure 2 in Appendix A.

Photographs 1-6 are provided in Appendix B and show the general site area prior to investigation.

1.6 Development Proposals

No development proposals have been provided for the site. However, the scope of works was based upon B1 (Business), B2 (General Industrial) or B8 (Storage and Distribution) commercial end-uses at the request of the client.

1.7 Previous Reports

A previous geoenvironmental desk study assessment for the overall Stewartby former brickworks site, which incorporated the former Shanks Sidings, has been undertaken by JPG, and is referenced below:

- JPG (Leeds) Ltd. Geoenvironmental Desk Study Report. Planning Application No.2, Stewartby, Bedford. Ref. MHP/DS/PA2/5112.v3 dated November 2018.

1.8 Limitations

The general limitations to the nature of the investigation are outlined in Appendix I.

2.0 SITE HISTORY

Historical plans for the site were obtained from GroundSure (GS). These have been reviewed in order to establish any former uses of the site and identify any potentially contaminative historical uses, or potential geotechnical constraints to the proposed development. A summary of the relevant map information is presented in Table 2.0 and copies of relevant plans are presented in Appendix C.

Table 2.0 – Summary of Relevant Historical Map Information

Date(s) & Scale	Features
1882 **1:10,560** **1883** **1:2,500**	**The site comprises undeveloped fields with internal field boundaries. The eastern site area is situated on the periphery of a brick field, which is located off-site to the northeast. A circular pond is situated in the centre of the site. A stream/river flows from south to north across the western part of the site, with a footpath (FP) shown to cross the stream on-site.** Beyond the north-eastern boundary is a brick field, brick kiln and several related buildings. Beyond this there is a railway line orientated northeast/southwest situated on an embankment (known today as the Marston Vale line). Randall's Sidings are located to the east of the railway. To the north, west and southwest of the site is generally agricultural land. Wootton Broadmead, a village, is located approximately 400m east, comprising several buildings. Vicarage farm is located approximately 500m northwest.
1900 **1:10,560** **1901** **1:2,500**	**The brick field has further extended into the eastern site area is now labelled as part of a 'Brick Works'. The remainder of the site appears unchanged.** Approximately 500m south of the site is a brick works, to the immediate west of the London & North Western Railway. The brick works comprises a clay pit extending west, with associated buildings (presumed kilns). Several minor water features are present in the vicinity of the brick works, connecting to the clay pit. The remaining surrounding area appears fairly unchanged.
1926 **1:2,500** **1938** **1:10,560**	**The buildings relating to the on-site clay pit are no longer shown. An additional small circular pond is shown within the eastern site area. The remainder of the site appears unchanged.** The brickworks to the south 'Pillinge Brick Works' have undergone extensive development. The clay extraction pit has extended further north, west and south towards Green Lane. An engine house is located approximately 700m south of the site, within the centre of the clay extraction pit. Stewartby village, approximately 1km southeast of the site, is undergoing development. Several residential streets, a recreation ground and allotment gardens are shown. A tramway is shown within the clay extraction area. Several brick works have been developed within 2km between 1926 and 1938. By 1938, Stewartby brick works has extended to the east of the railway line.
1946 to 1948 **1:10,560**	**Railway tracks extend into the site from the railway to the east. The tracks extend off-site to the south, linking to Stewartby brickworks in the south. The tracks appear to cross the area previously noted as a clay pit. The surface water course appears to have been diverted.** Much of the immediate surrounding areas remain unchanged, with some slight extension to the Pillinge Brick Works clay extraction pit.
1959 **1:10,560**	**The site remains fairly unchanged; however, the water course is no longer shown abutting the railway line. Railway sidings remain present across the site.** The brick works to the south comprise several kiln structures with associated chimneys. The clay pit is shown to decrease in size, potentially being infilled.
1975 to 1976 **1:2,500**	**A travelling crane is shown along the southern site boundary. In general, the site remains fairly unchanged and comprises railway sidings.** An electricity sub-station is shown on the southern boundary. Immediately beyond the southern boundary, the brickworks comprise several kilns, chimneys, ropeways and other associated brick works infrastructure. The water course is shown to the west of the site, flowing parallel to the south boundary approximately 100m north of the site, flowing from west to east.
1980 **1:10,560** **1989** **1:10,000**	**The site remains unchanged and comprises railway sidings.** To the north and northwest of the site is a 'pit' labelled as disused, occupying the area between the site and Bedford Road. Tanks are now shown within the Stewartby brick works to the south.
1993 **1:2,500**	**The site remains unchanged.** The land shown on 1980 mapping as a disused pit is now shown as a refuse tip.
2002 **1:10,000**	**The site remains unchanged.** To the north of the site, infilled ground is shown in the location of the landfill.
2010 **1:10,000**	**The site remains unchanged.** The site remains unchanged.
2014 **1:10,000**	**The site remains unchanged.** To the immediate south of the site is a leachate treatment plant.

3.0 SITE SETTING

3.1 Recorded Geology

The GS Report and the following geological publications have been consulted:

- British Geological Survey, Sheet 203, Bedrock and Superficial, Bedford, 1:50,000 scale, published 2010.
- British Geological Survey. Geology of the Bedford District: a brief explanation of the geological map sheet 203 Bedford, 2010.
- British Geological Survey. Lexicon of Named Rock Units.

The site is shown to be underlain by made ground along the northern and southern boundaries. The geological map indicates the surrounding area to comprise large areas of worked ground, which is made ground associated with the filling of former clay extraction pits.

The site is not shown to be underlain by superficial deposits.

The site is shown to be directly underlain by bedrock comprising the Peterborough Member (PM), forming part of the lower Oxford Clay Formation (OCF). The PM generally comprises *'brownish grey finely laminated organic-rich ("bituminous") mudstones with subordinate beds of grey blocky mudstone'*. Bands of *'cementstone nodules/ concretions'* have been identified throughout the unit. The unit is recorded to comprise fossil fauna including ammonites, bivalves and localised shell-beds.

The PM unit is recorded to have been the targeted unit for quarrying to provide resource for brick manufacturing across the region. The unit has been recorded within the Stewartby area at a maximum thickness of 23m.

Underlying the PM is the Kellaways Sand Member (KSM), forming part of the upper Kellaways Formation (KF). The KSM generally comprises *'greenish grey fine-grained sandstone and siltstone interbedded with mudstone'*. The sandstone is recorded to be very weakly cemented and often recovered as a weathered unit comprising a *'pale loamy soil'*. The lower unit of the KF comprises the Kellaways Clay Member (KCM). The KCM generally comprises *'slightly fissile dark grey mudstone, weathering to a smooth pale grey clay'*.

Forming the base of the KF is the Cornbrash Formation (CF). This unit comprises a thin unit (~2 - 4m) of limestone signifying the top of the Great Oolite Group. The CF generally comprises *'bluish grey medium to fine-grained bioclastic wackestone and packstone, with excessive bioturbation with rare interbeds of mudstone'*. The unit weathers a yellowish-brown colour.

No faults are recorded within 250m of the site.

Historical borehole records have been obtained from the BGS GeoIndex Onshore website, a summary of three nearby boreholes is provided below. Copies of the borehole logs are presented in Appendix D and the borehole locations are included on the exploratory hole location plan presented as Figure 3, Appendix A.

Great Ouse Site Investigation. Borehole reference: TL04SW239 (1968)
Located approximately 25m northeast of the site.

Depth (m bgl)	Geology
Surface (34.5m AOD) to 19.20 m bgl.	
Surface to 0.38m	Made ground: Brick rubble.
0.38m – 2.74m	Medium to stiff orange brown and grey silty clay (PM).
2.74m – 17.37m	Very stiff - hard medium grey silty clay with numerous soft shells. Very strongly laminated horizons and defoliates on drying. Some fissuring (PM). Water seepage at 5.4m.
17.37m – 19.20m	Compact very slightly clayey fine sand with clay seams (KSF).

Vicarage Farm and L Field. Borehole reference: TL04SW42 (1939)
Located approximately 30m west of the site.

Depth (m bgl)	Geology
Surface to 21.11 m bgl.	
Surface to 4.06m	Soil and brown weathered clay with traces of selenite.
4.06m – 17.78m	Stiff blue-grey laminated clay (PM).
17.78m – 21.11m	Dense blue-grey sand and clay (KF).

Elstow. Borehole reference: TL04SW259 (1972).
Located approximately 400m southeast of the site.

Depth (m bgl)	Geology
Surface (34.88m AOD) to 31.00 m bgl.	
Surface to 0.7m	Hard grey/brown sandy clay with a fine gravel.
0.7m – 1.4m	Soft brown sandy silty clay.
1.4m – 18.8m	Stiff becoming hard with depth, dark grey fissured laminated silty clay with some shells. (PM)
18.8m – 20.9m	Very dense grey fine silty sand. (KSM)
20.9m – 23.4m	Hard dark grey laminated silty clay. (KCM)
23.4m – 25.2m	Moderately weak grey shelly limestone with a clay band. (CF)
25.2m – 27.1m	Hard dark grey laminated silty clay becoming light grey and sandy at depth.
27.1m – 31.0m	Moderately strong grey shelly oolitic limestone; very shelly bands with clay pellets and lenses.

In summary, the boreholes within the vicinity of the site confirm a sequence including PM down to a maximum of 18.8m bgl, the KSM down to a maximum of 23.41m bgl with the limestone units beneath. These records confirm the anticipated sequence of strata below the site.

3.2 Mining and Ground Workings

The site is not in an area for which a Coal Mining Report is required.

The whole site is indicated to comprise 'historic surface ground workings' relating to clay extraction. Historical OS maps indicate the presence of clay pits encroaching onto the site's eastern boundary.

3.3 Hydrogeology

The underlying bedrock (OCF) is designated as an unproductive aquifer. An unproductive aquifer is described as '*rock layers with low permeability that have negligible significance for water supply or river base flow*'.

There are no active recorded groundwater abstraction licences within 1km of the site.

There are no active potable water abstraction licenses within 2km of the site.

The site does not lie within 500m of an Environment Agency Groundwater Source Protection Zone.

3.4 Hydrology

The nearest recorded surface water is Elstow Brook located immediately north of the site. Elstow Brook is culverted beneath the western site area and is present as an open channel off-site to the north and south. The brook is indicated to flow north, connecting to the River Great Ouse 2km north of the site. The brook appears to have been extensively modified over time and is connected to Stewartby Lake 700m to the south.

There are three active licensed discharge consents to surface water within 500m of the site, all pertaining to Elstow Brook (or a tributary thereof). These consents are outlined below:

- British Railways hold a discharge consent for the discharge of sewage/final treated effluent into Elstow Brook approximately 40m northeast of the site. The license was issued in 1993.
- A workshop holds a discharge consent for the discharge of sewage/ final treated effluent into Elstow Brook 40m north of the site. The license was issued in 1992.
- Broadmead Farmhouse holds a discharge consent for the discharge of sewage/ final treated effluent into Elstow Brook 350m northeast of the site. The license was issued in 1998.

There are no active recorded surface water abstraction licences within 1km of the site.

Information on the EA website and presented in the GS report indicates that the site lies within Flood Zone 2. For a Flood Zone 2, the annual probability of flooding from rivers is between 1 in 1000 (0.1%) and 1 in 100 (1%).

The area surrounding the culverted Elstow Brook beneath the western site area, is classified as a Flood Zone 3. For a Flood Zone 3, the annual probability of flooding from rivers is between 1 in 100 (1%).

The on-site risk of flooding from Rivers and the Sea (RoFRaS) is 'medium and low'.

A flood risk assessment may be required by the Local Authority as part of any planning application for the site.

3.5 Environmental Designations

The site is classified by DEFRA to be located within the Great Ouse Nitrate Vulnerable Zone (NVZ) for surface water. These are classified as surface waters which could be polluted by agricultural sources.

3.6 Pollution Incidents

There are four recorded Environment Agency (EA) recorded Pollution Incidents within 250m of the site which were classified to have made an impact to land and/or water and/or air. These are summarised in Table 3.5 below.

Table 3.6.1 – Summary of Environment Agency Recorded Pollution Incidents

Distance & Direction	Incident Date	EA Incident Identification Number	Pollutant	Impacts
125m East	18-JUN-2001	9912	Sewage Materials: Sludge	Water Impact: Cat 2 (Significant) Land Impact: No Impact Air Impact: No Impact
250m West	02-JAN-2002	50319	Atmospheric Pollutants and Effects: Landfill Odour	Water Impact: No Impact Land Impact: No Impact Air Impact: Cat 3 (Minor)
250m West	08-JAN-2002	51143	Atmospheric Pollutants and Effects: Landfill Odour	Water Impact: No Impact Land Impact: No Impact Air Impact: Cat 3 (Minor)
250m Northeast	09-MAY-2002	77585	Sewage Materials: Crude Sludge	Water Impact: Cat 2 (Significant) Land Impact: No Impact Air Impact: No Impact

Two EA pollution incidents are recorded to have made a significant impact to waters within 250m of the site and two incidents within 250m of the site are recorded to have made a significant impact to the air. There are no records within 250m suggesting any pollution incidents to land.

3.7 Landfill and Waste

The GS report includes information on active and former landfill sites supplied by the Environment Agency, Landmark, Local Authority and the BGS.

There is one active landfill located within 1km of the site, which is located immediately northwest of the site at Stewartby Landfill, access to which is shared to gain access to the site. Stewartby Landfill occupies an area of approximately 77ha.

JPG liaised with the EA to obtain additional information on Stewartby Landfill. Pertinent information provided is summarised below.

- Stewartby landfill is recorded to be capped and is undergoing a 'restoration' scheme.
- An FCC Environmental Ltd Annual Environmental Monitoring Review covering the time between February 2017 and January 2018 was provided by the EA.
- Monitoring of 83 perimeter ground-gas boreholes around Stewartby Landfill is undertaken on a monthly basis and compared against trigger levels/ compliance levels agreed with the EA/ Local Authority for the landfill.
- 33,289m^3 of leachate was removed from the landfill and treated within the Marston Vale leachate treatment plant.
- Groundwater is sampled quarterly from 25 boreholes, during which the following breaches were noted:

  Four breaches of Mecoprop ranging between 0.12 µg/l - 5.53µg/l (compliance of 0.10µg/l).

  One breach of Nickel within the treated leachate; 0.046µg/l (compliance of 0.02µg/l).

  One breach of Ammoniacal Nitrogen within the leachate; 5 N:mg/l (compliance of 2.44 N:mg/l).

  No breaches of cadmium, chloride or naphthalene were noted.
- Surface water samples are taken on a monthly basis, the report covering 2017/2018 reports no breaches.
- Groundwater levels have been monitored within the Kellaways Sands and Blisworth Limestone stratum.
- The 2017 report concludes that '*Stewartby landfill has had a negligible impact on the nearby environment. The local geology surrounding Stewartby is predominantly Oxford Clay Fm with very low permeability which provided a very good containment*'.

There are three records for Environment Agency historic landfill sites within 1km of the site. These are summarised in Table 3.6.1 below.

Table 3.7.1 - Summary of Historical Environment Agency Landfill Sites

Distance & Direction	Site Address	Operator	Waste Type	Licence Dates
On-site	Stewartby Bedfordshire	London Brick Company	Unknown.	Unknown.
Immediately north-west	Clay Pit known as L Field Stewartby (Stewartby Landfill)	London Brick Landfill Ltd	Inert, Industrial Commercial, Household	Issued: 29-JUN-1984 Surrendered: 06-NOV-1986
900m South	Rookery Clay Pit, Stewartby, Bedford	London Brick Land Development Limited	Industrial Household, Liquid Sludge	Issued: 05-DEC-1977 Surrendered: 28-APR-1987

The London Brick Company is recorded to have operated a landfill partially on-site. The EA were contacted to obtain more information on the landfill. However, they held no further details.

The Rookery Clay Pit is recorded to have historically operated a landfill approximately 900m south. JPG engaged with the EA to obtain additional information on Rookery Clay Pit. Pertinent information provided is summarised below.

- Rookery North Pit was partially backfilled during the period from circa. 1971 to 1997.
- Rookery North Pit was licenced as a 'co-disposal landfill' in which non-hazardous organic waste from industrial sources were mixed with surface waters from the Rookery Pit, with 'Callow' deposits pumped into the base of the pit.
- The Rookery North Pit is shown to relate to the original London Brick Landfill Ltd agreement, which indicated landfilling of non-notifiable mineral wastes (including neosid ferrite sludge, lime and water from water softening treatments and Hargreaves fertiliser waste), food wastes (from Coca Cola, Rosa Poultry, Telfers and Unilever), leather wastes and gelatine wastes from 'Croda'.
- Intrusive investigation was undertaken within the areas of historical fill and indicate that widespread contamination has not occurred as a result of the landfilling activities.
- Rookery South Pit with Comprising Callow Clay fill within the base, which is sludge clays which aren't suitable for brick making.

3.8 Environmental Permits, Incidents and Registers

There are several Integrated Pollution Control (IPC) authorisations within 500m of the site, all pertaining to Hanson Brick Ltd/ Hanson Building Products Ltd for the process of ceramic production. One authorisation remains valid, all others have been superseded by variation of permit. This is detailed in Table 3.7.1 below.

Table 3.8.1 – Valid Integrated Pollution Control (IPC) authorisations within 500m

Distance (m) & Direction from the site	Operator	Process	Permit Number	Status
450 Southeast	Hanson Brick Ltd	Ceramic Production	BU8444	Valid

There are several records of Part A(1) and IPPC Authorised activities within 500m of the site, of which seven are 'effective'.

Table 3.8.2 – Effective Part A(1) and IPPC Authorised activities within 500m

Distance (m) & Direction from the site	Operator	Installation Name	Process	Permit Number	Status
260m Southwest	Veolia Es (uk) Ltd	Stewartby Waste Management Facility	Temporary storage of hazardous waste with a total capacity >50 tonnes	UP3235AA	Effective
260m Southwest	Veolia Es (uk)	Stewartby Waste Management Facility	Associated Process	UP3235AA	Effective
260m Southwest	Veolia Es (uk) Limited	Stewartby Waste Management Facility	Disposal or recovery of hazardous waste with capacity exceeding 10 tonnes per day involving blending or mixing	UP3235AA	Effective
20m North	Fcc Waste Services (uk) Limited	Stewartby Landfill	Waste landfilling >10 T/D with capacity >25,000T excluding inert waste	BP35533A B	Effective
20m South	Fcc Waste Services (uk) Limuited	Stewartby Leachate Treatment Plant	Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving biological treatment.	RP3334DA	Effective
20m South	Fcc Waste Services (uk) Limuited	Stewartby Leachate Treatment Plant	Disposal of >50 T/D non-hazardous waste (>100 T/D if only AD) involving physico-chemical treatment	RP3334DA	Effective
20m South	Fcc Waste Services (uk) Limuited	Stewartby Leachate Treatment Plant	Disposal of >50 T/D non-hazardous waste (>100 T/D if only AD) involving biological treatment.	BV0953IM	Effective

There are no records of any active Part A(2) or Part B permitted activities within 500m of the site.

There are no recorded Water Industry Referral (potentially harmful discharges to the public sewer) within 500m of the site.

There are no Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the site.

There is one active List 1 Dangerous Substances Inventory record assigned to the site. The record is held by Shanks Waste Services Limited for authorised substances including; mercury, cadmium, hexachlorocyclohexane, carbon tetrachloride, pentachlorophenol, aldrin, dieldrin, endrin, hexachlorobenzene, hexachlorobutadiene, 1,2-dichloroethane, trichlorobenzene, Total DDT.

There are no active List 2 Dangerous Substance Inventory sites within 500m of the site.

There are no current records of Category 3 or 4 Radioactive Substances Licences within 500m of the site.

There is one (lower tier) recorded Control of Major Accidents Hazard (COMAH) within 500m of the site. The site is owned by Veolia Environmental Services (UK) Limited and is located approximately 260 metres southwest.

There are no sites determined as contaminated land under Part IIA EPA 1990 within 500m of the site.

3.9 Radon Risks

The site is not in a radon affected area, as less than 1% of properties are above the action level for radon gas. Therefore, no radon gas protective measures will be required.

4.0 Environmental Risk Assessment

4.1 Introduction

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists. Within the context of current UK legislation i.e. Part 2A of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995, the interpretation of a "significant risk" is termed to be one where:

- Significant harm is being caused, or there is a significant possibility of such harm being caused, (where harm is defined as harm to health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property); and/or
- Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm to occur requires three conditions to be satisfied:

- Presence of substances (potential contaminants/pollutants) that may cause harm (Sources);
- The presence of a receptor which may be harmed, e.g. the water environment or humans, buildings, fauna and flora (Receptors); and,
- The existence of a linkage between the Source and the Receptor (The Pathway).

In order to assess the contamination risk at the site, the above rationale has been applied and is discussed in the context of Contamination Sources and Potential Pollutant Linkages.

4.2 Potential Sources

Based on the history of the site, the following potential on-site sources of contamination may be present:

- Made ground associated with historical clay extraction operations.
- Made ground associated with the historical development on the site.
- Localised areas of fuel and oil contamination associated with the railway sidings, maintenance areas and substation; and,
- Hazardous gases associated with the backfilled brick pits/watercourses/ made ground.

Based on the history of the site and surrounding site area, the following potential off-site sources of contamination may be present:

- Localised areas of contamination associated with Stewartby landfill to the north and west; and,
- Hazardous gases associated with the Stewartby Landfill.

Potential contaminants which could be present on the site are listed below:

- Metals, metalloids and their compounds
- Inorganic compounds e.g. cyanide
- Organic compounds e.g. hydrocarbons; fuels/oils
- Polycyclic Aromatic Hydrocarbons (PAH)
- Volatile Organic Compounds (VOCs)
- Semi Volatile Organic Compounds (SVOCs)
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
- Asbestos fibres
- Hazardous gases e.g. carbon dioxide, methane
- Polychlorinated Biphenyls (PCBs)

5.0 FIELDWORK

The intrusive investigation was designed to provide a preliminary overview of ground, groundwater and hazardous gas conditions at the site.

Trial pits were advanced to provide a general site coverage, to target potential sources of contamination associated with the previous on-site uses and enable bulk samples to be obtained for testing.

Cable percussive boreholes were advanced to provide a general overview of ground conditions to depths of approximately 6m.

The rationale behind each exploratory location is summarised in Table 5.0.1 below.

Table 5.0.1 – Exploratory Hole Rationale

Potential Issue	Exploratory Holes
Exploratory hole targeting area previously shown as a clay pit and to enable the installation of ground-gas and groundwater monitoring locations.	CP01
Exploratory holes located across the site, to enable the installation of ground-gas and groundwater monitoring locations.	CP02 and CP03
Exploratory locations targeting the general site area.	TP01 to TP05
Exploratory locations targeting area previously shown as a clay pit.	TP06 to TP10

The fieldwork was carried out between 4 and 6 February 2019. The works undertaken are summarised in Table 5.0.2 below.

Table 5.0.2 – Summary of Ground Investigation Works

Investigation Method	No of Positions	Maximum Depth (m bgl)	Monitoring Wells	Monitoring
Trial Pits	10 (TP01 to TP10)	4.10	-	-
Cable Percussion Boreholes	3 (CP01 to CP03)	6.45	3 x 50mm	GG, GW, WL

bgl – below ground level
GG – ground gas monitoring (methane, carbon dioxide, oxygen, hydrogen sulphide, gas flow and atmospheric pressure using a portable gas meter)
GW – ground water monitoring.
WL – standing groundwater level using an electric contact dip meter

It should be noted that TP05 was terminated due to the presence of a leachate pipeline, and consequently two additional trial pits scheduled to target the former water courses were not completed.

The ground investigation has been undertaken in general accordance with the techniques outlined in BS5930: 2015 Code of Practice for Site Investigations at the positions shown on the Exploratory Hole Location Plan, which is presented as Figure 3 in Appendix A.

The investigation was carried out under the full-time supervision of an engineer from JPG. The Exploratory Hole Logs are contained in Appendix E.

5.1 Surveying

The exploratory locations were set out using a hand-held GPS unit. As-built locations were established using a Leica GPS unit.

An as-built exploratory hole location plan is provided as Figure 3 in Appendix A.

6.0 LABORATORY TESTING

6.1 Chemical Analysis

The chemical analysis suite was designed to:

- Characterise near surface contamination levels to provide an assessment of the risks associated with direct contact with soils onsite in its current state;
- Provide information on the general contamination concentrations in the various strata across the site;
- Characterise in detail visible or odorous contamination using targeted analytical
- Provide information on the quality of shallow groundwater beneath the site.

Chemical testing was carried out for the following determinands by Derwentside Environmental Testing Services Limited (DETS) in County Durham. Chemical analysis certificates are presented in Appendix F.

Soils – General
Selected samples of soil were tested for the following contaminants on a total concentration basis:

Arsenic	Mercury	Copper
Cadmium	Lead	Nickel
Chromium	Zinc	Selenium
Cyanide (free)	Phenol	

Speciated Poly Aromatic Hydrocarbons (PAHs)
Soil Organic Matter
Sulphate (water soluble) and pH
Asbestos Screen

In addition, selected samples were submitted for the following analysis:

- Asbestos quantification;
- Hexavalent chromium;
- Ammoniacal nitrogen;
- Total Petroleum Hydrocarbons Criteria Working Group (Ali/Aro);
- Polychlorinated Biphenyl (PCB);
- Volatile Organic Compounds (VOC) including Benzene, Toluene, Ethylbenzene and Xylene (BTEX), Methyl tert-butyl ether (MTBE) and Semi-Volatile Organic Compound (SVOC); and,
- Mecoprop (analysis used by Stewartby Landfill for compliance testing).

Selected samples of soil leachate and groundwater were tested for the following contaminants:

Arsenic	Mercury	Copper
Cadmium	Lead	Nickel
Chromium	Zinc	Selenium
Cyanide (free)	Phenol	
Speciated Poly Aromatic Hydrocarbons (PAH)		
Sulphate and pH		

In addition, selected samples were submitted for the following analysis:

- Hexavalent chromium;
- Ammoniacal nitrogen;
- Total Petroleum Hydrocarbons Criteria Working Group (Ali/Aro);
- Volatile Organic Compounds (VOC) including Benzene, Toluene, Ethylbenzene and Xylene (BTEX), Methyl tert-butyl ether (MTBE) and Semi-Volatile Organic Compound (SVOC); and,
- Mecoprop (analysis used by Stewartby Landfill for compliance testing).

6.2 Geotechnical Testing

In situ standard penetration tests (SPTs) were performed within all boreholes. The results are presented on the Exploratory Hole Logs presented in Appendix E.

Laboratory geotechnical testing was carried out by Professional Soils Laboratory (PSL) in Doncaster, in order to determine the physical characteristics of the substrata and comprised the following:

- Moisture content and Atterberg Limits testing to classify the materials;
- Particle density and particle size distribution to confirm the field descriptions of the soils encountered;
- Compaction testing (2.5kg and 4.5kg) to determine the compaction properties of the soils;
- Undrained triaxial testing to determine the strength of the material;
- Consolidation Testing; and,
- Water extract soluble sulphate, pH, total sulphur and water-soluble chloride.

The geotechnical testing was carried out in accordance with BS1377:1990, "Methods of Test for Soils for Civil Engineering Purposes". The results of the geotechnical testing are contained in Appendix G.

7.0 GROUND AND GROUNDWATER CONDITIONS

7.1 Introduction

The ground conditions encountered during the investigation were inconsistent with the anticipated sequence of strata indicated by the desk study information.

7.2 Ground Conditions

Made Ground
Made ground was encountered within all exploratory locations and was confirmed to depths of between 0.45mbgl and 3.50mbgl, generally encountered at depths less than 2.0mbgl. The base of the made ground was confirmed within 11 of the 12 exploratory locations.

A summary of the surfacing encountered is provided below:

- Reinforced concrete hardstanding was encountered within five trial pit locations (TP01 to TP04 and TP06) and all three borehole locations, at thicknesses between 0.15m and 0.35m.
- Bituminous hardstanding was encountered in one trial pit location (TP09) at a thickness of 0.10m.
- Railway Ballast was encountered within two trial pit locations and confirmed to depths of 0.15mbgl (TP08) and 0.50mbgl (TP07).

A summary of the made ground encountered is provided below:

- Brick fill comprising reddish brown sandy gravel, with frequent gravel/ cobbles of brick, clinker and coal and occasional rootlets was encountered in nine exploratory locations; TP02, TP03, TP04, TP08, TP09, TP10, CP01, CP02 and CP03 at depths between 0.10mbgl to a maximum of 1.60mbgl. In general, the brick fill was encountered at thicknesses of between 0.25m and 1.25m. The granular constituents comprised brick, coal, clinker, wood, sandstone and concrete.
- Granular unit comprising loose dark blackish grey to orangish brown gravelly sand with a gravel of coal, occasional clinker with mixed lithology was encountered in two exploratory locations, TP06 and TP10 at depths between 0.15mbgl and 1.10mbgl. A slight organic odour was noted within TP06 within this unit.
- Cohesive unit comprising soft to firm light grey mottled yellowish grey slightly sandy clay was present in 12 exploratory locations, described as 'reworked natural strata'. The base of the unit was proven within nine of the twelve exploratory locations.

Lower Oxford Clay Formation
The underlying natural strata comprises firm to very stiff dark grey fossiliferous thinly laminated clay of the Lower Oxford Clay Formation. The unit was found to directly underlie the made ground in all exploratory locations. The unit included abundant shelly fragments including ammonites, bivalves and gryphaea.

7.3 In Situ Testing

SPTs were carried out within all three cable percussive boreholes. The corrected N(60) values have been plotted against depth (m bgl). The plot is presented as Figure 4 in Appendix A and the SPT data (corrected) is included on the exploratory hole logs contained in Appendix E.

It can be interpreted from the plot that density/ strength increases with depth. Generally, low strength cohesive soils are proven at depths between 1 and 2.50mbgl. Medium strength cohesive soils are proven at depths in excess of 3mbgl and high strength, to very high strength cohesive soils are proven at depths between 4m and 6.50mbgl. Below 6mbgl, N(60) values of at least 30 can be expected (very high strength cohesive soils).

Five in-situ hand shear vane (HSV) results were obtained, with results ranging from 50 kPa to >135kPa at depths of between 0.80m and 1.00mbgl.

Five laboratory HSV results were obtained from U100 sampling tubes, with results ranging from 41kPa to 80kPa at depths of between 1.00m and 4.00mbgl.

7.4 Laboratory Testing

Moisture Content and Atterberg Limit Testing
In total, 14 samples were submitted for moisture content and Atterberg Limit testing, of which four samples were made ground and 10 samples were natural ground.
The results are summarised in Table 7.4.1 below:

Table 7.4.1 – Summary of Moisture Content and Atterberg Limit Testing

Material	Moisture Content (%)		Atterberg Limits Modified Plasticity Index (%)	
	No of samples	Range	No of samples	Range
Made Ground	4	16 – 50 (Mean 33.25)	1	13.12
Natural Ground	10	21 – 33 (Mean 27.70)	4	33 – 36.26

The plasticity indices reported have been modified based on the percentage of particles smaller than 425µm.

The result for the sample of made ground indicates that this material can be classified as being of low plasticity; this indicates a low potential for volume change.

The results for the samples of natural ground indicates that this material can be classified as being of high plasticity; this indicated a medium potential for volume change.

Calculation of the consistency index (CI) within the cohesive natural ground indicates the material is generally 'stiff to very stiff' with a mean CI of 0.98 (range 0.78 to 1.15).

Typical moisture contents in the cohesive natural ground (predominantly clay) ranged between 21% and 33%, with an average moisture content of 27.70%. Typical moisture contents in the made ground ranged between 16% and 50%, with an average moisture content of 33.25%.

A plot of Moisture Content vs. depth (m bgl) is presented as Figure 5 in Appendix A.

Particle Size Distribution Testing

Particle size distribution (PSD)/sedimentation testing was carried out on 5 soil samples, obtained at depths of between 0.30mbgl and 2.70mbgl to confirm the field descriptions of the materials. The results are summarised in Table 7.4.2 below.

Table 7.4.2 – Summary of Particle Size Distribution/Sedimentation Testing

Trial Pit	Depth (m bgl)	Material	Cobbles (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
TP01	1.50 – 1.90	Clayey Sand	0	17	52	12	19
TP03	0.70 – 0.90	Made Ground	0	68	24	8	
TP06	2.50 – 2.70	Lower Oxford Clay	0	1	4	44	51
TP09	0.30 – 0.50	Made Ground	0	57	34	9	
TP10	0.85 – 0.90	Silty Clay	0	4	50	24	22

Undrained Triaxial Testing

Five samples of the natural ground, obtained at depths of between 1.00m and 4.50mbgl, were submitted to determine the undrained shear strength in triaxial compression. The results returned undrained shear strength values ranging from 41kPa and 80kPa. The average shear strength returned at 59.84kPa. The results are indicative of medium strength soils. The results are summarised in Table 7.4.3 below.

Table 7.4.3 – Summary of Quick Undrained Triaxial Tests

Exp. Hole	Depth (m bgl)	Material (Laboratory Descriptions)	Cell Pressure (kPa)	Shear Strength (kPa)	Mean Shear Strength (kPa)
CP01	2.00 – 2.50	Firm brown mottled grey clay.	25 50 100	46 51 57	51.3
CP02	2.00 – 2.50	Stiff brown mottled grey clay.	50	80	80
CP02	4.00 – 4.50	Firm brown mottled grey clay.	100	41	41
CP03	1.00 – 1.50	Firm brown mottled grey clay.	25 50 100	48 52 54	51.3
CP03	4.00 – 4.50	Firm grey clay.	50 100 200	70 75 82	75.6

Undrained Shear Strength (Cu) has been plotted against depth, and is provided as Figure 6 in Appendix A.

Consolidation Testing

Three one dimensional consolidation tests were carried out to determine the compressibility of the soils. Results are summarised in Table 7.4.4 below.

Table 7.4.4 – Summary of One-Dimensional Consolidation Tests

Exp. Hole	Depth (m bgl)	Material (Laboratory Descriptions)	Pressure Range (kPa)	M_v (m^2/MN)	C_v (m^2/yr)
CP01	2.00 – 2.50	Firm brown mottled grey clay.	0 - 25 25 - 50 50 - 100 100 - 200 200 - 100	0.309 0.143 0.304 0.257 0.055	30.350 2.956 1.085 0.544 1.220
CP02	4.00 – 4.50	Firm brown mottled grey clay	0 - 50 50 - 100 100 - 200 200 - 400 400 - 200	0.542 0.423 0.328 0.215 0.035	37.875 0.855 0.839 0.747 1.276
CP03	1.00 – 1.50	Firm brown mottled grey clay.	0 - 25 25 - 50 50 - 100 100 - 200 200 - 100	0.905 0.762 0.679 0.493 0.047	5.203 2.470 3.102 1.550 7.805

The results indicate that the cohesive deposits are generally of high compressibility.

7.5 Groundwater

During the investigation, water strikes were encountered in majority of the exploratory holes. These are summarised in Table 7.5.1 below.

Table 7.5.1 – Summary Groundwater Levels encountered During Site Works

Exp. Hole	Groundwater Encountered
CP01	Groundwater encountered at 1.00m, rose to 0.70m after 20 minutes.
CP02	Groundwater encountered at 1.00m, rose to 0.70m after 20 minutes. Groundwater encountered at 5.30m, rose to 4.60m after 20 minutes.
CP03	Groundwater encountered at 2.00m, rose to 1.80m after 20 minutes.
TP01	Water seepage between 1.50m.
TP02	Water seepage encountered at 1.50m (grey colour).
TP03	Water seepage encountered between 0.70m and 0.90m.
TP04	Water seepage encountered between 0.40m and 1.00m.
TP05	No water encountered.
TP06	Water seepage encountered at 0.45m.
TP07	No water encountered.
TP08	No water encountered.
TP09	No water encountered.
TP10	No water encountered.

Gas and groundwater monitoring wells were installed in the cable percussive boreholes. A summary of the monitored groundwater levels is presented in Table 7.5.2 below.

Table 7.5.2 – Summary of Monitored Groundwater Levels

Location	Water level during monitoring (m bgl)					
	19/02/2019	01/03/2019	06/03/2019	15/03/2019	21/03/2019	29/03/2019
CP01	0.895	0.850	0.860	0.760	0.780	0.850
CP02	0.995	1.290	1.070	1.020	0.790	1.020
CP03	1.010	1.200	1.070	0.710	1.150	1.200

Two monitoring wells (CP01 and CP02) were installed and sealed within the natural ground and one monitoring well (CP03) was installed and sealed within the made ground.

Groundwater monitoring has been carried out on six occasions. It should be noted that the groundwater conditions recorded are based on observations made at the time that site work was carried out (February and March 2019). Groundwater levels are likely to vary owing to seasonal and weather-related effects.

Groundwater elevation (m AOD) and groundwater against depths has been plotted in Figures 7A and 7B in Appendix A.

7.6 Visual and Olfactory Evidence of Hydrocarbon Contamination

Hydrocarbon odours and/or staining were encountered at three exploratory locations, a summary is provided in Table 7.5.1 below.

Table 7.6.1 – Summary of Hydrocarbon Odours encountered During Site Works

Exp. Loc.	Depth (m bgl)	Odour	Material Description
CP01	1.00 to 1.60	Faint hydrocarbon odour	Soft orangish grey slightly sandy slightly silty clay.
TP01	0.45 – 1.50	Faint hydrocarbon odour	Greenish black sandy clay.
TP02	1.60 - 1.80	Strong hydrocarbonodour	Blackish green silty clay.

m bgl – metres below ground level

7.7 Ground Gas

Ground gas monitoring has been undertaken on six occasions. The works were carried out using a portable gas meter in accordance with the standard JPG methodology and included measurements of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and atmospheric pressure.

The results of the gas monitoring are presented in Appendix H and discussed in Section 9 of this report.

7.8 Stability

Based on the ground conditions encountered in the trial pits, the stability of the shallow made ground is considered poor, however the stability of the cohesive reworked natural ground and the natural ground, is considered good in terms of stability.

It is however considered likely that if excavations were left unsupported, then collapse may occur and this is likely to increase in the presence of perched groundwater.

8.0 GEOTECHNICAL AND ENGINEERING ASSESSMENT

8.1 Development Proposals

No development proposals have been provided for the site. However, following discussion with Cloud Wing, the scope of works was based upon B1 (Business), B2 (General Industrial) or B8 (Storage and Distribution) commercial end-uses.

8.2 Foundations & Floors

The ground conditions at the site comprise made ground to a maximum depth of 3.50mbgl, underlain by firm to very stiff fossiliferous laminated clay (Lower Oxford Clay Formation).

Any made ground would be unsuitable for the support of structural loads due to variations in material properties. If shallow spread foundations were to be used within any made ground, the underlying materials would become overstressed, leading to significant settlements. It is therefore recommended that foundation loads are transferred to natural strata of suitable bearing capacity, i.e. the Lower Oxford Clay.

For preliminary design considerations, an allowable bearing capacity of 100kN/m^2 could be assumed for a square pad foundation bearing onto the firm/stiff clay.

The earthworks should be designed in order to provide an acceptable allowable bearing capacity for ground-bearing floor slabs.

Additional ground investigation will be required once a development layout has been confirmed for the site, in order to facilitate more detailed foundation recommendations.

8.3 Earthworks

Any earthworks should be carried out in accordance with the Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks.

8.4 Roads, Pavements and Hardstanding Surfaces

Prior to roads and hardstanding being formed, the formation should be proof rolled and any soft spots removed and replaced with well compacted suitable granular fill. Any substructure remains should be "grubbed out" to a minimum depth of 500mm below the underside of formation to prevent hard spots from forming.

Any earthworks carried out as part of the redevelopment works may result in changes to the subgrade materials. The works should therefore be designed to achieve a suitable CBR value for the proposed development.

The materials with high fines content will deteriorate rapidly due to water ingress and tracking by construction plant. Adequate protection of formation levels will be required to maintain the strength of the material.

8.5 Excavations

Based on the ground conditions encountered in the trial pits, the stability of the shallow made ground is considered poor.

The requirement for temporary support of excavations should be assessed on an individual basis and in any case, excavations of greater than 1.20m depth requiring man entry will require temporary support in accordance with HSE guidance. Alternatively, the sides of the excavation will need to be battered back for the safety of operatives. Guidance on safe batter slopes can be obtained from CIRIA Report 97 Trenching Practice.

Good working practice with respect to drainage of excavations and formations will be required to protect materials. Any excavation for structural foundations must be covered without delay with blinding concrete to prevent softening by water.

8.6 Obstructions

Based on the history of the site and the ground conditions encountered during the site investigation, subsurface obstructions are likely to be present across the site.

It is recommended that an allowance should be made for dealing with these obstructions.

8.7 Chemical Attack on Buried Concrete

Laboratory testing has been undertaken on samples of the made ground and natural ground to determine the sulphate content and acidity and hence the concrete class required for buried concrete.

Laboratory testing in the made ground recorded water-soluble sulphate contents ranging between 120mg/l and 1900mg/l and pH values between 7.7 and 11.6.

In the natural ground, recorded water-soluble sulphate contents ranged between 860mg/l and 2100mg/l and pH values ranged between 7.5 and 7.9.

In the groundwater sample, a water-soluble sulphate content of 690mg/l and a pH value of 6.8 was recorded.

Foundations are likely to come into contact with the underlying natural/made ground and groundwater.

On this basis it is recommended that concrete should be designed to Aggressive Chemical Environment for Concrete (ACEC) Design Sulphate Class DS-3 and ACEC Class AC-3.

This assessment has been made in accordance with BRE Special Digest 1: 2005, entitled 'Concrete in Aggressive Ground'.

9.0 ENVIRONMENTAL RISK ASSESSMENT

9.1 Introduction

Legislation and guidance on the assessment of contaminated sites acknowledges the need for a tiered risk-based approach comprising:

Tier 1 Assessment Comparison of site contaminant concentrations against generic assessment criteria (GAC), i.e. a generic quantitative risk assessment (GQRA). Including an assessment of risk using the source-pathway-receptor model.

Tier 2 Assessment Derivation of site specific risk assessment criteria and calculation of site specific clean up goals, i.e. a detailed quantitative risk assessment (DQRA).

A Tier 1 Assessment has been completed; however, a Tier 2 Assessment has not been undertaken as part of this report.

The statutory definition of contaminated land is given in the Environmental Protection Act, Part IIA, Section 78, 1990, which was introduced by the Environment Act, Section 57, Department of Environment, 1995 and is defined as:

Land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused (where harm is defined as harm to health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property); and/or,
- Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused (by the land).

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists. The potential for harm to occur requires three conditions to be satisfied:

- Sources – The presence of substances (potential contaminants/pollutants), in or under the ground, that may cause harm or pollution;
- Receptors - The presence of a receptor which may be harmed, e.g. the water environment or humans, buildings, fauna and flora; and,
- Pathway - The existence of a linkage between the Source and the Receptor.

In order to assess the contamination risk at the site, the above rationale has been applied and is discussed in the context of Contamination Sources and Potential Pollutant Linkages.

In summary, the presence of measurable concentrations of contaminants within the ground and subsurface environment does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and an unacceptable risk of harm to available receptors.

The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the sensitivity of the intended end use of the site and the sites characteristics and environmental setting.

9.2 Assessment Approach

Human Health
The results of the chemical analysis for each determinand will be assessed against their respective GAC.

These include the LQM/CIEH Suitable 4 Use Levels (S4UL) and Category 4 Screening Levels (C4SL), which were developed using the UK Contaminated Land Exposure Assessment (CLEA) Framework Documents and Software.

The CLEA model uses generic assumptions about the fate and transport of chemicals in the environment and a generic conceptual model (referred to as generic land use scenarios) for site conditions and human behaviour, to estimate child and adult exposures to soil contaminants for those living, working and/or playing on contaminated sites over long-time periods.

The S4UL and C4SL screening levels have been derived for a variety of land uses including residential, allotments, commercial and public open space.

In the absence of S4UL and C4SL for potential contaminants, appropriate alternative GAC will be used.

Controlled Waters
No standards currently exist in the UK which provide threshold values for potential contamination within general groundwater. Alternative guidance is therefore used, against which the significance of potential contaminants can be assessed. For this site, based on the conceptual site model, Drinking Water Standards (DWS) are considered the most appropriate screening values when considering groundwater and leachate results given the overly conservative nature of them.

The results of the leachate analyses will be compared to the same standards as for groundwater.

9.3 Evaluation of Soils Analysis

Initially, the results of the chemical analysis for each potential contaminant will be compared directly with their respective GAC. Based on the current development proposals for the site, i.e. commercial, the results of the chemical analysis for the soil samples have been assessed against GAC for a commercial end-use.

If any significant exceedances of the GAC are noted, then the results will be subject to statistical analysis. An outline of the methodology of the statistical analysis is presented in Appendix F.

Ten samples of made ground and one sample of natural ground were submitted for soil analysis and an asbestos screen; six of these were also submitted for leachability analysis.

Human Health – Made Ground
The results of soil samples obtained from made ground have compared directly with their respective GAC for a commercial end-use. None of the determinands were detected at concentrations in excess of their respective GAC.

Human Health – Natural Ground
The results from the sample obtained from natural ground has been compared directly with their respective GAC for a commercial end-use. None of the determinands were detected at concentrations in excess of their respective GAC.

Asbestos Analysis
Ten soil samples were submitted for an asbestos screen. Chrysotile asbestos fibres were identified in one sample of granular made ground (blackish grey sand and gravel with coal) obtained from TP04 from a depth of between 0.40 – 0.60m bgl. TP04 was located within the central site area.

In order to assess the percentage of asbestos by mass, the sample from TP04 was tested further by asbestos quantification. The asbestos content by mass was recorded as 0.005%. Therefore, the made ground in this location would be deemed potentially harmful to human health as the asbestos concentration is >0.001% mass.

The Control of Asbestos Regulations (CAR 2012) state the following with respect to working with asbestos: 'worker exposure must be below the airborne exposure limit (control limit) of 0.1 fibres per cm^3. A control limit is a maximum concentration of asbestos fibres in the air (averaged over any continuous four-hour period) that must not be exceeded'.

Calorific Value
Calorific value (CV) tests were also carried out on four samples of gravelly made ground, visually identified to have potential coal content. The test results ranged between <0.1MJ/kg and 16.1MJ/kg. Soils with a CV of greater than 10MJ/kg are almost certainly combustible. Soils with values below 2MJ/kg are unlikely to burn. Two of the four samples recorded CVs of greater than 2MJ/kg (5.6MJ/kg and 16.1MJ/kg) and are deemed to be potentially combustible.

9.4 Evaluation of Controlled Waters Analysis

Leachate Analysis

Four samples of made ground and one sample of natural ground was submitted for leachability analysis. The results for each determinand were compared directly against their respective GAC, the results are summarised in Table 9.4.1 below:

Table 9.4.1 – Summary of Leachability Analysis

Determinand	GAC (µg/l)	TP01 0.40 – 0.45	TP02 1.60 – 1.80	TP03 0.70 – 0.90	TP04 0.40 – 0.60	TP09 0.30 – 0.50
pH	6.5 – 9.5	10.2	8.7	8.5	8.4	7.8
Arsenic	50(1)	1.6	0.51	0.66	1.1	0.66
Cadmium	5(1)	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chromium (total)	50(1)	1.7	< 0.25	0.42	0.38	< 0.25
Copper	2000(1)	3.6	1.4	0.9	1.7	1.3
Lead	10(1)	0.22	< 0.09	< 0.09	0.18	< 0.09
Mercury	1(1)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel	20(1)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Selenium	10(1)	1.1	0.56	0.46	0.32	1.2
Zinc	5000(1) *	< 1.3	3	< 1.3	< 1.3	4.1
Cyanide (Free)	50(1)	< 20	< 20	< 20	< 20	< 20
Monohydric phenol	7.7	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	4.24 (2)	< 0.05	0.05	< 0.05	< 0.05	0.12
Anthracene	0.193(2)	< 0.01	0.01	< 0.01	0.13	0.01
Fluoranthene	0.0122(2)	< 0.01	0.03	0.01	0.41	0.02
Sum of: benzo(b)fluoranthene, benzo(k)fluoranthene, indeno (1,2,3-c, d) pyrene benzo (g, h, i) perylene	0.1(1)	All <0.01	0.06	Al <0.01	2.46	0.04
Benzo(a)pyrene	0.01(1)	< 0.01	< 0.01	< 0.01	0.41	< 0.01
Sulphate as SO4	250000(1)	5.6	64	34	29	240

(1) Water Supply (Water Quality) Regulations 2000
*Historical 1989 Threshold Value.
(2) Water Framework Directive 2015, Surface Water, Maximum Threshold Value.

A sample of made ground (TP01) was found to be alkaline, with a pH value of 10.2.

Elevated concentrations of leachable PAH species have been recorded in the sample from TP04 (0.40 – 0.60m bgl). The sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-c,d)pyrene and Benzo(g,h,i)perylene was calculated as 2.46 µg/l, which exceeds the DWS of 0.1 µg/l. An elevated concentration (0.41ug/l) of leachable Benzo(a)pyrene was also recorded within the sample from TP04.

Elevated concentrations of leachable Fluoranthene have been recorded in three samples (TP02 at 1.60mbgl, TP04 at 0.40mbgl and TP09 at 0.30mbgl); with the maximum concentration of 0.41µg/l in TP07. It should be considered that the guideline DWS value of 0.0122µg/l is based upon compliance of potable water supplies.

Groundwater Analysis

One sample of groundwater was obtained from a well-sealed within the natural ground (CP02). The results for each determinand were compared directly with their respective GAC, the results are summarised in Table 9.4.2 below.

Table 9.4.2 – Summary of Groundwater Results

Determinand	GAC (µg/l)	CP02
pH	6.5 – 9.5	6.8
Arsenic	50(1)	0.57
Cadmium	5(1)	<0.03
Chromium (total)	50(1)	<0.25
Copper	2000(1)	1.2
Lead	10(1)	0.11
Mercury	1(1)	<0.01
Nickel	20(1)	6
Selenium	10(1)	0.46
Zinc	5000(1) *	41
Cyanide (Free)	50(1)	<20
Monohydric phenol	7.7	<0.50
Naphthalene	4.24 (2)	1.80
Anthracene	0.193(2)	6
Fluoranthene	0.0122(2)	15
Sum of: benzo(b)fluoranthene, benzo(k)fluoranthene, indeno (1,2,3-c, d) pyrene, benzo (g, h, i) perylene	0.1(1)	45.1
Benzo(a)pyrene	0.01(1)	5.3
Sulphate as SO4	250000(1)	690000

(1) Water Supply (Water Quality) Regulations 2000
*Historical 1989 Threshold Value.
(2) Water Framework Directive 2015, Surface Water, Maximum Threshold Value.

Elevated concentrations of PAHs including Anthracene, Fluoranthene, Benzo(a)pyrene and sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-c,d)pyrene and Benzo(g,h,i)perylene been recorded within the groundwater sample from CP02, all of which exceed their respective DWS values. The sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-c,d)pyrene and Benzo(g,h,i)perylene was calculated as 45.1 µg/l, which exceeds the DWS of 0.1 µg/l.

Elevated sulphate (as SO4) was recorded at 690,000 ug/l which exceeds the DWS of 250,000 µg/l.

The groundwater sample obtained from CP02 was also submitted for analysis of TPHCWG, PCBs, VOCs, SVOCs and Mecoprop; all of which returned below the laboratory limit of detection.

9.5 Evaluation of Hazardous Ground Gases

Based on the desk study information and ground conditions encountered, it is considered that there is the potential for the presence of hazardous gases on the site.

9.6 Ground Gas Monitoring

In order to assess the potential risks posed to the proposed development from hazardous gases, monitoring wells were installed in all three boreholes (CP01, CP02 and CP03).

The monitoring wells in CP01 and CP02 were sealed within the natural ground and the monitoring well in CP03 was sealed within the made ground.

Ground gas monitoring has been undertaken on six occasions. The works were carried out using a portable infrared gas meter and included the measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and atmospheric pressure.

9.7 Summary of Results

In order to assess the potential risks posed to the proposed development from hazardous gases, monitoring wells were installed in all three cable percussive boreholes, with response zones within the made ground and natural ground.

Ground gas monitoring has been undertaken on six occasions. The works were carried out using a portable infra-red gas meter and included the measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and atmospheric pressure.

Summary of Results
The results of the gas monitoring are presented on the site visit record sheets in Appendix G and are summarised and commented on below:

- No concentrations of methane were detected in any of the three installations.
- Carbon dioxide has been recorded in all monitoring wells. Maximum steady concentrations ranged between 0.1% v/v and 6.5% v/v. Steady concentrations of carbon dioxide in excess of 5% v/v were recorded within CP03 only, during visits 2, 3, 4, 5 and 6. No other concentrations of carbon dioxide in excess of 5% v/v were recorded.
- Reduced oxygen concentrations (i.e. <16% v/v) were recorded during visits 1, 2, 5 and 6 within CP03 only. The reduced concentrations within CP03 ranged from 11.6% v/v to 15.0% v/v.
- A maximum steady and peak flow of 8.9 l/hr was recorded in CP02 during visit 2.

Three of the monitoring visits (2, 3 and 4) were carried out during periods of falling atmospheric pressure, one visit during rising pressure (1) and two visits during steady pressure (5 and 6). Barometric pressures during the monitoring period ranged between 985mB and 1031mB.

The borehole installation within CP03 contained a response zone targeting granular made ground, comprising a gravelly brick/ ash fill with frequent coal. The made ground within CP03 had a high organic matter content of 12% and a calorific value of 16.1MJ/kg, both factors potentially contributing to the elevated carbon dioxide readings.

9.8 Requirements for Gas Protection Measures

The results of the gas monitoring have been assessed in accordance with CIRIA Report C665 'Assessing risks posed by hazardous ground gases to buildings' and BS8485:2015, 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

A maximum steady flow of 8.9 l/hr was recorded in CP03 during visit 2.

A maximum steady concentration of 6.5% v/v carbon dioxide was recorded in CP03, with concentrations of >5% v/v recorded on visits 2, 3, 4, 5 and 6. CP03 recorded carbon dioxide in excess of 5% v/v during all six monitoring visits. No other boreholes recorded carbon dioxide in excess of 5%.

None of the monitoring locations detected methane.

Therefore, in calculating the Characteristic Situation (CS) Gas Screening Value (GSV) for the site, a maximum recorded steady flow rate of 8.9 l/hr has been adopted. Combined with a maximum steady carbon dioxide reading of 6.5% v/v results in a GSV for carbon dioxide of 0.58 l/hr.

As the GSV for carbon dioxide is between 0.07 l/hr and 0.7 l/hr, and steady concentrations of carbon dioxide >5% v/v have been recorded, Characteristic Situation 2 (low risk) is considered applicable for the site in accordance with BS8485:2015. On this basis, gas protection measures will be required in new buildings.

9.9 Radon Risks

The site is not in a radon affected area, as less than 1% of properties are above the action level for radon gas. Therefore, no radon gas protective measures will be required.

9.10 Summary of Sources, Pathways and Receptors

Sources
Based on the results of the analysis carried out, the following potential sources of contamination are considered to be present on the site:

- Potentially airborne asbestos fibres (chrysotile - 0.005%) within the shallow made ground.
- Hazardous ground-gas e.g. carbon dioxide.
- Elevated concentrations of heavy metals, PAHs and sulphates within the groundwater, including potential for groundwater vapours.

- Potentially aggressive ground e.g. sulphate content and acidity; and,
- Potentially combustible made ground.

Pathways
Based on the available information and the proposed redevelopment of the site for a commercial end use, the following potential exposure pathways will require consideration, both during the redevelopment works and in relation to the end use scenario:

- Ingestion and dermal contact with contaminated soils/groundwater.
- Inhalation of hazardous gases/asbestos fibres/vapours.
- Migration of hazardous gases e.g. into buildings via service ducts.
- Migration of contaminated groundwater e.g. through flow and/or surface flow.
- Potential for combustion of made ground, as a result of bonfires or other heat/ignition sources.
- Permeation of water supply pipes, structures and other services by organic and aggressive contaminants.
- Plant uptake.

Receptors
The potential receptors considered are:

- Construction workers and future maintenance workers involved in excavations, e.g. foundations or where services are being installed.
- Future site end-users e.g. employees and visitors.
- Controlled Waters.
- Plants/ soft landscaping; and,
- Buildings and Services.

9.11 Source – Pathway – Receptor Linkages

Based on the above sources, pathways and receptors, the following linkage assessments have been considered. A conceptual site model illustrating the active pollutant linkages at the site is presented as Figure 8 in Appendix A and discussed below.

This assessment is based on current site conditions (unless stated) and does not consider exposure pathways following any remediation of the site.

Construction and Maintenance Workers
Based on the sources of potential contamination which have been identified on the site, there is a risk to development and maintenance workers involved in groundworks at the site. There is the potential for exposure to the following:

- Potentially airborne asbestos fibres (chrysotile - 0.005%) within the shallow made ground.
- Hazardous ground-gas e.g. carbon dioxide.
- Elevated concentrations of heavy metals, PAHs and sulphates within the groundwater, including potential for groundwater vapours.

Future Site End Users
It is unlikely that future site end users will come into contact with the site in its current condition. However, based on the site in its current condition, there is a risk to future site end-users. There is the potential for exposure to the following:

- Potentially airborne asbestos fibres (chrysotile - 0.005%) within the shallow made ground.
- Hazardous ground-gas e.g. carbon dioxide.
- Elevated concentrations of heavy metals, PAHs and sulphates within the groundwater, including potential for groundwater vapours.
- Potentially combustible made ground.

Buildings and Services
Based on the encountered ground conditions, there is the potential for buildings and services to be exposed to the following:

- Potentially aggressive ground e.g. sulphate content and acidity.
- Elevated concentrations of sulphates within the groundwater.

Controlled Waters
Based on the encountered elevated concentrations of heavy metals, PAHs and sulphates within the groundwater, there is a potential for nearby surface waters to be impacted.

An assessment of risk to controlled waters (notably Elstow Brook) should consider the environmental setting of the site, which is summarised below:

- The shallow ground comprises granular made ground over soft to firm reworked cohesive deposits. The cohesive deposits should limit the migration of potential contaminants to adjacent watercourses.
- The nearest surface water feature (Elstow Brook) is culverted beneath the site, and located to the immediate north of the site, parallel to the northern boundary and flowing from west to east.
- There are three active licensed discharge consents to surface water within 500m of the site, all pertaining to Elstow Brook (or a tributary thereof).

- There are no licensed surface water abstractions within 1km of the site.
- The Lower Oxford Clay is recorded as unproductive strata.
- The site does not lie within 500m of an Environment Agency Groundwater Source Protection Zone.

Based on the above factors, i.e. the presence of cohesive deposits which will act as a barrier to limit the migration of potential contaminants and absence of significant nearby receptors, it is concluded that there are no plausible linkages to controlled water receptors. Therefore, the risk to controlled waters is considered to be very low.

9.12 Mitigation Measures

In order to mitigate the risks posed by the potential contaminants which have been identified on the site, consideration should be given to the following mitigation measures.

Human Health - Construction and Maintenance Workers
In order to mitigate the risks posed by the potential contamination present on the site, consideration should be given to the following mitigation measures:

- Site workers involved in groundworks should take the necessary measures to ensure that all works in excavations and confined spaces are carried out in accordance with best practice in order to prevent exposure to potentially hazardous gases and vapours.
- Site workers involved in groundworks should use appropriate PPE, i.e. overalls and gloves and where appropriate facemasks. Appropriate health and safety measures, e.g. washing hands prior to eating or drinking, should also be enforced.

The testing undertaken indicates the presence of asbestos in the form of chrysotile bundles within the shallow made ground encountered in the centre of the site. Made ground of varying composition was encountered across the whole site. It is recommended that the following measures are adopted:

- In order to protect against the inhalation of asbestos fibres during the construction and maintenance periods the contractor should provide a soils risk assessment and that employees should also receive asbestos awareness training in order to avoid exposure.
- In order to inform the soils risk assessment, air monitoring for asbestos fibres may be required.
- Any monitoring and analysis of asbestos in air should be carried out in accordance with the Control of Asbestos Regulations (CAR) 2012 and by a suitably accredited organisation (ISO/IEC 17025:2005).
- If air monitoring is to be carried out as the main source of air concentration data for exposure estimation, then some monitoring should be carried out during periods of dry weather, i.e. when dust is being generated.

- The risk assessment and recommendations for mitigation will need to be completed by a suitably qualified specialist.

During development of the site, all workers should remain vigilant to the possible risk of encountering areas of potentially contaminated material. Should potentially contaminated material be encountered, site management should be informed. Further testing may then be required to assess the risk to health and safety of the site workers and the environment.

All employers involved in works at the site should produce an appropriate method statement and risk assessment, to which all employees should comply. Reference should also be made to appropriate HSE and other guidance for working on contaminated and potentially contaminated sites.

Future Site Users
It is likely that a commercial development will include areas of hardstanding and soft landscaping.

It is recommended that a sufficient thickness of clean cover is placed within soft landscaped areas, in order to isolate potential contaminants, i.e. asbestos fibres, in the underlying made ground. The provision of a suitable growing medium may also be required in order to promote plant growth within areas of landscaping.

The results of the gas monitoring have been assessed in accordance with BS8485:2015, 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.'

Gas Characteristic Situation 2 has been determined for the site, based on the readings obtained during six visits within three monitoring wells. Mitigation measures will be required in order to prevent the ingress of hazardous ground gases into buildings. This is likely to include a gas resistant membrane.

It is recommended that additional ground gas monitoring is undertaken prior to development in order to confirm the ground gas regime.

No shallow made ground soils with elevated calorific value (>2MJ/kg) should remain within 1m of finished ground level in any soft landscaped area. Confirmatory testing may be required as part of any earthworks in order to confirm that the soils retained within 1m of the finished surface are not potentially combustible.

A Remedial Strategy Report is likely to be required for the site.

Buildings and Services
It is recommended that concrete should be designed to Aggressive Chemical Environment for Concrete (ACEC) Design Sulphate Class DS-3 and ACEC Class AC-3, in accordance with BRE Special Digest 1: 2005, entitled 'Concrete in Aggressive Ground'.

Planting in Landscape Areas
It is recommended that a sufficient thickness of a suitable growing medium may also be required in order to promote plant growth within areas of landscaping.

9.13 Classification of Materials for Disposal Offsite

Nine samples of made ground and two samples of natural ground were assessed using HazWasteOnline^{tm} in order to determine the classification of the materials for disposal offsite.

Based on the results of the chemical analysis, nine of the samples can be classified as non-hazardous. However, two samples (TP01 and TP06) have been classed as hazardous or potentially hazardous, due to pH levels (11.6 in TP01 and 11.8 in TP06). Details of the classification generated by HazWasteOnline^{tm}, is presented in Appendix F.

The results of the chemical analysis and the HazWasteOnline^{tm} waste classification should be forwarded to the landfill operator to confirm this assessment and provide a price for disposal.

M. Peckham
BSc FGS
For and on behalf of JPG (Leeds) Limited

April 2019

Appendix A Figures/Drawings

Figure 1 – Site Location Plan	
Site	**Former Shanks Railway Sidings, Stewartby, Bedford**
Client	**Cloud Wing (UK) Limited** **Renewi PLC**
Job Number	**5112**
Scale	**NTS**

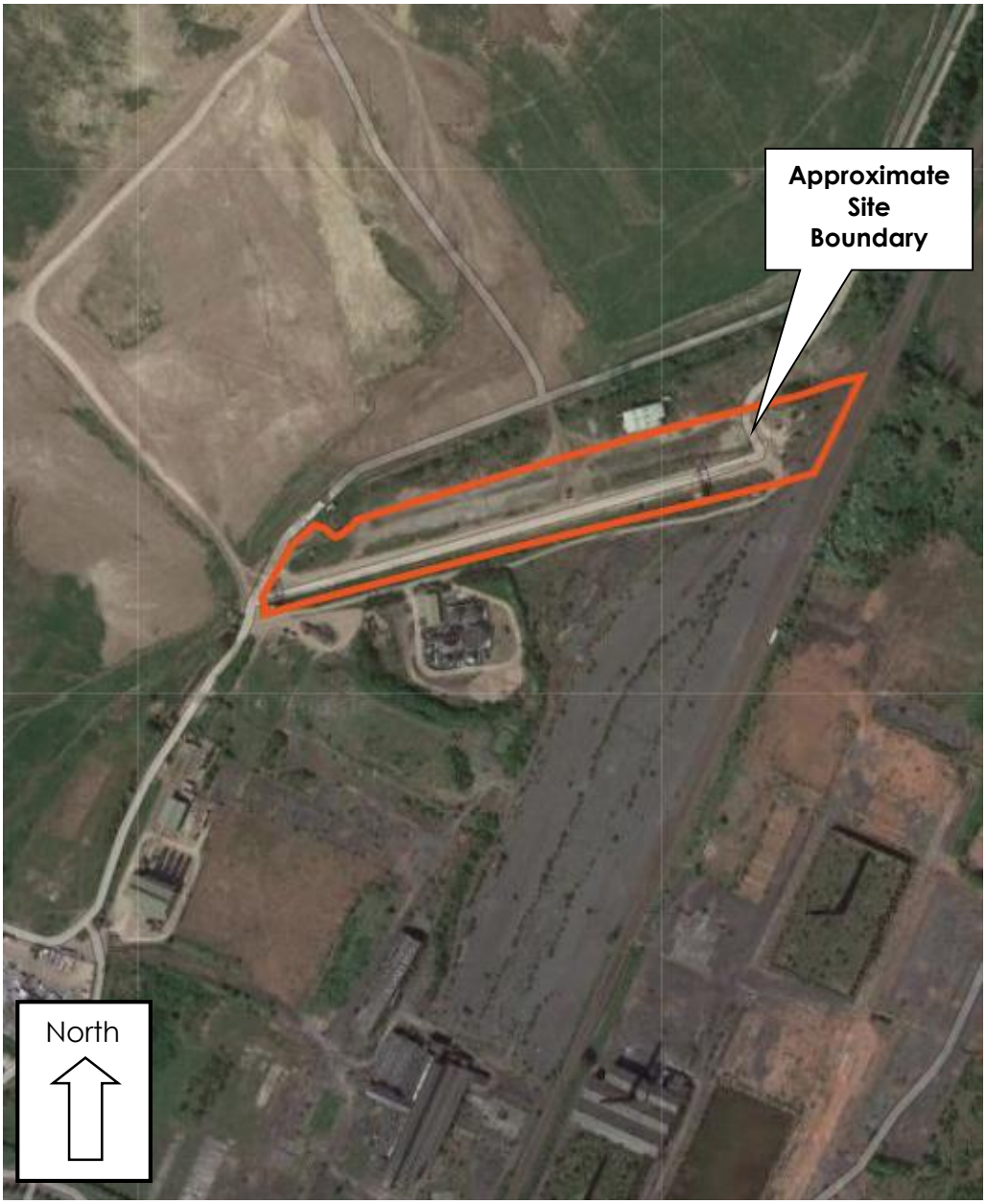


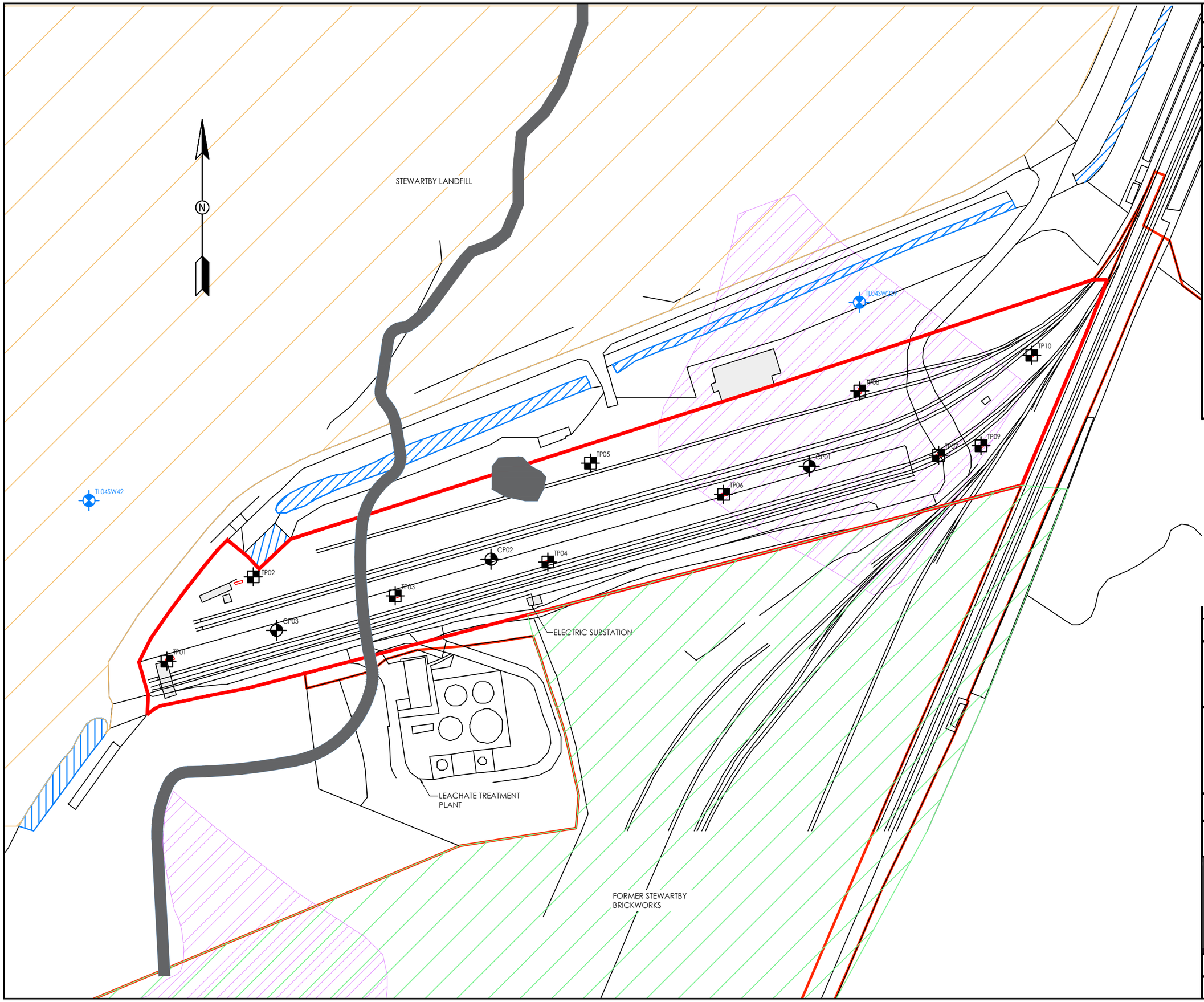
Figure 2 – Aerial Photograph	
Site	**Former Shanks Railway Sidings, Stewartby, Bedford**
Client	**Cloud Wing (UK) Limited** **Renewi PLC**
Job Number	**5112**
Scale	**NTS**

DO NOT SCALE

NOTES

SITE INVESTIGATION KEY

- CP01 — BOREHOLES CARRIED OUT BY JPG IN 2019
- TP01 — TRIAL PITS CARRIED OUT BY JPG IN 2019
- TL04SW42 — BSG BOREHOLES
- SURFACE WATER
- APPROXIMATE SITE BOUNDARY
- HISTORIC CLAY EXTRACTION
- HISTORIC POND/WATER COURSE



REV	DESCRIPTION	DATE	BY

Project
SHANKS LAND,
BRICKWORKS,
BEDFORD

Drawing Title
EXPLORATORY HOLE LOCATION PLAN

INFORMATION ISSUE

Architect

JPG
www.jpg.group
Leeds London Birmingham 0113 263 1155

JPG Project Ref	Scale at A3	Date	Checked	Drawn
5112	NTS	FEB '19	MHP	SH

5112 - JPG - XX - 00 - DR - G - 1300 | S2 | P01

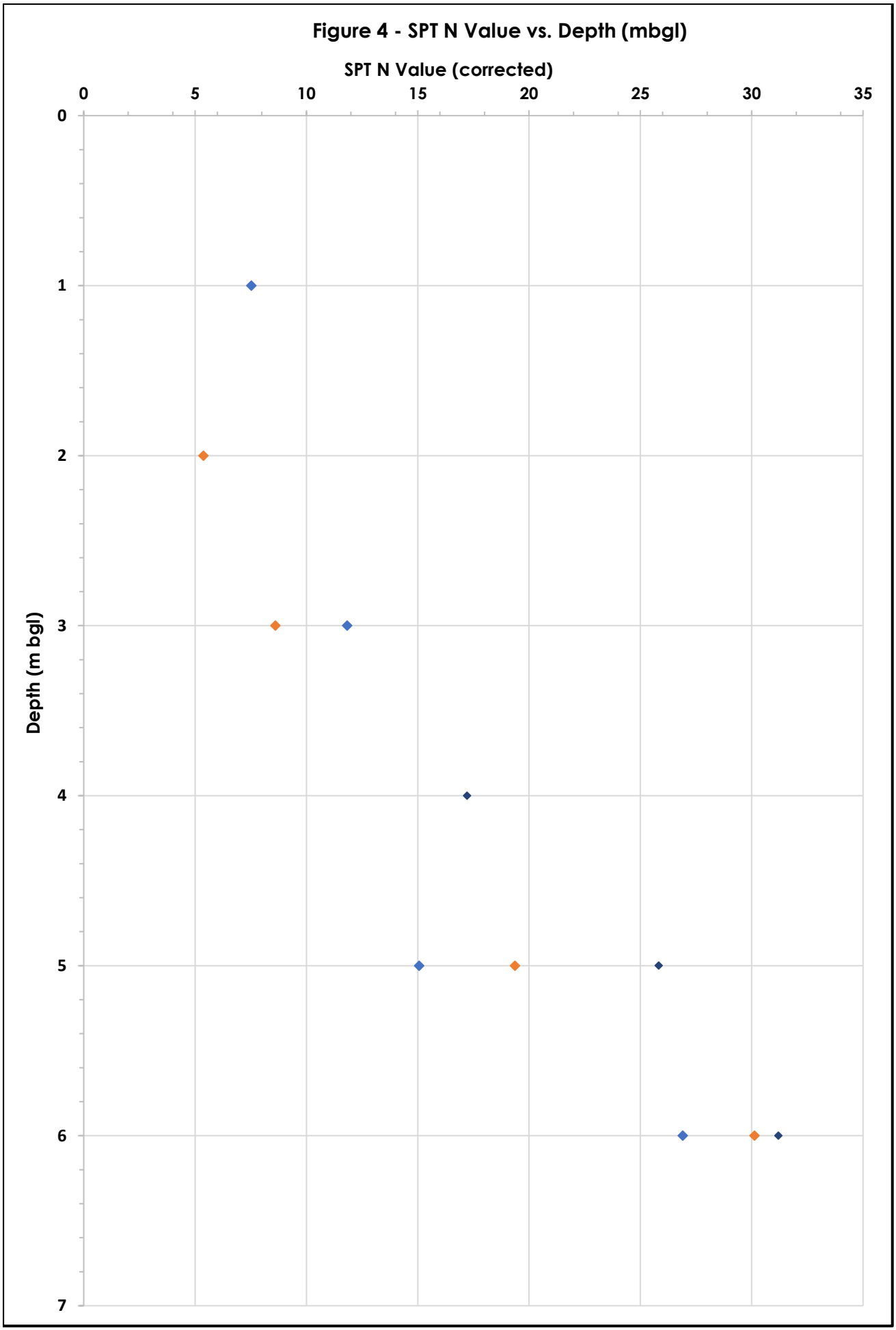


Figure 4 - SPT N Value vs. Depth (mbgl)
SPT N Value (corrected)
0
5
10
15
20
25
30
35
Depth (m bgl)
0
1
2
3
4
5
6
7

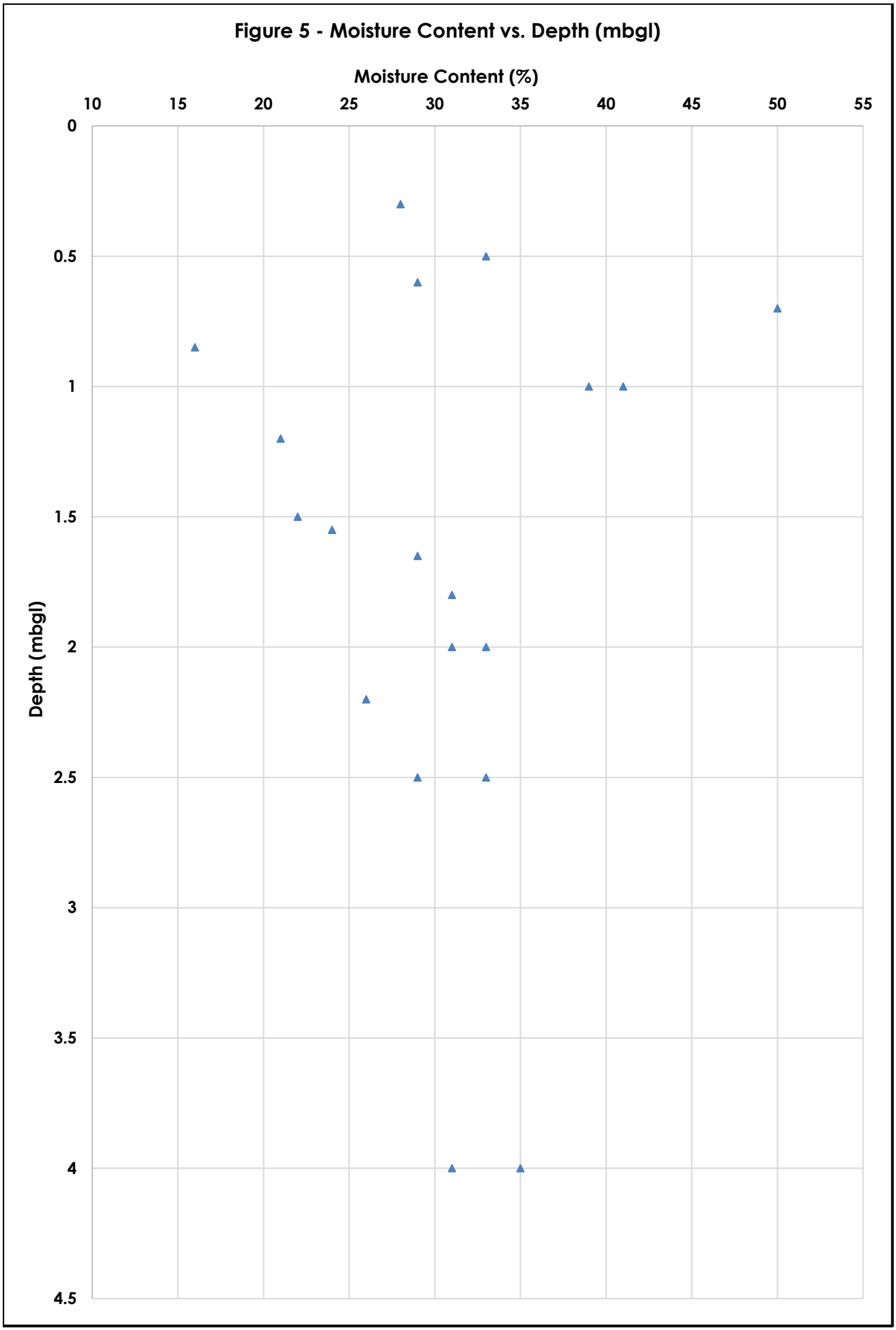


Figure 5 - Moisture Content vs. Depth (mbgl)
Moisture Content (%)
10
15
20
25
30
35
40
45
50
55
Depth (mbgl)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

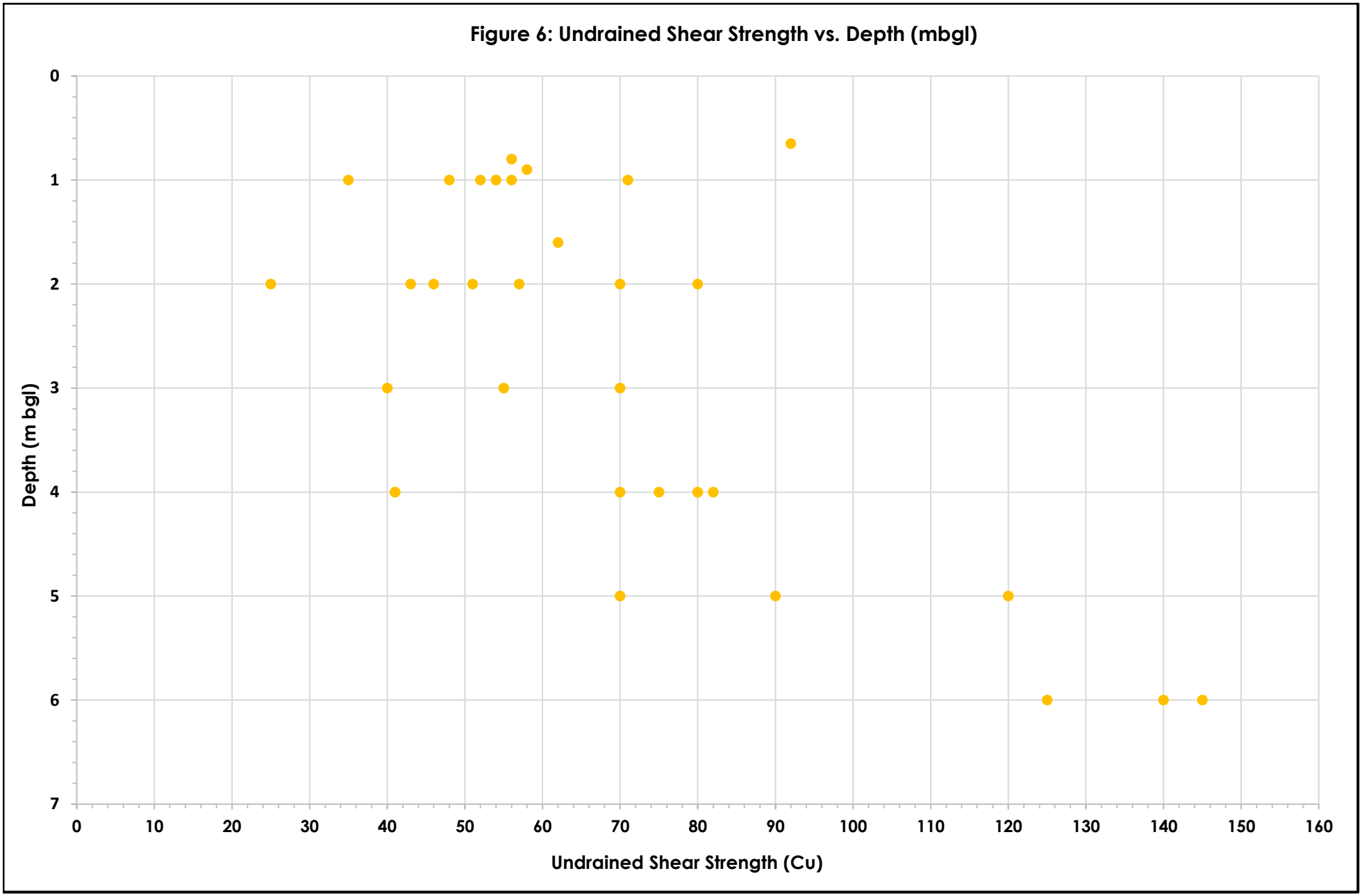


Figure 6: Undrained Shear Strength vs. Depth (mbgl)
Depth (m bgl)
0
1
2
3
4
5
6
7
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
Undrained Shear Strength (Cu)

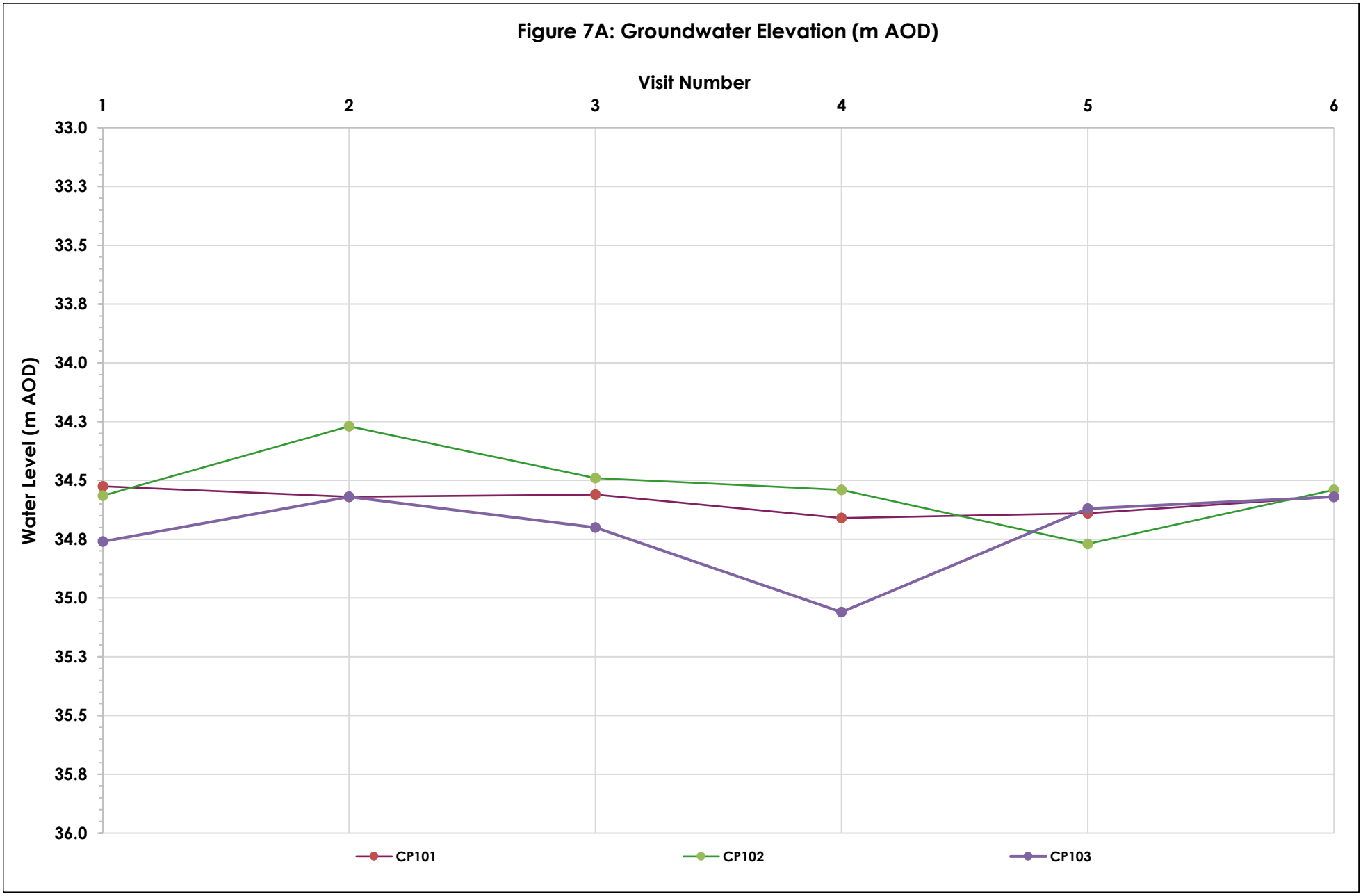


Figure 7A: Groundwater Elevation (m AOD)
Visit Number
1
2
3
4
5
6
Water Level (m AOD)
33.0
33.3
33.5
33.8
34.0
34.3
34.5
34.8
35.0
35.3
35.5
35.8
36.0
CP101
CP102
CP103

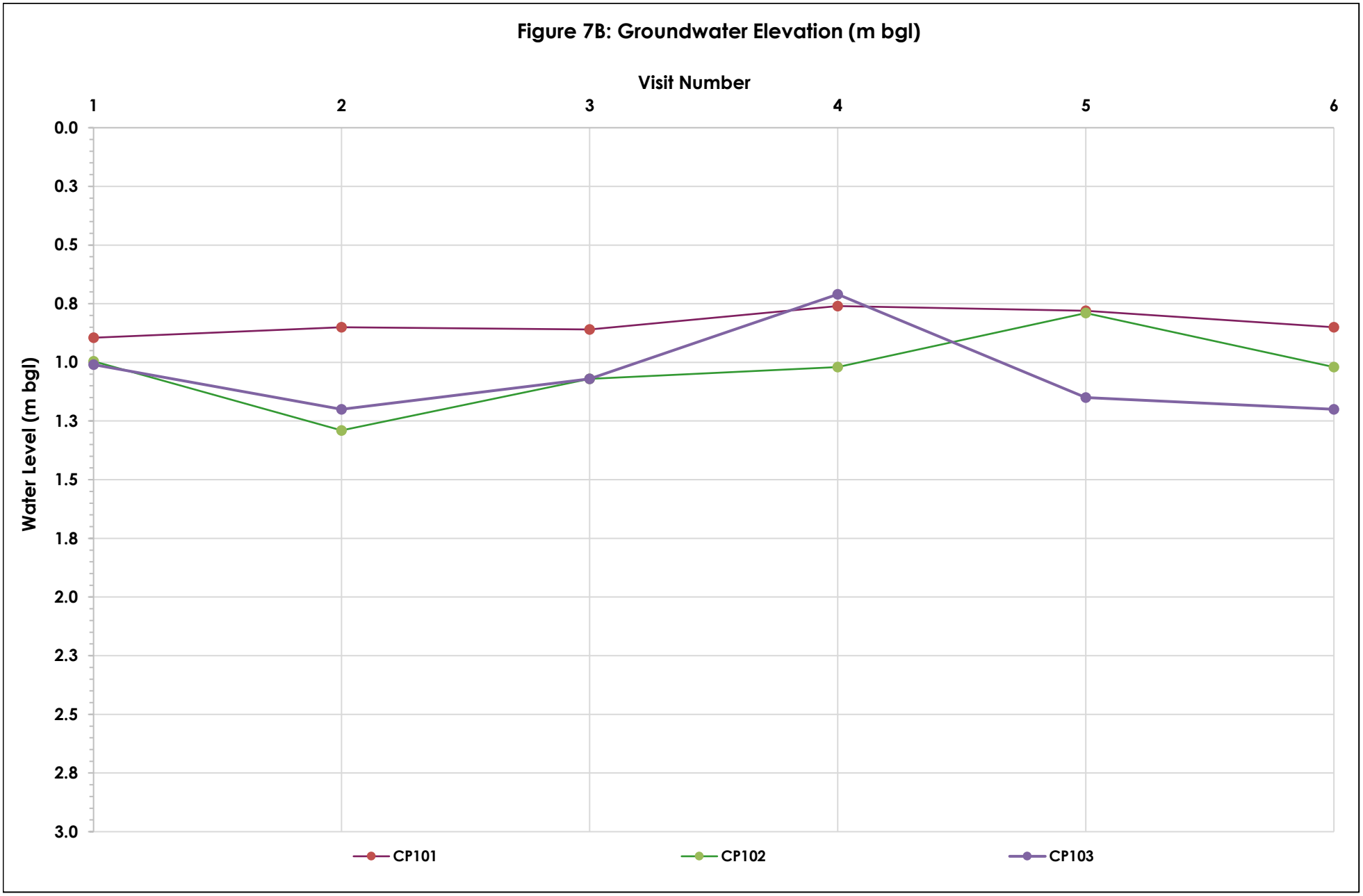


Figure 7B: Groundwater Elevation (m bgl)
Visit Number
1
2
3
4
5
6
Water Level (m bgl)
0.0
0.3
0.5
0.8
1.0
1.3
1.5
1.8
2.0
2.3
2.5
2.8
3.0
CP101
CP102
CP103

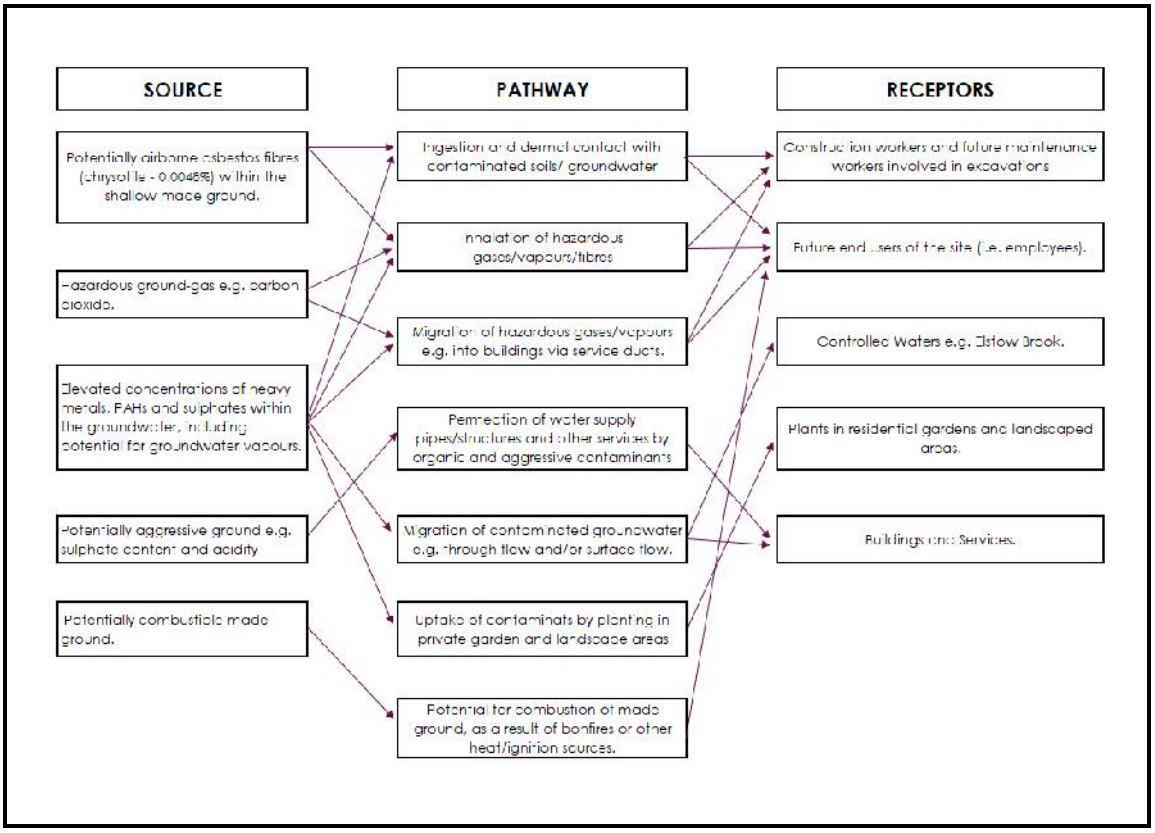


Figure 8 – Conceptual Site Model	
Site	**Former Shanks Railway Sidings, Stewartby, Bedford**
Client	**Cloud Wing (UK) Limited** **Renewi PLC**
Job Number	**5112**
Scale	**NTS**

Appendix B Site Photographs

Photograph 1: View looking west towards Stewartby landfill and site entrance.

Photograph 2: View looking south-east towards former Stewartby brickworks and railway.

Photograph 3: View from the centre of the site looking west towards Stewartby landfill.

Photograph 4: View looking east, towards the railway.

Photograph 5: View looking north-east from the eastern site area.

Photograph 6: Eastern site area.

Photograph 7: Former Weighbridge to the western site area.

Photograph 8: Possible asbestos cement sheeting roof located within the western site area.

Photograph 9: Example of overgrown railway sidings, looking east

Photograph 10: Eastern site area looking off-site, towards the Mid Valley Railway.

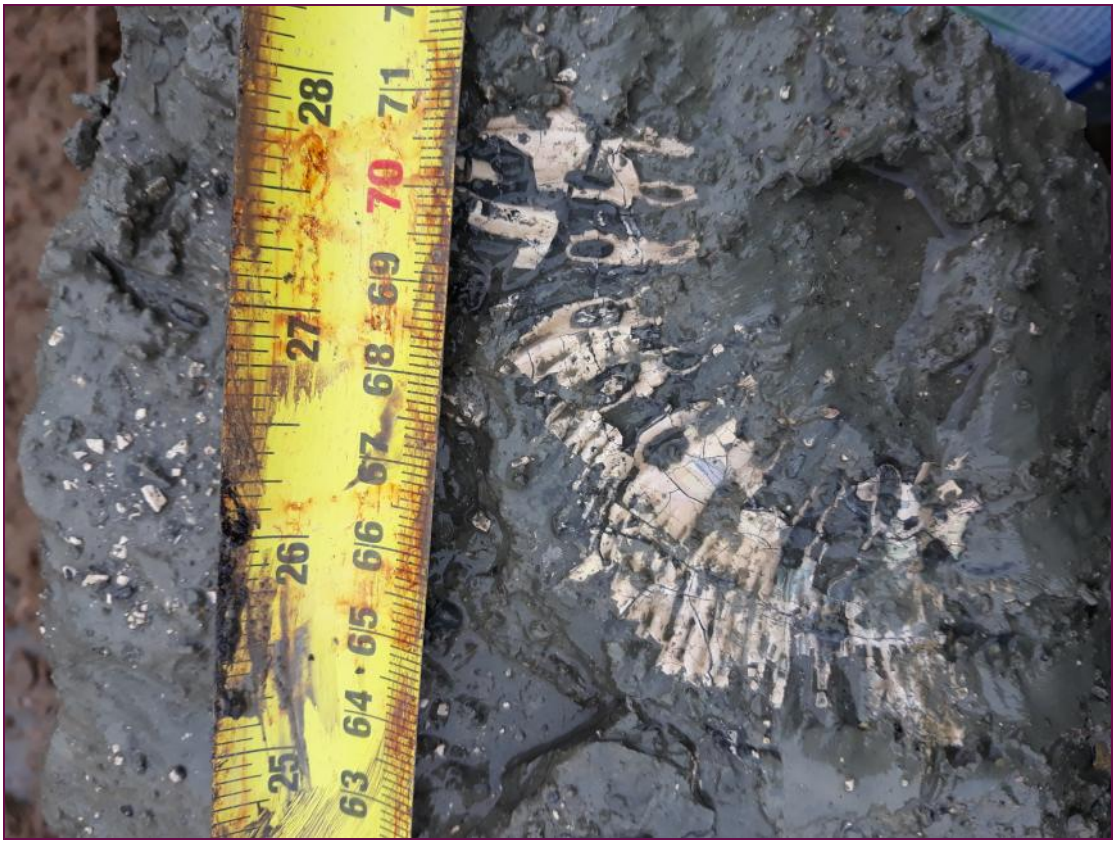
Photograph 11: Excavated TP02.

Photograph 12: Excavated TP01.

Photograph 13: Excavated TP05.

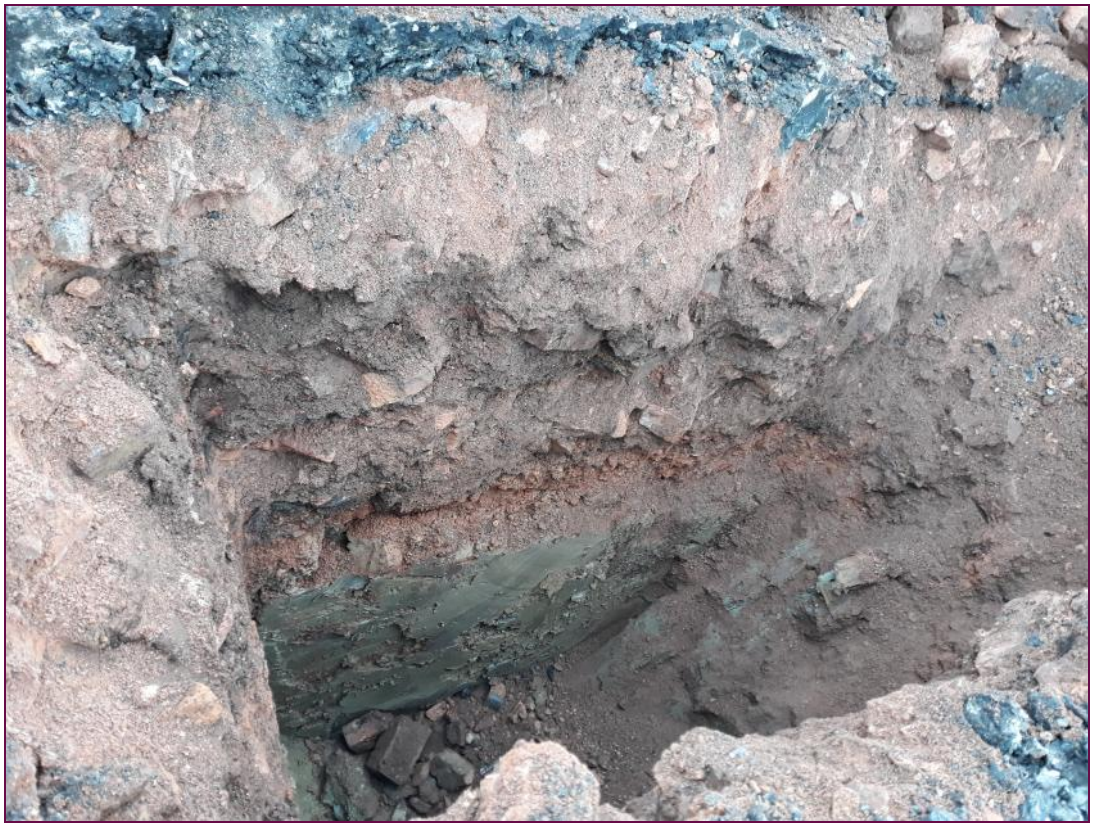
Photograph 14: Excavated TP03.

Photograph 15: Excavated TP06.



Photograph 16: Sample from TP06.

Photograph 17: Excavated TP07.



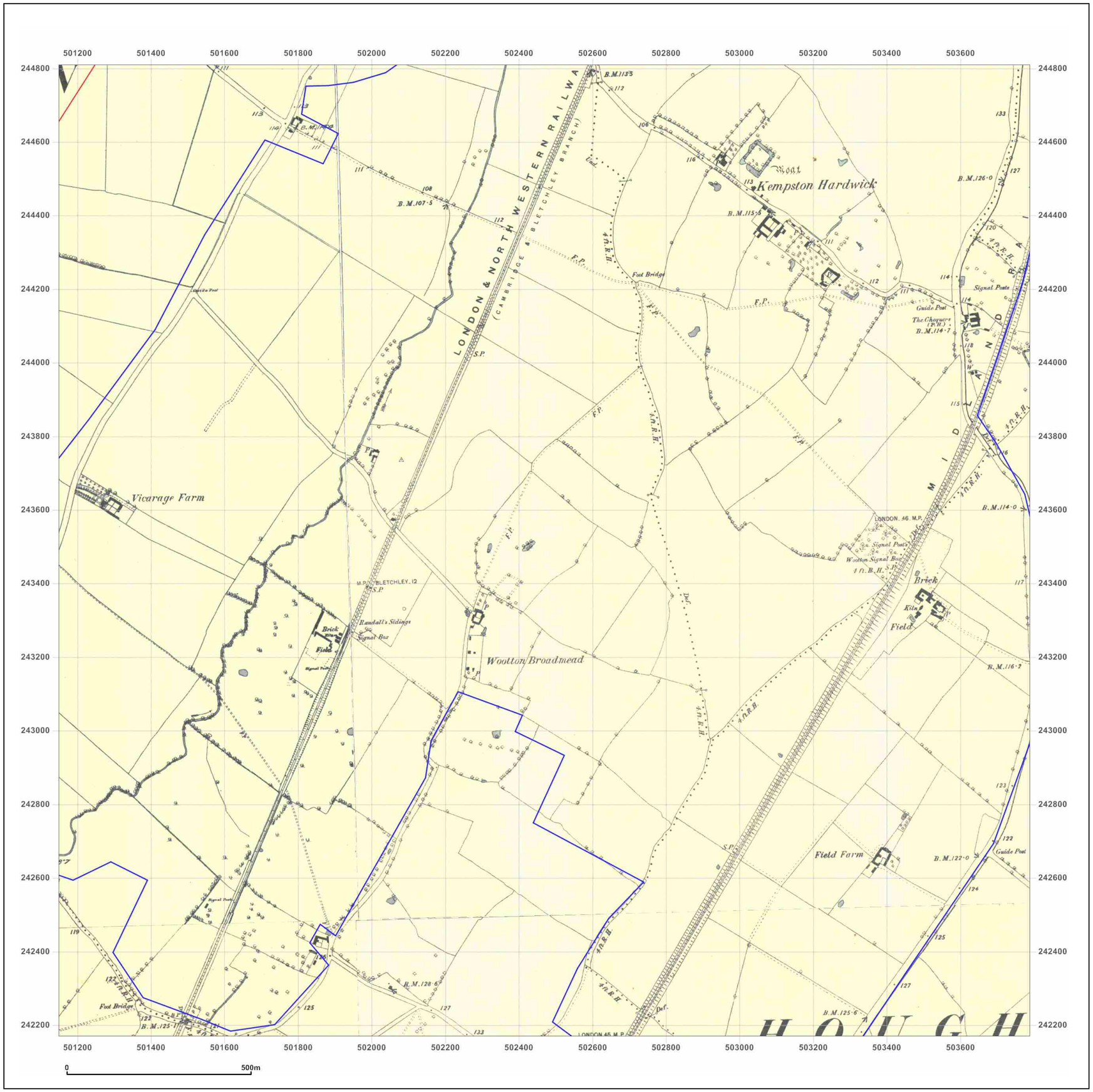
Photograph 18: Excavated TP09

Photograph 19: Excavated TP10.

Photograph 20: Excavated TP08.

Photograph 11: Sample from TP06.

Appendix C Historical Plans



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: County Series

Map date: **1882**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1882
Revised 1882
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1882
Revised 1882
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1882
Revised 1882
Edition N/A
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Levelled N/A

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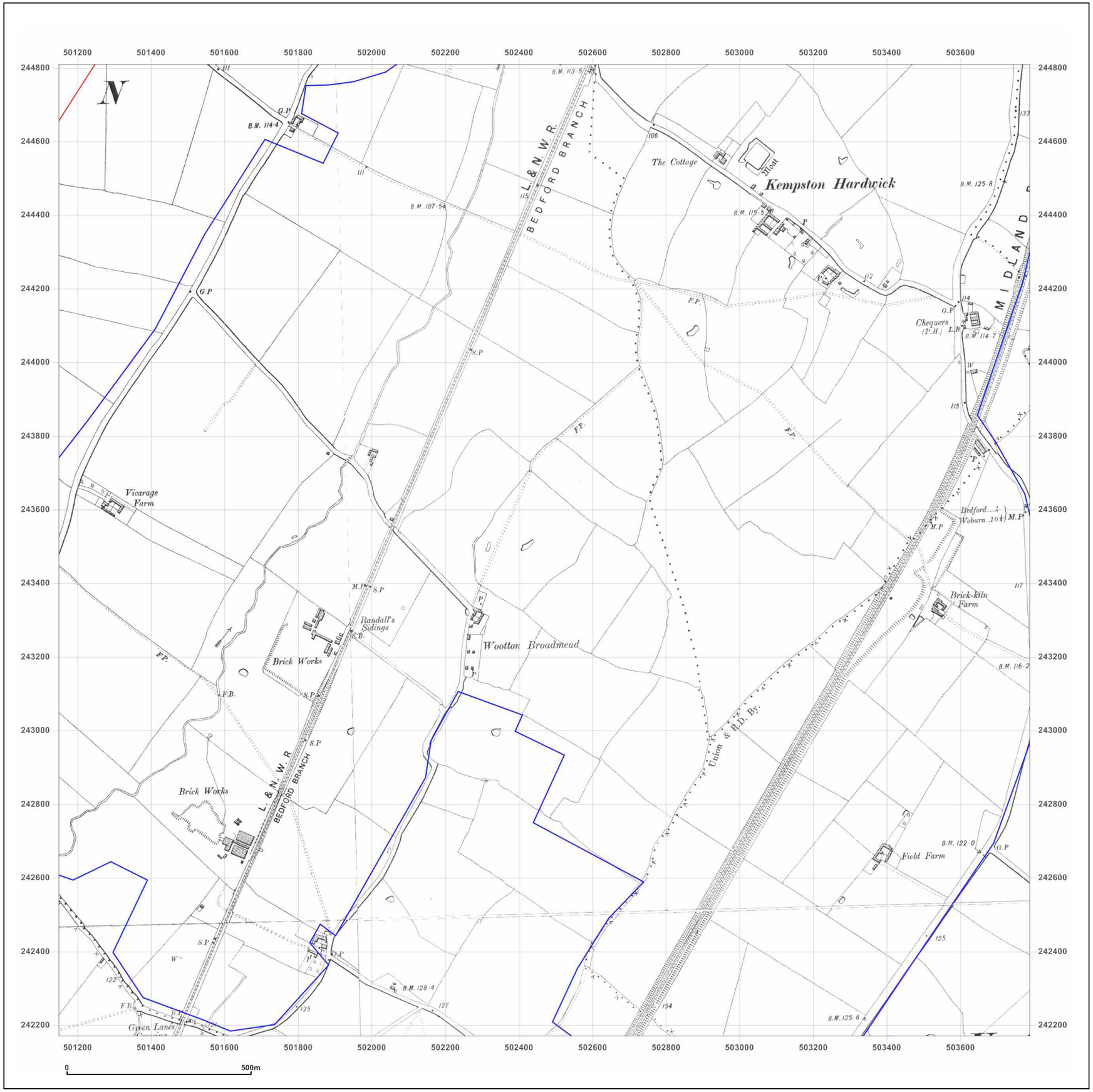

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FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: County Series

Map date: **1900**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1900
Edition N/A
Copyright N/A
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Surveyed 1881
Revised 1900
Edition N/A
Copyright N/A
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Surveyed 1881
Revised 1900
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Revised 1900
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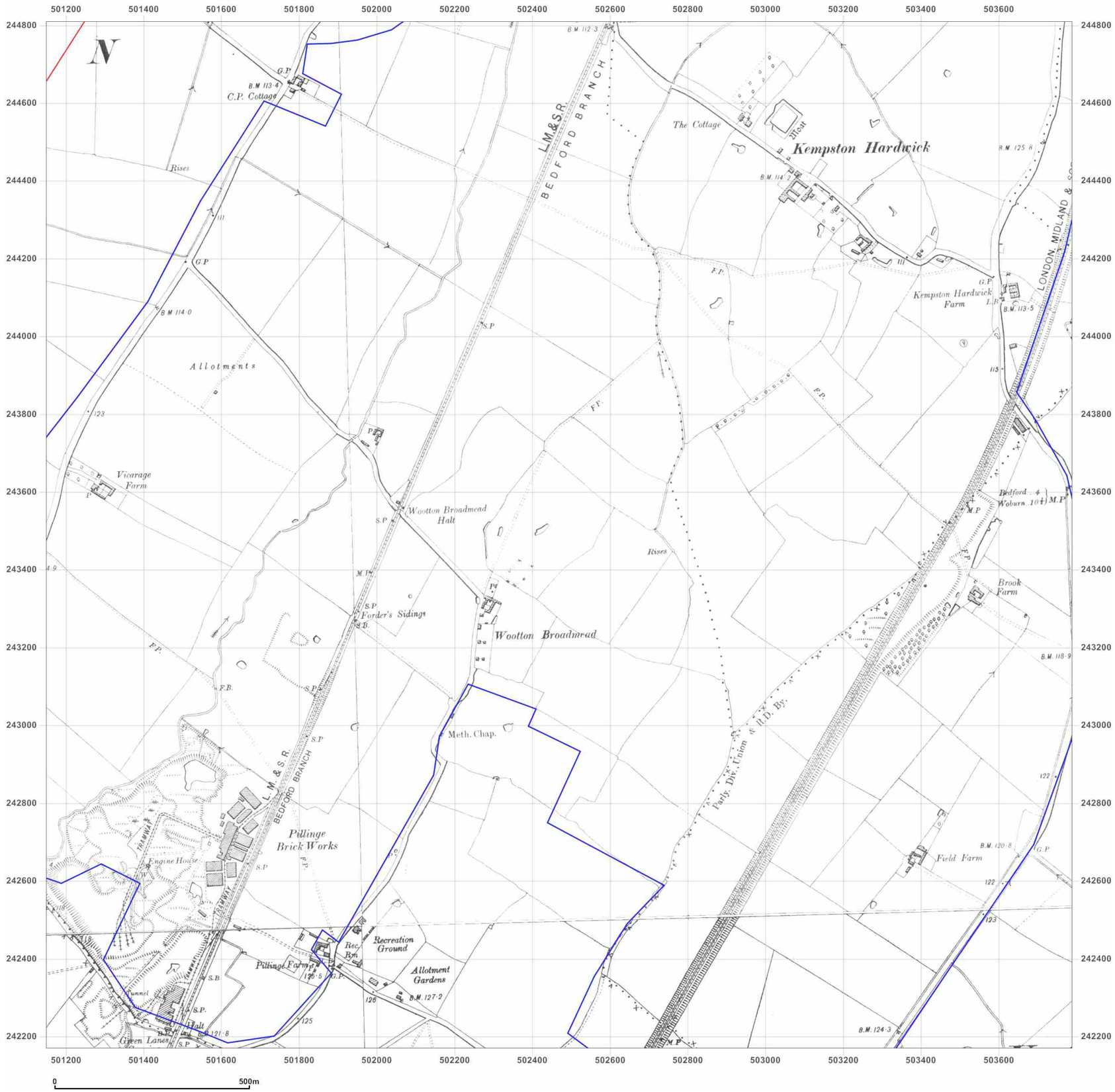

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: County Series

Map date: **1924**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1881
Revised 1924
Edition N/A
Copyright N/A
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Surveyed 1881
Revised 1924
Edition N/A
Copyright N/A
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Surveyed 1881
Revised 1924
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Revised 1924
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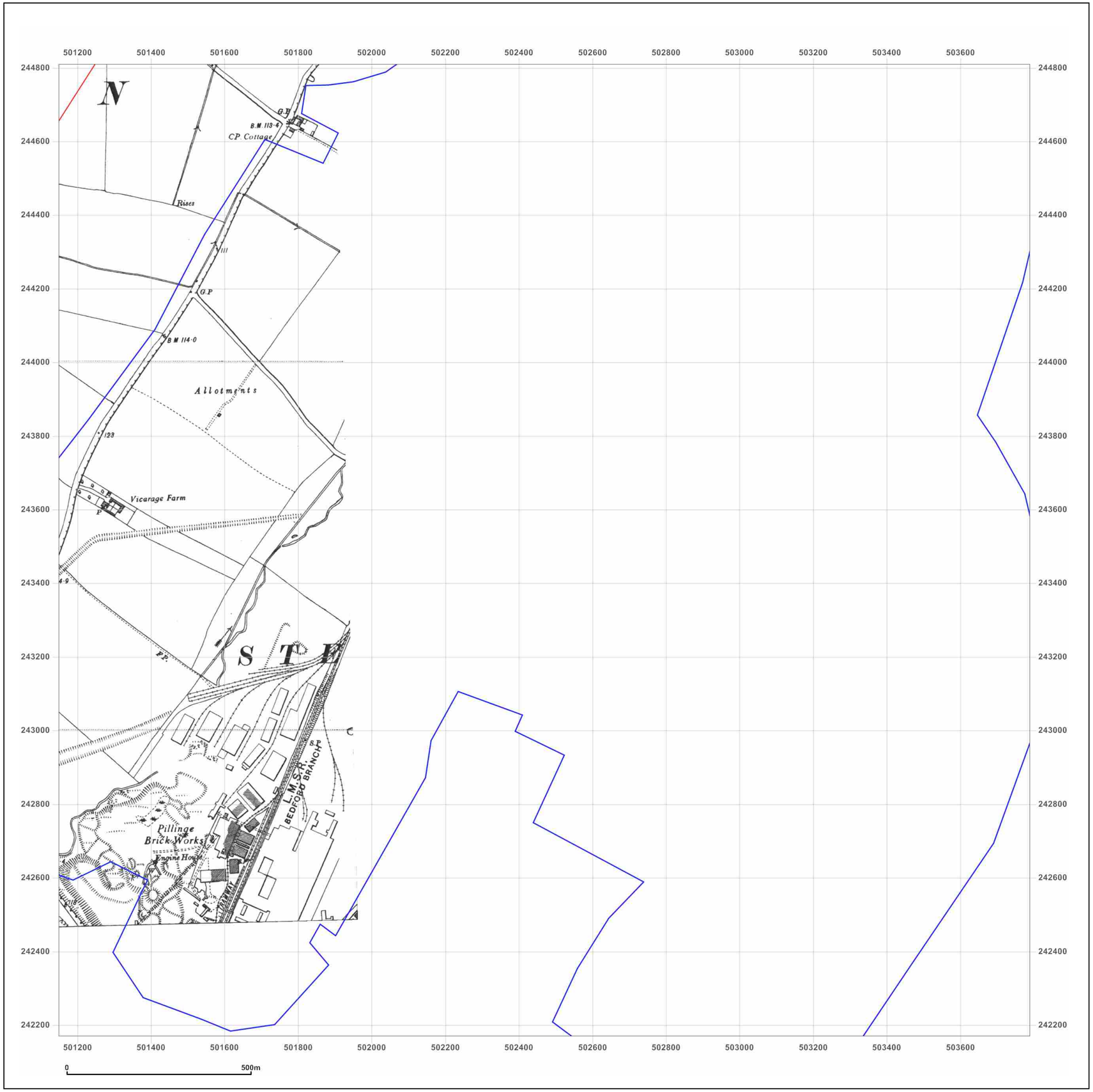

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: County Series

Map date: **1924**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1924
Edition N/A
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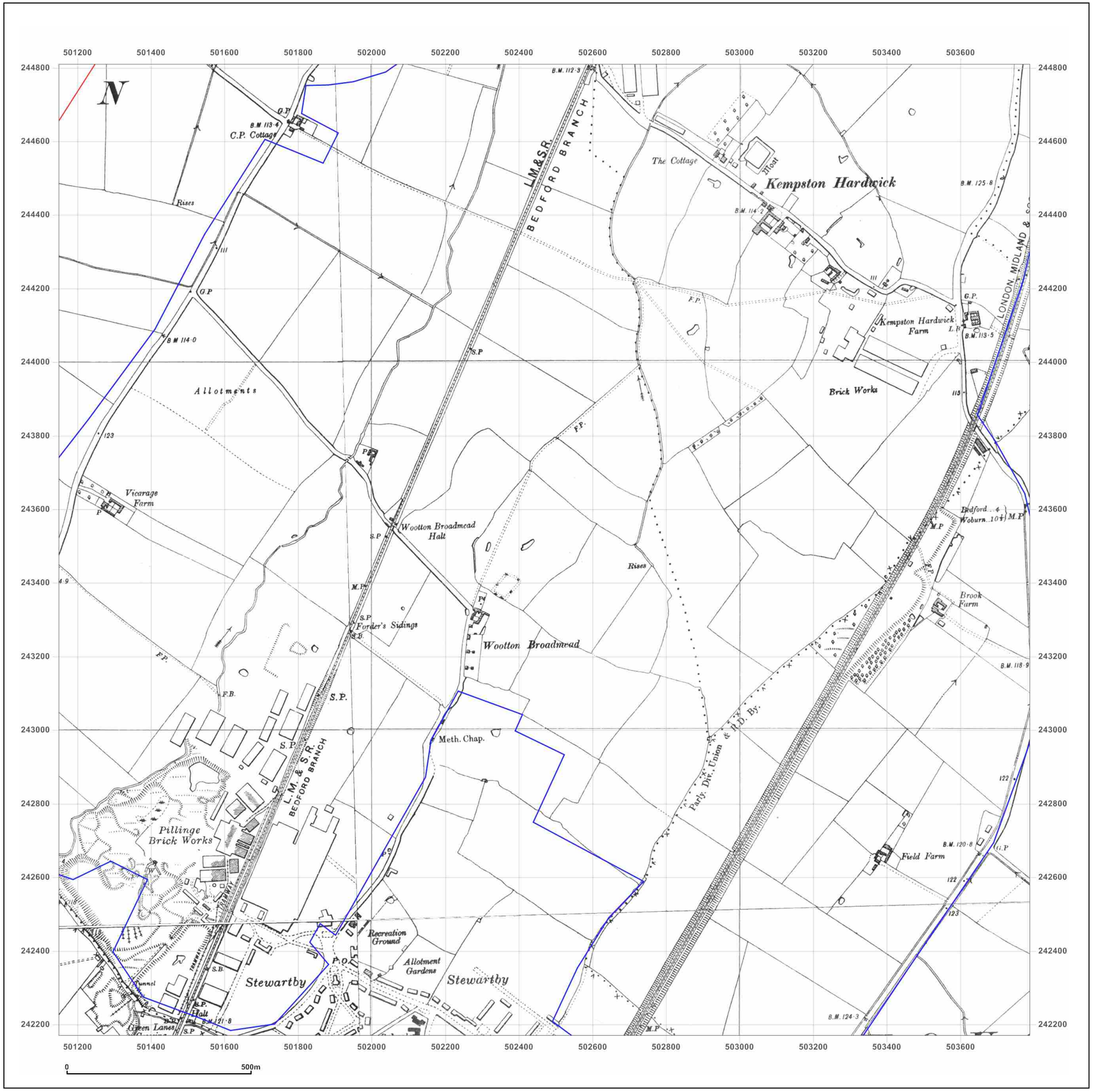

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FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

Surveyed 1881
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

Surveyed 1881
Revised 1938
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Revised 1938
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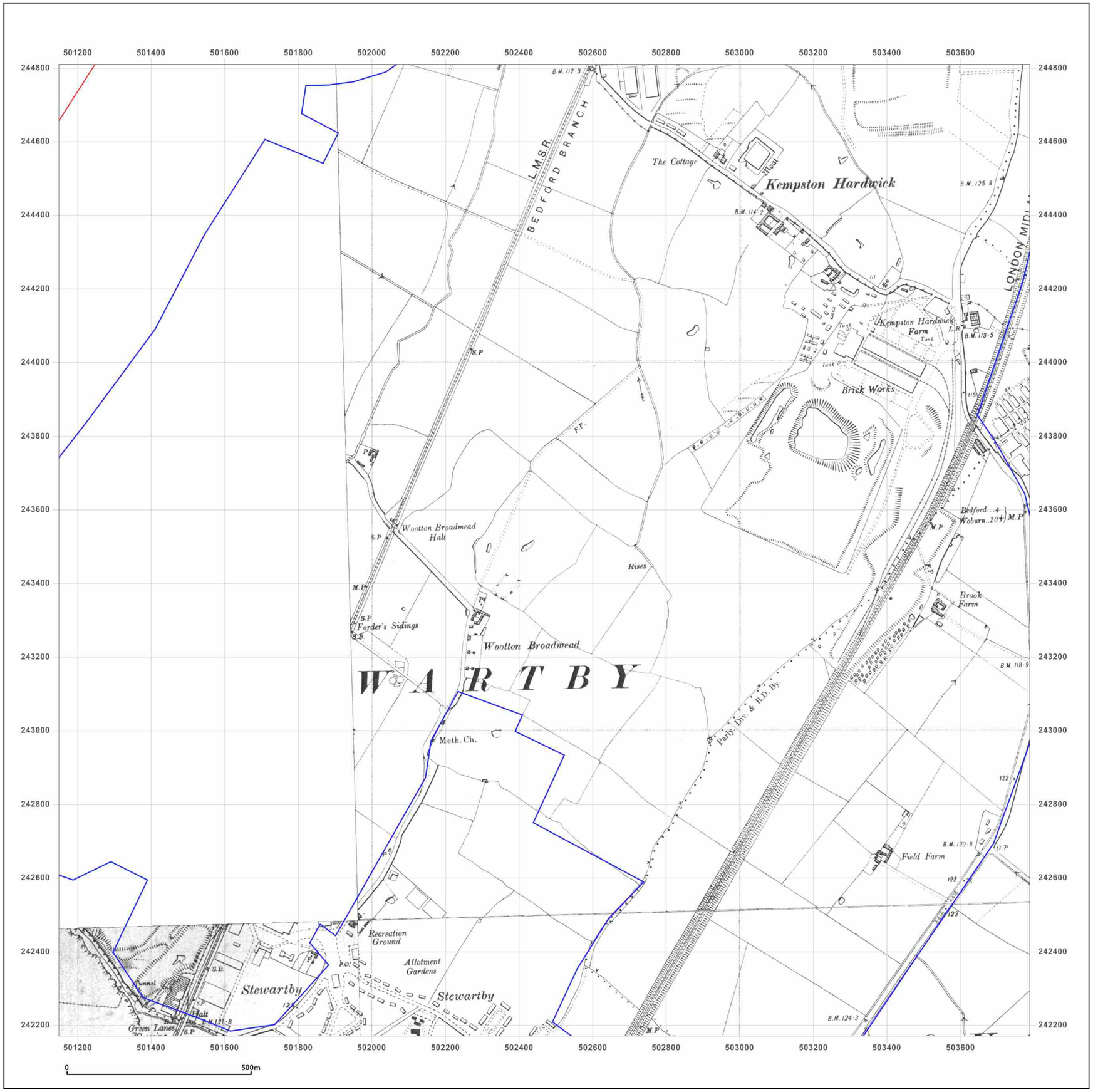

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Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: County Series

Map date: **1947-1948**

Scale: 1:10,560

Printed at: 1:10,560

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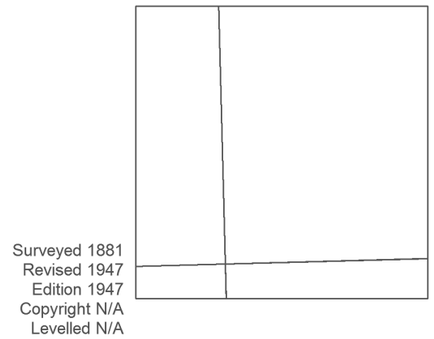

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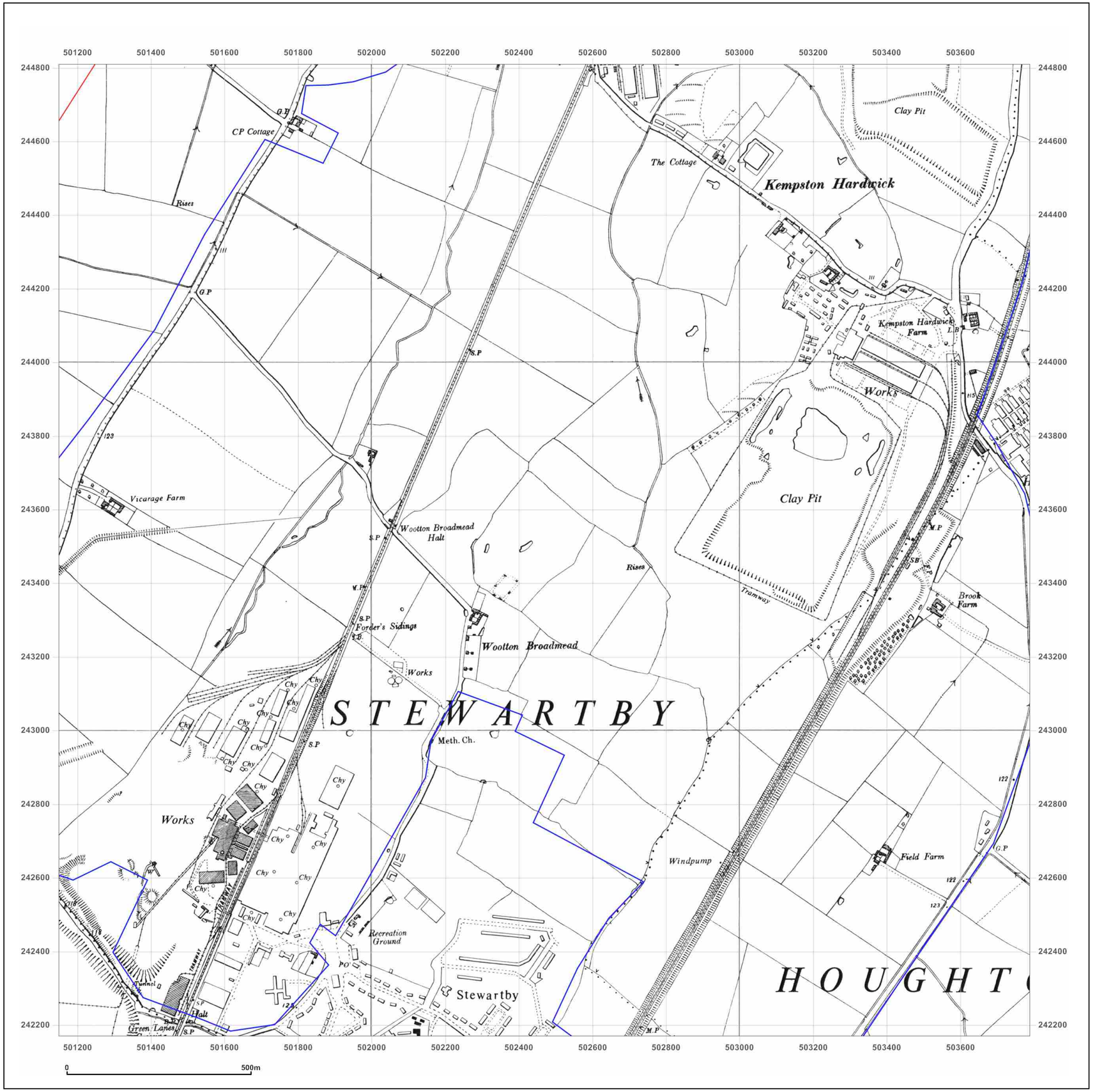

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: Provisional

Map date: **1959**

Scale: 1:10,560

Printed at: 1:10,560

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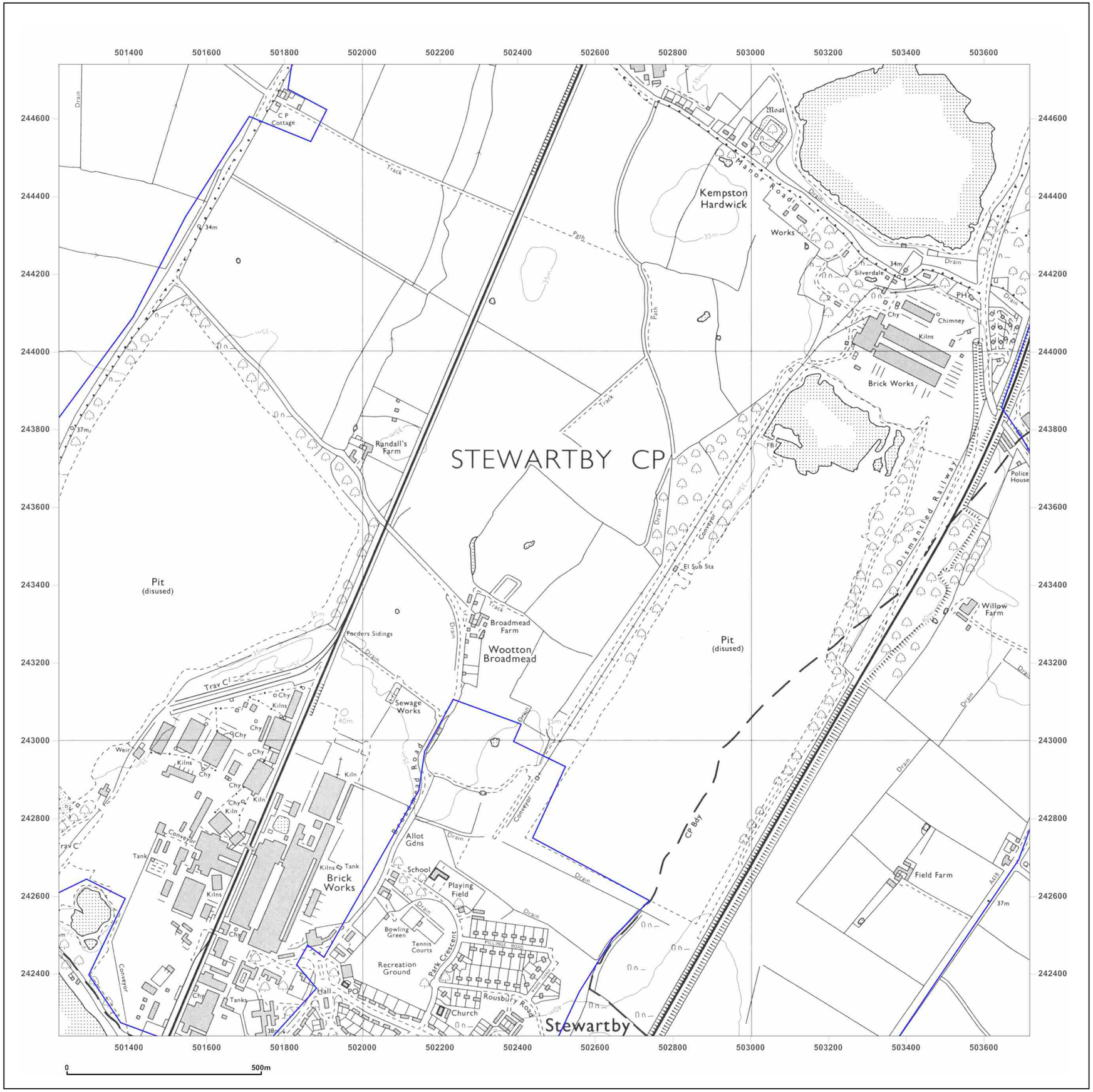

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: National Grid

Map date: **1980**

Scale: 1:10,000

Printed at: 1:10,000

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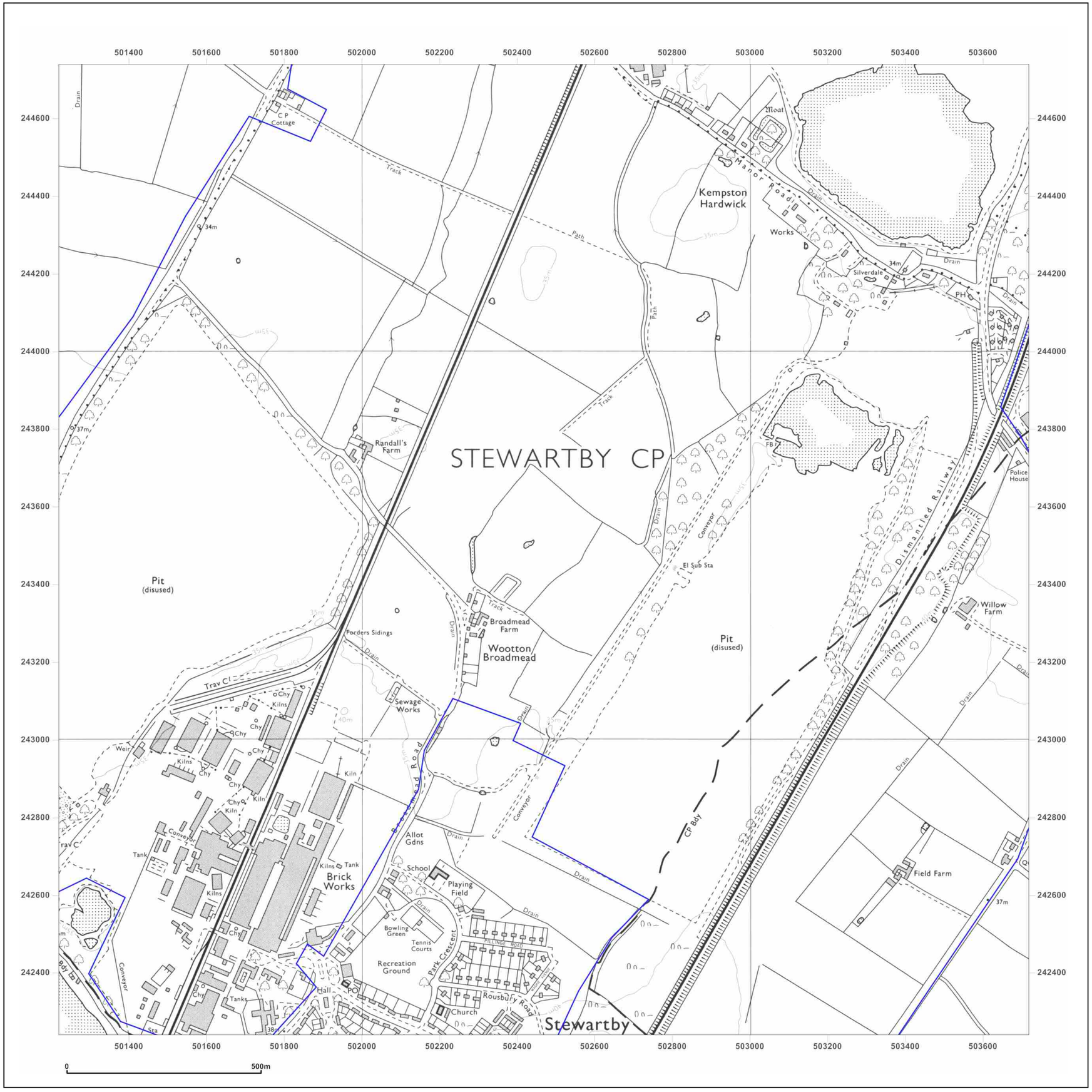

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: National Grid

Map date: **1989**

Scale: 1:10,000

Printed at: 1:10,000

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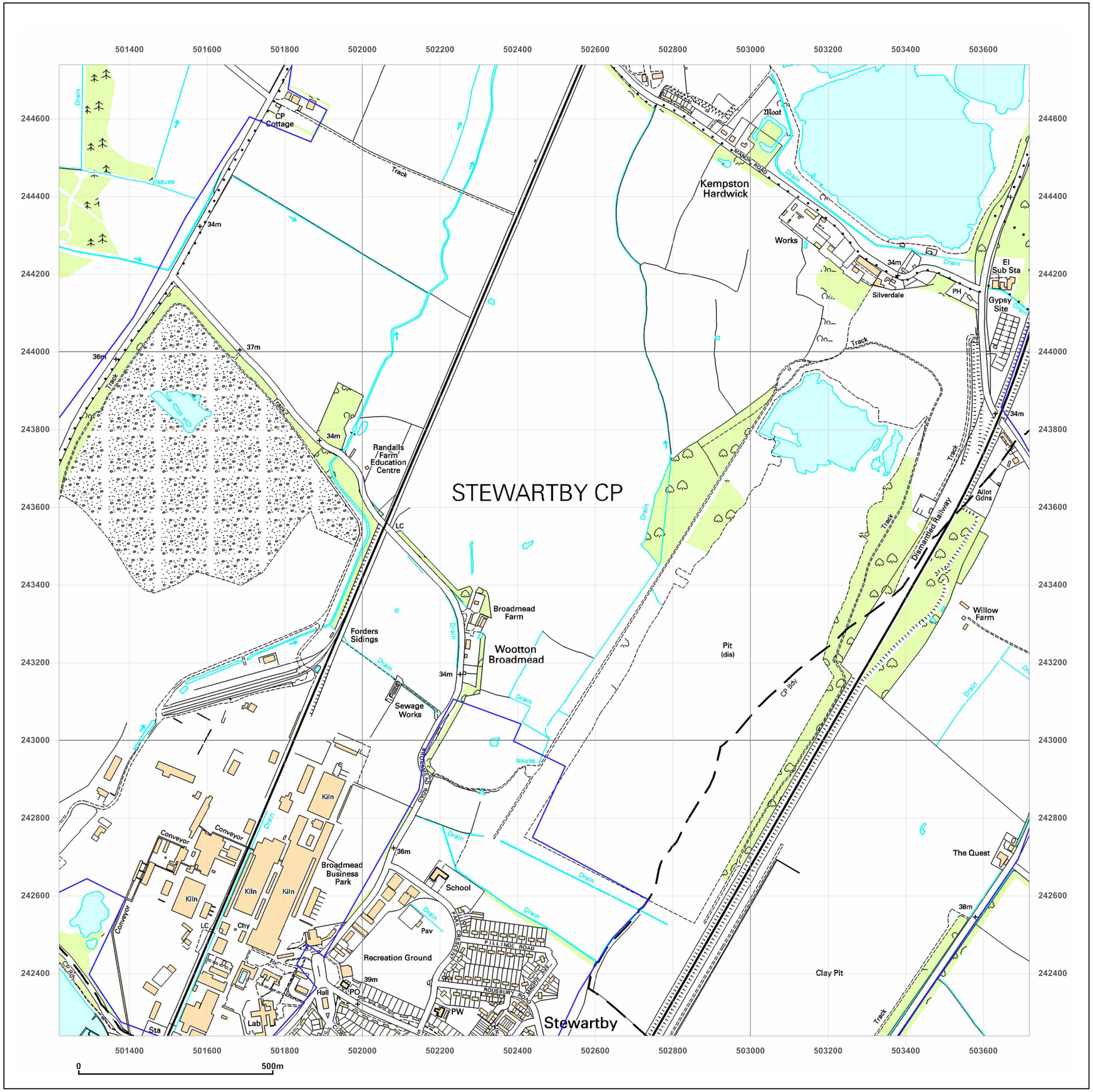

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

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2002

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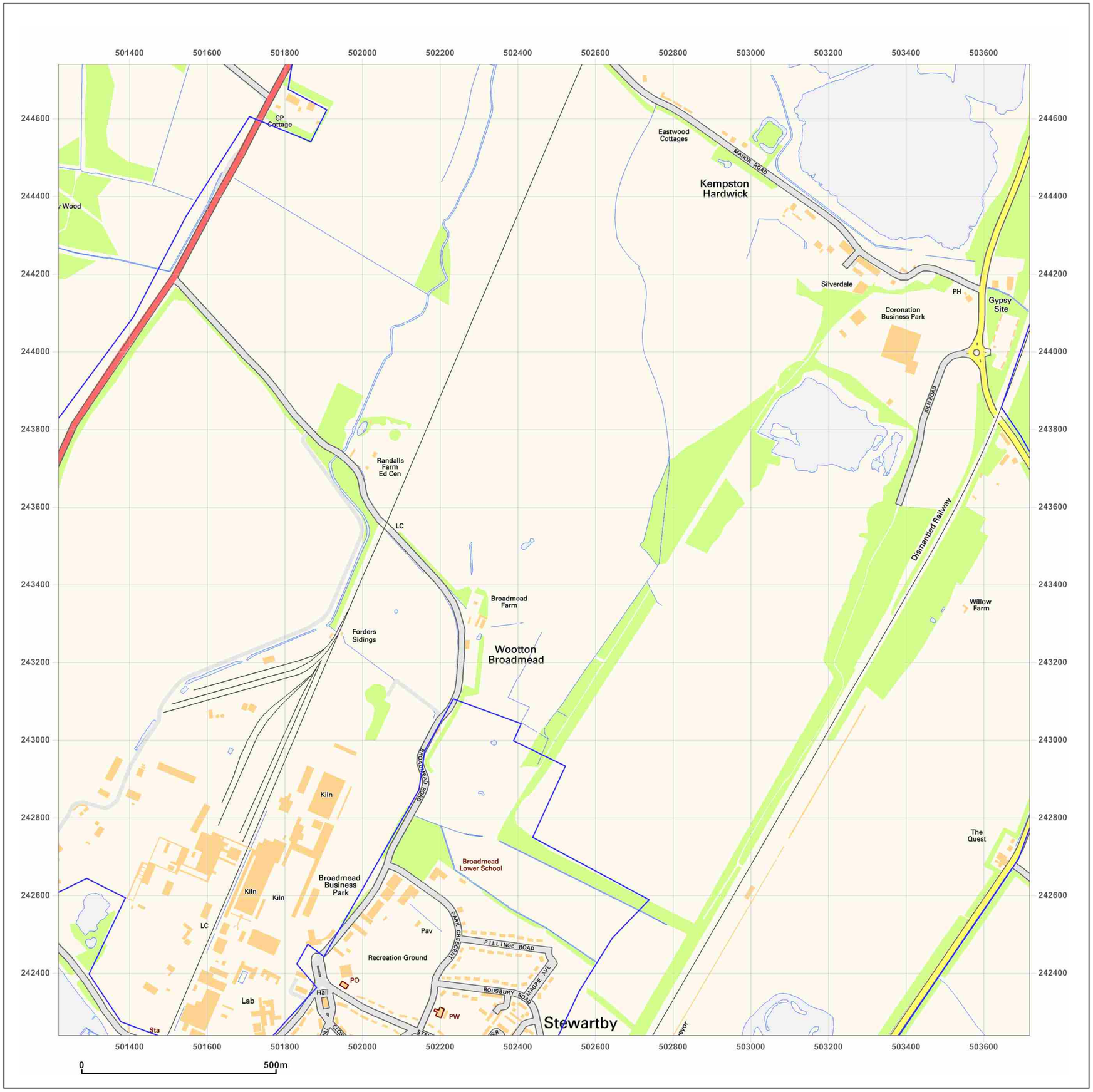

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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Production date: 10 October 2017

To view map legend click here *Legend*

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Brickworks Site, Bedford

Client Ref:
Report Ref: CMAPS-Bedford-5112-S4_SS_2_2
Grid Ref: 502468, 243489

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000

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2014

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Production date: 10 October 2017

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Appendix D Historical Borehole Logs

DRILLING METHOD.	GROUND LEVEL. METRES	GROUND LEVEL. FEET	MAP REFERENCE.	BORE HOLE NO.
Rotary core - Water flush			16SW 50145243 14	14/39

SITE AREA.

Stewartby L Field

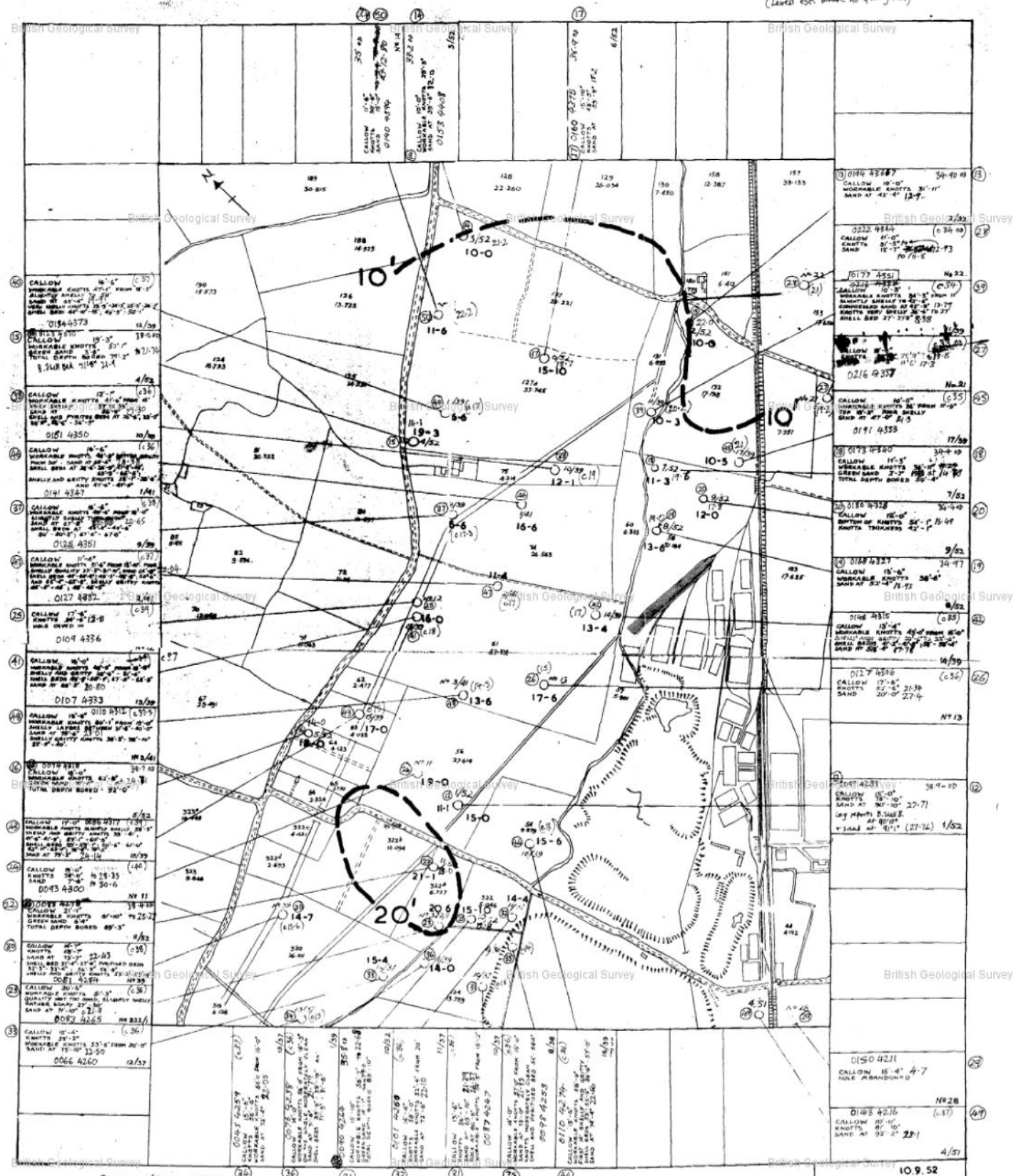
TL 04 SW/42

DEPTHS. METRES	DEPTHS. FEET	DESCRIPTION OF STRATA.		PERMEABILITY.	O.D. LEVEL. METRES	O.D. LEVEL. FEET	SYMB. LOG.
0 to 4.06m	0 to 13'4	Soil and Brown Weathered clay. Traces of Selenite					
4.06m to 17.78m	13'4 to 58'4	Stiff blue-grey Laminated clay	Lower Oxford clay				
17.78m to 21.11m	58'4 to 69'3	dense blue-grey Sand and clay	Kellaways Beds				

TL04SW/12-49

VICARAGE FARM AND L-FIELD AREA.

BGS 1:10,000 Record System No. ○
(All are TL04SW)
Levels of base LOWC in OD (Est. G.L.)
(Levels est. where no G.L. given)



CALLOW THICKNESS

RETEC. STEWARTBY
GEOLOGICAL LAB.
DRAWING NO. 442
10.9.52

18.6.91 GB.

SOIL MECHANICS DEPT. FOUNDATION ENGINEERING LTD.

BORE-HOLE LOG

TL 04 SW/239
0181 4324

Bore Hole No. 2 | Sheet No. 1 | Date (Start) 31·6·68

Location STEWARTBY | Bore Hole Dia. 8" and 6" | Ground Level 113·3' 34·5m

	DESCRIPTION	Reduced Level	Strata Thickness	Strata Depth	Legend	Sample No.	Sample Depth	REMARKS Depth to water level
MGRD	MADE GROUND (brick rubble)		1'-3"	1'-3"				See report for W.L.
	Firm to stiff orange, brown and grey silty CLAY		7'-9"	9'-0"		1	5' to 6'-6"	
						2	9' to 10'-6"	
						3	14' to 15'-3"	
								Water seepage at 18 ft.
LDXC						4	19' to 20'-6"	
	Very stiff to hard medium grey silty CLAY with numerous soft shells. Very strongly laminated horizontally and defoliates on drying. Some fissuring.		48'-0"			5	24' to 25'-6"	
						6	29' to 30'-6"	
						7	34' to 35'-6"	
						8	39' to 40'-6"	
								Water seepage at 41ft.
						9	44' to 45'-6"	
				(50'-0")		10	49' to 50'-6"	

BOREHOLE SCALE : 1" = 5' • : DISTURBED SAMPLE I : UNDISTURBED SAMPLE — STANDARD PENETRATION TEST

(Continued on sheet 2)

FIG. 2

SOIL MECHANICS DEPT. FOUNDATION ENGINEERING LTD

BORE-HOLE LOG

TL04SW/239

Bore Hole No. 2 | Sheet No. 2 | Date (Start)

Location STEWARTBY | Bore Hole Dia. 8" and 6" | Ground Level

DESCRIPTION	Reduced Level	Strata Thickness	Strata Depth	Legend	Sample No.	Sample Depth	REMARKS Depth to water level
LOXC CLAY (as on sheet 1)		48'-0"					6" casing taken to 63 ft. 5 ft. f.c. gravel placed in bottom of hole. Casing retracted to 58 ft. and permeability test started 1.10 p.m on 3.7.68
			17.4m 57'-0"		11	57' to 58'-3"	
Compact very slightly clayey fine SAND with clay seams.		6'-0"					
			19.2m 63'-0"				
				End of borehole.			

MB 1987

BOREHOLE SCALE : 1" = 5' • : DISTURBED SAMPLE ▮ : UNDISTURBED SAMPLE — STANDARD PENETRATION TEST

FIG. 2 (contd.)

DRILLING METHOD.

Rotary core - water flush.

GROUND LEVEL.

METRES	FEET
34.53	113.3

0181 4324

04SW ~~5019021325~~ BH 2

SITE AREA.

Stewartby L Field

TL 04 SW/239

DEPTHS. METRES	DEPTHS. FEET	DESCRIPTION OF STRATA.	PERMEABILITY.	O.D. LEVEL. METRES	O.D. LEVEL. FEET	SYMB.
0 to 0.38	0 to 1'3"	MADE ground brick rubble.				
0.38m to 2.74m	1'3" to 9'	Medium to stiff orange, brown and grey silty CLAY.				
2.74m to 17.37m	9 to 57'	Very stiff to hard medium grey silty CLAY with numerous soft shells. Very strongly laminated horizontally and deflates on drying some fissuring	lower oxford clay			
17.37m to 19.20m	57' to 63'	Impact very slightly clayey fine sand with clay seams	Kellaways Beds			

LOCATION S.2666	ELSTOW
BOREHOLE No.	
CLIENT	Central Electricity Generating Board
DRILLING METHOD	Shell and Auger (20.9 m); Rotary Drilling (20.9 - 31.0m)
GROUND LEVEL	34.88 m A.O.D.
DATE	21st - 27th September, 1972; 6th - 9th October 1972
SCALE 1 :	100
DIAMETER	150 mm & H.

	DESCRIPTION OF STRATA	SAMPLE	LEGEND	DEPTH	M/C	L.L.	P.L.	N	C/φ
LDxC	HARD grey very SILTY CLAY, shell traces.	26 ● 27 ●		13.0m 8.8m	12 7			I 51	
KS	Very DENSE grey fine silty SAND	28 ●		20.9m				I 52	
KIC	HARD dark grey laminated silty CLAY	84 %		23.4m				I 40 (no penetration)	KIB 4.6
Cb	MODERATELY WEAK grey shelly LIMESTONE; Run CLAY based (20mm) at 24.9m. ? Thin CLAY Band	84 %		25.2m					
BWC	HARD dark grey laminated silty CLAY becoming light grey and sandy at depth	91 %		27.1m					
BWL	MODERATELY STRONG grey shelly oolitic LIMESTONE; very shelly bands with clay pellets and lenses.	93 % 100		31.0m					
MB 1987		END OF BOREHOLE							

Note: Ground water was encountered at 19.3 m and rose quickly to 19.0 m below ground level.
Water level 24 hours after completion of soft ground boring was 8.1 m below ground level.
Piezometer was installed at 19.5 m below ground level.

G.K.N. FOUNDATIONS LTD.,
SITE INVESTIGATION DEPARTMENT

⊙ DISTURBED SAMPLE
| UNDISTURBED SAMPLE
⊕ BULK DISTURBED SAMPLE

Appendix E Exploratory Hole Records (2019)

5 John Charles Way
Leeds
LS12 6QA

Cable Percussion Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Tony Bedford Ltd	Co-ords: E501787.19 N243165.54
Project No. : 5112	Crew Name: P. Leppage	Drilling Equipment: Cable Percussive Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CP01	CP	35.42m AoD	MHP	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.25	35.17		MADE GROUND: Concrete with rebar.
		0.50 - 1.00	B					MADE GROUND: Reddish brown sandy GRAVEL. Sand is medium to coarse. Gravel is fine to medium sub-angular to angular of mostly brick and clinker, coal and sandstone. Occasional rootlets.
		1.00 - 1.45	B		1.00	34.42		MADE GROUND: Soft orangish grey slightly sandy slightly silty CLAY. Sand is fine to medium. Faint hydrocarbon odour. (Reworked Natural)
					1.60	33.82		Firm medium strength dark greenish brown slightly gravelly slightly silty CLAY with abundant shell fragments including bivalves, ammonites and other. Gravel is fine to medium angular of fragmented shells. (Lower Oxford Clay Fm)
		2.00 - 2.50	UT					
		2.50 - 2.55	D					
		3.00 - 3.45	D					*... becoming stiff, medium strength.*
		3.00	SPT	N=14 (1,2/3,4,3,4)				
		4.00 - 4.45	D					*... becoming high strength.*
		4.00	SPT	N=16 (2,2/3,4,4,5)				
		5.00 - 5.45	D					
		5.00	SPT	N=24 (3,4/6,5,6,7)				
		6.00	SPT	N=29 (3,5/7,6,8,8)				
					6.45	28.97		End of Borehole at 6.45m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		6.45	150								

Remarks

Hand dug pit from ground level to 1.0mbgl (1.5hr). No water added. Groundwater encountered at 1.0mbgl with a fast inflow, rising to 0.7mbgl.

5 John Charles Way
Leeds
LS12 6QA

Cable Percussion Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Tony Bedford Ltd	Co-ords: E501642.67 N243123.35
Project No. : 5112	Crew Name: P.Leppage	Drilling Equipment: Cable Percussive Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CP02	CP	35.56m AoD	MHP	1:50	Sheet 1 of 1

Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Stratum Description
			0.20	35.36	MADE GROUND: Concrete with rebar.
0.50 - 1.00	B				MADE GROUND: Dark reddish brown slightly gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular of brick, coal and clinker. Cobbles are angular of brick.
1.00 - 1.45	B		1.00	34.56	
1.00	SPT	N=7 (1,2/2,1,2,2)			MADE GROUND: Loose greenish brown mottled yellow gravelly SAND. Sand is fine to medium . Gravel is fine angular of mostly coal and sandstone.
			1.50	34.06	MADE GROUND: Firm high strength light greyish to yellowish brown very sandy CLAY. Sand is fine. (Reworked Natural)
2.00 - 2.50	UT				
2.50 - 2.55	D		2.50	33.06	Stiff medium strength light grey thinly laminated silty CLAY with abundant shell fragments including bivalves, ammonites and other. (Lower Oxford Clay Fm)
3.00 - 3.45	D				
3.00	SPT	N=11 (1,1/2,3,3,3)			
4.00 - 4.50	UT				
4.50 - 4.55	D				
5.00 - 5.45	D				
5.00	SPT	N=14 (2,2/3,4,3,4)	5.30	30.26	Stiff medium strength dark grey thinly laminated silty CLAY with abundant shell fragments including ammonites, bivalves and other. (Lower Oxford Clay Fm)
6.00 - 6.45	D				*... becoming high strength.*
6.00	SPT	N=25 (3,4/5,6,7,7)			
			6.45	29.11	End of Borehole at 6.45m

Hole Diameter: Depth Base	Diameter	Casing Diameter: Depth Base	Diameter	Chiselling: Depth Top	Depth Base	Duration	Tool	Inclination and Orientation: Depth Top	Depth Base	Inclination	Orientation
6.45	200										

Remarks

Hand dug pit from ground level to 1.0mbgl (1.5hr). No water added. Groundwater encountered at 1.0mbgl with a fast inflow. Groundwater encountered at 5.3mbgl with a slow inflow.

5 John Charles Way
Leeds
LS12 6QA

Cable Percussion Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 06/01/2019
Location: Stewartby Bedford	Contractor: Tony Bedford Ltd	Co-ords: E501545.22 N243090.99
Project No. : 5112	Crew Name: P. Leppage	Drilling Equipment: Cable Percussive Rig

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CP03	CP	35.77m AoD	MHP	1:50	Sheet 1 of 1

Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Stratum Description
			0.20	35.57	MADE GROUND: Concrete with visible rebar.
0.50 - 1.00	B				MADE GROUND: Dark reddish brown slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to medium of mostly brick, with coal, clinker and wood.
1.00 - 1.50	UT		0.95	34.82	MADE GROUND: Soft greyish brown sandy CLAY. Sand is fine to medium. (Reworked Natural)
1.50	D				
2.00 - 2.45	D		1.90	33.87	MADE GROUND: Soft low strength light greyish brown mottled yellowish grey slightly sandy slightly gravelly CLAY. Gravel is fine angular of sandstone and quartzite. (Reworked Natural)
2.00	SPT	N=5 (1,1/1,1,1,2)			
3.00 - 3.45	D				
3.00	SPT	N=8 (1,2/2,2,2,2)			
			3.50	32.27	Firm thinly laminated medium medium strength dark grey silty CLAY with abundant fossils including ammonites, bivalves and shell fragments. Becoming stiff with depth. (Lower Oxford Clay Formation)
4.00 - 4.50	UT				
4.50	D				
5.00 - 5.45	D				*... becoming high strength.*
5.00	SPT	N=18 (3,2/4,4,5,5)			
6.00 - 6.45	D				
6.00	SPT	N=28 (3,4/6,7,8,7)			
			6.50	29.27	End of Borehole at 6.45m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Hand dug pit from ground level to 1.0mbgl (1.5hr). Ground level recorded as metres above ordnance datum (mAOD).

5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501498.38 N243079.19
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP01	TP	35.49m AoD	MHP	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.20	35.29		MADE GROUND: Concrete with 5mm rebar.
		0.40 - 0.45	ES		0.45	35.04		MADE GROUND: Light brown slightly gravelly SAND. Gravel is fine subangular of sandstone, quartzite and rare concrete.
		0.80		HSV=56				MADE GROUND: Greenish black slightly sandy CLAY. Sand is fine. Faint hydrocarbon odour. (Reworked Natural)
	▼	1.50 - 1.90	D		1.50	33.99		Yellowish brown slightly clayey gravelly SAND. Gravel is fine to medium angular of sandstone. Very wet.
					1.90	33.59		Firm becoming stiff thinly laminated greenish grey mottled purplish grey slightly gravelly silty CLAY with abundant shelly fragments including ammonites. (Lower Oxford Clay Fm)
		2.50 - 2.80	D					*at 2.50m BGL... clay is of high plasticity.*
					3.95	31.54		End of Trial Pit at 3.95m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	0.95	Poor stability between 1.50 - 1.90mbgl.	None.				

Remarks

Trial pit unstable between 1.50 - 1.90mbgl. No groundwater encountered. Slight 'organic' hydrocarbon/ chemical odour between 0.45 - 1.50mbgl.

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5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501529.75 N243113.77
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP02	TP	35.94m AoD	MHP	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								MADE GROUND: Concrete with 5mm rebar.
					0.35	35.59		MADE GROUND: Reddish brown slightly gravelly SAND. Gravel is rare angular of brick and flint. Occasional pieces of cloth and plastic.
					0.75	35.19		MADE GROUND: Reddish brown very gravelly SAND with a medium cobble content. Gravel is fine of brick and coal. Cobbles are angular of brick.
	▼	1.60 - 1.80 1.60	ES	HSV=62	1.60	34.34		*... groundwater seepage, with slight hydrogen sulphide odour.*
		1.80 - 2.00	D		1.80	34.14		MADE GROUND: Firm dark blackish green silty CLAY. Strong hydrocarbon odour. Firm grey silty CLAY (Lower Oxford Clay Fm).
					3.20	32.74		End of Trial Pit at 3.20m

1 2 3 4 5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.10	0.80	OK.	None.				

Remarks

Trial pit has good stability. Grey coloured groundwater seepage at 1.50mbgl. Slight hydrocarbon odour between 1.55 - 1.60mbgl.

5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501601.32 N243107.54
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP03	TP	35.50m AoD	MHP	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								MADE GROUND: Concrete with 8mm rebar.
					0.30	35.20		
					0.40	35.10		MADE GROUND: Greyish black slightly gravelly SAND. Gravel is fine angular of brick.
								MADE GROUND: Reddish brown slightly gravelly SAND. Gravel is fine of brick. (Brick Fill)
		0.70 - 0.90	ES		0.70	34.80		MADE GROUND: Blackish grey very gravelly SAND. Gravel is mostly fine angular of coal. Very wet.
								... groundwater encountered at 0.70mbgl.
		0.95 - 1.10	D		0.95	34.55		Firm thinly laminated dark greyish brown silty CLAY with abundant shell fragments including ammonites, bivalves and others.
		1.65 - 1.75	D					
					3.80	31.70		End of Trial Pit at 3.80m

1 2 3 4 5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	0.95	Poor stability.	None.				

Remarks

Trial pit unstable between 1.65 - 1.90mbgl and 1.90 - 2.50mbgl. Groundwater seepage encountered between 0.70 - 0.90mbgl. Slight hydrocarbon odour between 0.70 - 0.90mbgl.

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5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501669.55 N243122.97
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP04	TP	35.66m AoD	MHP	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.15	35.51		MADE GROUND: Concrete with 8mm rebar.
	▼	0.40 - 0.60 0.40 - 0.60	D ES		0.40	35.26		MADE GROUND: Brownish red gravelly SAND with low cobble content. Gravel is fine to coarse angular of brick. Cobbles are angular of brick.
								MADE GROUND: Dark greyish black sandy GRAVEL. Gravel is fine to medium angular to subangular of coal, clinker and mixed lithology. *... groundwater seepage at 0.40mbgl.*
		1.00 - 1.40 1.00 - 1.40 1.20 - 1.40	B D ES		1.00	34.66		MADE GROUND: Firm light grey mottled yellow very sandy CLAY. Sand is fine to medium. (Reworked Natural)
					3.40	32.26		End of Trial Pit at 3.40m

1 2 3 4 5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.20	0.95	Good stability.	None.				

Remarks

Trial pit has good stability. Groundwater seepage at 0.40mbgl. No visual or olfactory signs of hydrocarbon contamination.

AGS

5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501749.52 N243153.68
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP06	TP	35.54m AoD		1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.20 - 0.30	ES		0.11	35.43		MADE GROUND: Concrete with 10mm rebar. *... blue plastic sheeting.*
	▼				0.45	35.09		MADE GROUND: Orangish brown to blackish brown gravelly SAND with low cobble content. Gravel is fine to coarse of angular brick. Cobbles are angular of brick. MADE GROUND: Dark greyish black very gravelly SAND. Gravel is fine angular of coal, clinker and mixed lithology. Very wet. Slight organis odour. *,,, groundwater seepage at 0.45mbgl.*
		1.80 - 2.00	D		1.10	34.44		MADE GROUND: Light grey silty CLAY. Becoming firm with depth. (Reworked Natural)
		2.50 - 2.70	D		2.40	33.14		Firm to stiff greenish grey thinly laminated CLAY with abundant shelly fragments including bivalves, ammonites and other. (Lower Oxford Clay Fm) *at 2.50m BGL... clay is of high plasticity.*
					4.20	31.34		End of Trial Pit at 4.20m

Dimensions: Pit Length	Pit Width	Trench Support and Comment: Pit Stability	Shoring Used	Remarks	Pumping Data: Date	Rate	Remarks
		Good stability.	None.				

Remarks

Trial pit has good stability. Groundwater seepage at 0.45mbgl. Very slight hydrocarbon odour between 0.45 - 1.10mbgl.

5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501846.56 N243171.80
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP07	TP	35.81m AoD		1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10 - 0.30	ES					MADE GROUND: Light reddish grey GRAVEL with occasional rootlets. Gravel is medium to coarse subangular of mostly granite. (Railway Ballast)
		0.50 - 0.70	D		0.50	35.31		MADE GROUND: Soft light grey mottled yellowish grey silty CLAY. (Reworked Natural) *at 0.50m BGL ... clay is of high plasticity.*
		1.55 - 1.95	D		1.55	34.26		*... unable to penetrate with HSV.* Firm dark greyish green thinly laminated silty CLAY with abundant shelly fragments including bivalves, ammonites and other. (Lower Oxford Clay Fm)
					3.70	32.11		End of Trial Pit at 3.70m

1 2 3 4 5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.10	0.85	Good stability.	None.				

Remarks

Trial pit has good stability. No groundwater encountered. No visual or olfactory signs of hydrocarbon contamination.

AGS

5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501810.36 N243201.10
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP08	TP	35.66m AoD	MHP	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.15 - 0.20	ES		0.15	35.51		MADE GROUND: Grey GRAVEL. Gravel is medium to coarse angular to subangular of granite (Railway Ballast).
					0.50	35.16		MADE GROUND: Dark reddish brown sandy GRAVEL with low cobble content. Sand is reddish brown. Gravel is fine to medium angular to sub-angular of mostly brick. Cobbles are angular of brick.
		0.60 - 0.70 0.65	D	HSV=92				MADE GROUND: Soft medium and high strength light grey mottled yellowish grey sandy CLAY. (Reworked Natural)
		1.00		HSV=71				
		2.20 - 3.70	B		2.20	33.46		Stiff dark grey thinly laminated silty CLAY with abundant shell fragments including ammonites, bivalves and other. (Lower Oxford Clay Fm)
								at 2.50m BGL ... clay is of high plasticity.
					3.95	31.71		End of Trial Pit at 3.95m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
1.40	0.90	Good stability.	None.				

Remarks

Trial pit has good stability. No groundwater encountered. No visual or olfactory signs of hydrocarbon contamination.

5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501867.11 N243176.69
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP09	TP	36.38m AoD	MHP	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.10	ES		0.10	36.28		MADE GROUND: Black bituminous hardstanding.
		0.30 - 0.50 0.30 - 0.50	D ES					MADE GROUND: Reddish brown sandy GRAVEL with occasional rootlets. Gravel is fine to medium angular of mostly brick, clinker and coal.
		1.20 - 1.50	D		1.20	35.18		MADE GROUND: Light grey mottled yellowish grey slightly sandy slightly gravelly CLAY. Gravel is fine of sandstone. (Reworked Natural)
					2.10	34.28		Stiff greenish to blueish grey thinly laminated CLAY with abundant shell fragments including bivalves, ammonites and other. (Lower Oxford Clay Fm)
					4.10	32.28		End of Trial Pit at 4.10m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	0.80	Good stability.	None.				

Remarks

Trial pit has good stability. No groundwater encountered. No visual or olfactory signs of hydrocarbon contamination.

5 John Charles Way
Leeds
LS12 6QA

Trial Pit Log

Project Name: Former Shanks Railway Sidings	Client: Cloud Wing (UK) Limited and Renewi PLC	Date: 05/01/2019
Location: Stewartby Bedford	Contractor: Devonshire Diggers Ltd	Co-ords: E501889.91 N243217.45
Project No. : 5112	Crew Name: Martin	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP10	TP	35.95m AoD	MHP	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.15	ES		0.15	35.80		MADE GROUND: Grass over light brown SAND with abundant rootlets (TOPSOIL).
		0.30 - 0.40	D		0.50	35.45		MADE GROUND: Dark blackish grey very gravelly SAND. Gravel is fine angular of coal and occasional clinker.
		0.85 - 0.90	B		0.85	35.10		MADE GROUND: Reddish brown slightly gravelly SAND. Gravel is fine angular of brick.
		0.85 - 0.90	D					MADE GROUND: Soft medium strength light grey mottled yellowish grey sandy CLAY. Sand is fine to coarse. (Reworked Natural)
		0.90		HSV=58				*at 0.85m BGL ... clay is of low plasticity.*
					1.40	34.55		Firm thinly laminated dark blueish grey CLAY with abundant fossil fragments including bivalves, ammonites and other. (Lower Oxford Clay Fm)
								... becoming stiff to very stiff.
					3.70	32.25		End of Trial Pit at 3.70m

1 2 3 4 5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.10	1.00	Good stability.	None.				

Remarks

Trial pit has good stability. No groundwater encountered. No visual or olfactory signs of hydrocarbon contamination.

Appendix F Chemical Analysis and HazWaste™ Certificates

Certificate of Analysis

Certificate Number 19-02514

27-Feb-19

Client JPG (Leeds) LTD
Civil & Structural Engineers
5 John Charles Way
Leeds
LS12 6QA

Our Reference 19-02514

Client Reference 5112 SHANKS

Order No (not supplied)

Contract Title (not supplied)

Description 11 Soil samples, 6 Leachate samples.

Date Received 11-Feb-19

Date Started 11-Feb-19

Date Completed 27-Feb-19

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

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

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458034	1458035	1458036	1458037	1458038	1458039	1458040
			Sample ID	TP01	TP02	TP03	TP04	TP04	TP06	TP07
			Depth	0.40-0.45	1.60-1.80	0.70-0.90	0.40-0.60	1.20-1.40	0.20-0.30	0.10-0.30
			Other ID							
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Asbestos Quantification	DETSC 1102	0					Y			
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	17	15	13	17	5.1	8.6	4.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.3	0.3	0.6	0.3	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	30	53	15	30	32	25	30
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	22	25	190	350	28	45	77
Lead	DETSC 2301#	0.3	mg/kg	23	20	21	380	14	16	20
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.13	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	21	37	34	39	33	16	16
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	89	110	58	120	73	63	100
Inorganics										
pH	DETSC 2008#			11.6	7.5	7.7	8.3	7.7	11.8	8.8
Acid / Alkali Reserve	DETSC 2011*	1	Oh/100g	< 1.0					1.2	
Calorific Value	DETSC 5008	1	MJ/kg			16.1	5.6		< 1.0	
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.8	3.7	12	6.3	3.1	4.0	0.9
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	6.0	36	7.0	8.4	11	5.1	4.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	120	860	440	330	2100	210	360
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5			
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2	< 1.2	< 1.2			
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5			
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4	< 3.4	28			
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	28			
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9	< 0.9	< 0.9			
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5	< 0.5	< 0.5			
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6	< 0.6	< 0.6			
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4	< 1.4	< 1.4			
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10			
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg		< 10	< 10	28			
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01				
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01				
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01				
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01				

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458034	1458035	1458036	1458037	1458038	1458039	1458040
			Sample ID	TP01	TP02	TP03	TP04	TP04	TP06	TP07
			Depth	0.40-0.45	1.60-1.80	0.70-0.90	0.40-0.60	1.20-1.40	0.20-0.30	0.10-0.30
			Other ID							
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 1.0	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 1.0	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 1.0	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 1.0	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.1	< 0.1	< 1.0	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.6	< 0.1	< 1.0	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	3.7	< 0.1	< 1.0	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	3.4	< 0.1	< 1.0	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.2	< 0.1	< 1.0	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.5	< 0.1	< 1.0	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.5	< 0.1	< 1.0	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	1.5	< 0.1	< 1.0	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	3.4	< 0.1	< 1.0	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.4	< 0.1	< 1.0	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.4	< 0.1	< 1.0	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.5	< 0.1	< 1.0	< 0.1
Coronene	DETSC 3301*	0.1	mg/kg							
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	28	< 1.6	< 16.0	< 1.6
PCBs										
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg			< 0.01				
PCB 52	DETSC 3401#	0.01	mg/kg			< 0.01				
PCB 101	DETSC 3401#	0.01	mg/kg			< 0.01				
PCB 118	DETSC 3401#	0.01	mg/kg			< 0.01				
PCB 153	DETSC 3401#	0.01	mg/kg			< 0.01				
PCB 138	DETSC 3401#	0.01	mg/kg			< 0.01				
PCB 180	DETSC 3401#	0.01	mg/kg			< 0.01				
PCB 7 Total	DETSC 3401#	0.01	mg/kg			< 0.01				
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Subcontracted Analysis										
mecoprop	$*	0.1	mg/kg		<0.10	<0.10				

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458041	1458042	1458043	1458044
			Sample ID	TP08	TP09	TP09	TP10
			Depth	0.15-0.20	0.30-0.50	0.00-0.10	0.00-0.15
			Other ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sampling Date	06/02/19	06/02/19	06/02/19	06/02/19
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Asbestos Quantification	DETSC 1102	0					
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	12	14		26
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.8		0.4
Chromium	DETSC 2301#	0.15	mg/kg	34	37		59
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	61	27		23
Lead	DETSC 2301#	0.3	mg/kg	26	19		25
Mercury	DETSC 2325#	0.05	mg/kg	0.08	< 0.05		< 0.05
Nickel	DETSC 2301#	1	mg/kg	25	25		28
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5		< 0.5
Zinc	DETSC 2301#	1	mg/kg	88	83		100
Inorganics							
pH	DETSC 2008#			10.7	8.2		8.2
Acid / Alkali Reserve	DETSC 2011*	1	Oh/100g				
Calorific Value	DETSC 5008	1	MJ/kg				< 1.0
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1		< 0.1
Organic matter	DETSC 2002#	0.1	%	2.0	2.1		4.0
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	4.7	6.2		9.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1500	1900		210
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg				
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg				
Aromatic C5-C35	DETSC 3072*	10	mg/kg				
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg				
Benzene	DETSC 3321#	0.01	mg/kg				
Ethylbenzene	DETSC 3321#	0.01	mg/kg				
Toluene	DETSC 3321#	0.01	mg/kg				
Xylene	DETSC 3321#	0.01	mg/kg				

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458041	1458042	1458043	1458044
			Sample ID	TP08	TP09	TP09	TP10
			Depth	0.15-0.20	0.30-0.50	0.00-0.10	0.00-0.15
			Other ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sampling Date	06/02/19	06/02/19	06/02/19	06/02/19
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.4	0.1	< 0.1	0.1
Anthracene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.9	0.2	0.2	0.3
Pyrene	DETSC 3301	0.1	mg/kg	1.1	0.3	0.2	0.3
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.3	0.1	< 0.1	0.2
Chrysene	DETSC 3301	0.1	mg/kg	0.4	0.2	< 0.1	0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.5	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.4	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Coronene	DETSC 3301*	0.1	mg/kg			< 0.1	
PAH Total	DETSC 3301	1.6	mg/kg	4.4	< 1.6	< 1.6	< 1.6
PCBs							
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg				
PCB 52	DETSC 3401#	0.01	mg/kg				
PCB 101	DETSC 3401#	0.01	mg/kg				
PCB 118	DETSC 3401#	0.01	mg/kg				
PCB 153	DETSC 3401#	0.01	mg/kg				
PCB 138	DETSC 3401#	0.01	mg/kg				
PCB 180	DETSC 3401#	0.01	mg/kg				
PCB 7 Total	DETSC 3401#	0.01	mg/kg				
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3		< 0.3
Subcontracted Analysis							
mecoprop	$*	0.1	mg/kg				

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458035	1458036
			Sample ID	TP02	TP03
			Depth	1.60-1.80	0.70-0.90
			Other ID		
			Sample Type	SOIL	SOIL
			Sampling Date	06/02/19	06/02/19
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458035	1458036
			Sample ID	TP02	TP03
			Depth	1.60-1.80	0.70-0.90
			Other ID		
			Sample Type	SOIL	SOIL
			Sampling Date	06/02/19	06/02/19
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
SVOCs					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458035	1458036
			Sample ID	TP02	TP03
			Depth	1.60-1.80	0.70-0.90
			Other ID		
			Sample Type	SOIL	SOIL
			Sampling Date	06/02/19	06/02/19
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

			Lab No	1458045	1458046	1458047	1458048	1458049	1458050
			Sample ID	TP01	TP02	TP03	TP04	TP09	TP09
			Depth	0.40-0.45	1.60-1.80	0.70-0.90	0.40-0.60	0.30-0.50	0.00-0.10
			Other ID						
			Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
			Sampling Date	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19	06/02/19
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Preparation									
NRA Leachate Preparation	DETSC 1009*			Y	Y	Y	Y	Y	Y
Metals									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.6	0.51	0.66	1.1	0.66	
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Chromium, Dissolved	DETSC 2306	0.25	ug/l	1.7	< 0.25	0.42	0.38	< 0.25	
Copper, Dissolved	DETSC 2306	0.4	ug/l	3.6	1.4	0.9	1.7	1.3	
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.22	< 0.09	< 0.09	0.18	< 0.09	
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.1	0.56	0.46	0.32	1.2	
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3	3.0	< 1.3	< 1.3	4.1	
Inorganics									
pH	DETSC 2008			10.2	8.7	8.5	8.4	7.8	
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20	< 20	< 20	< 20	
Sulphate as SO4	DETSC 2055	0.1	mg/l	5.6	64	34	29	240	
PAHs									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	0.05	< 0.05	< 0.05	0.12	
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.10	< 0.01	
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	0.05	< 0.01	0.02	0.02	
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	0.04	< 0.01	0.02	< 0.01	
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.05	0.02	0.17	0.03	
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	0.01	< 0.01	0.13	0.01	
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.03	0.01	0.41	0.02	
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.02	< 0.01	0.37	0.02	
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.25	< 0.01	
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	0.01	< 0.01	0.32	0.01	
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.01	< 0.01	0.68	0.01	
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.02	< 0.01	0.26	0.02	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.41	< 0.01	
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.01	< 0.01	0.84	< 0.01	
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.19	< 0.01	
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	0.02	< 0.01	0.68	0.01	
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	0.36	< 0.20	4.9	0.31	
Phenols									
Phenol	DETSC 3451*	0.5	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1458034	TP01 0.40-0.45	SOIL	NAD	none	Colin Patrick
1458035	TP02 1.60-1.80	SOIL	NAD	none	Colin Patrick
1458036	TP03 0.70-0.90	SOIL	NAD	none	Colin Patrick
1458037	TP04 0.40-0.60	SOIL	Chrysotile	bundle of Chrysotile fibres	Colin Patrick
1458038	TP04 1.20-1.40	SOIL	NAD	none	Colin Patrick
1458039	TP06 0.20-0.30	SOIL	NAD	none	Colin Patrick
1458040	TP07 0.10-0.30	SOIL	NAD	none	Colin Patrick
1458041	TP08 0.15-0.20	SOIL	NAD	none	Colin Patrick
1458042	TP09 0.30-0.50	SOIL	NAD	none	Colin Patrick
1458044	TP10 0.00-0.15	SOIL	NAD	none	Colin Patrick

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

Summary of Asbestos Quantification Analysis
Soil Samples

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract Title

Lab No	1458037
Sample ID	TP04
Depth	0.40-0.60
Other ID	
Sample Type	SOIL
Sampling Date	06/02/19
Sampling Time	

Test	**Method**	**Units**	
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	**0.005**
Gravimetric Quantification (a)	DETSC 1102	Mass %	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	0.005
Quantification by PCOM (c)	DETSC 1102	Mass %	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na
Breakdown of Gravimetric Analysis (a)			
Mass of Sample		g	197.45
ACMs present*		type	
Mass of ACM in sample		g	
% ACM by mass		%	
% asbestos in ACM		%	
% asbestos in sample		%	
Breakdown of Detailed Gravimetric Analysis (b)			
% Amphibole bundles in sample		Mass %	na
% Chrysotile bundles in sample		Mass %	0.005
Breakdown of PCOM Analysis (c)			
% Amphibole fibres in sample		Mass %	na
% Chrysotile fibres in sample		Mass %	na
Breakdown of Potentially Respirable Fibre Analysis (d)			
Amphibole fibres		Fibres/g	na
Chrysotile fibres		Fibres/g	na

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
# denotes deviating sample

Information in Support of the Analytical Results

Our Ref 19-02514
Client Ref 5112 SHANKS
Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1458034	TP01 0.40-0.45 SOIL	06/02/19	GJ 250ml, PT 1L		
1458035	TP02 1.60-1.80 SOIL	06/02/19	GJ 250ml, PT 1L		
1458036	TP03 0.70-0.90 SOIL	06/02/19	GJ 250ml, PT 1L		
1458037	TP04 0.40-0.60 SOIL	06/02/19	GJ 250ml, PT 1L		
1458038	TP04 1.20-1.40 SOIL	06/02/19	GJ 250ml, PT 1L		
1458039	TP06 0.20-0.30 SOIL	06/02/19	GJ 250ml, PT 1L		
1458040	TP7 0.10-0.30 SOIL	06/02/19	GJ 250ml, PT 1L		
1458041	TP08 0.15-0.20 SOIL	06/02/19	GJ 250ml, PT 1L		
1458042	TP09 0.30-0.50 SOIL	06/02/19	PT 1L		Naphthalene, PAH FID
1458043	TP09 0.00-0.10 SOIL	06/02/19	GJ 250ml, PT 1L		
1458044	TP10 0.00-0.15 SOIL	06/02/19	GJ 250ml, PT 1L		
1458045	TP01 0.40-0.45 LEACHATE	06/02/19	GJ 250ml, PT 1L		
1458046	TP02 1.60-1.80 LEACHATE	06/02/19	GJ 250ml, PT 1L		
1458047	TP03 0.70-0.90 LEACHATE	06/02/19	GJ 250ml, PT 1L		
1458048	TP04 0.40-0.60 LEACHATE	06/02/19	GJ 250ml, PT 1L		
1458049	TP09 0.30-0.50 LEACHATE	06/02/19	PT 1L		
1458050	TP10 0.00-0.10 LEACHATE	06/02/19	GJ 250ml, PT 1L		

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

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Certificate of Analysis

Certificate Number	19-06071
Client	JPG (Leeds) LTD Civil & Structural Engineers 5 John Charles Way Leeds LS12 6QA

08-Apr-19

Our Reference	19-06071
Client Reference	(not supplied)
Order No	(not supplied)
Contract Title	Stewartby
Description	One Water sample.
Date Received	01-Apr-19
Date Started	01-Apr-19
Date Completed	08-Apr-19
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Water Samples

Our Ref 19-06071
Client Ref
Contract Title Stewartby

Lab No	1482207
Sample ID	CP02
Depth	
Other ID	
Sample Type	WATER
Sampling Date	29/03/19
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.57
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Chromium, Hexavalent	DETSC 2203	0.007	mg/l	< 0.007
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.2
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.11
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	6.0
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.46
Zinc, Dissolved	DETSC 2306	1.3	ug/l	41
Inorganics				
pH	DETSC 2008			6.8
Cyanide, Free	DETSC 2130	20	ug/l	< 20
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	2.6
Chloride	DETSC 2055	0.1	mg/l	72
Sulphate as SO4	DETSC 2055	0.1	mg/l	690
Sulphide	DETSC 2208	10	ug/l	< 10
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	1.8

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 19-06071
Client Ref
Contract Title Stewartby

Lab No	1482207
Sample ID	CP02
Depth	
Other ID	
Sample Type	WATER
Sampling Date	29/03/19
Sampling Time	n/s

Test	Method	LOD	Units	
Acenaphthylene	DETSC 3304	0.01	ug/l	1.2
Acenaphthene	DETSC 3304	0.01	ug/l	0.49
Fluorene	DETSC 3304	0.01	ug/l	0.45
Phenanthrene	DETSC 3304	0.01	ug/l	14
Anthracene	DETSC 3304	0.01	ug/l	6.0
Fluoranthene	DETSC 3304	0.01	ug/l	15
Pyrene	DETSC 3304	0.01	ug/l	15
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	6.9
Chrysene	DETSC 3304	0.01	ug/l	8.8
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	15
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	14
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	5.3
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	8.5
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	12
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	7.6
PAH Total	DETSC 3304	0.2	ug/l	130
PCBs				
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0
Phenols				
Phenol	DETSC 3451*	0.5	ug/l	< 0.50
Acid Herbicides				
Mecoprop	DETSC 3448*	0.02	ug/l	< 0.02

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 19-06071
Client Ref
Contract Title Stewartby

Lab No	1482207
Sample ID	CP02
Depth	
Other ID	
Sample Type	WATER
Sampling Date	29/03/19
Sampling Time	n/s

Test	Method	LOD	Units	
VOCs				
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4
Chloroform	DETSC 3432	1	ug/l	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1
Benzene	DETSC 3432	1	ug/l	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
Toluene	DETSC 3432	1	ug/l	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1
Styrene	DETSC 3432	1	ug/l	< 1
Bromoform	DETSC 3432	1	ug/l	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 19-06071
Client Ref
Contract Title Stewartby

Lab No	1482207
Sample ID	CP02
Depth	
Other ID	
Sample Type	WATER
Sampling Date	29/03/19
Sampling Time	n/s

Test	Method	LOD	Units	
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1
MTBE	DETSC 3432*	1	ug/l	< 1
SVOCs				
Phenol	DETSC 3434*	1	ug/l	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 19-06071
Client Ref
Contract Title Stewartby

Lab No	1482207
Sample ID	CP02
Depth	
Other ID	
Sample Type	WATER
Sampling Date	29/03/19
Sampling Time	n/s

Test	Method	LOD	Units	
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 19-06071
Client Ref
Contract Stewartby

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1482207	CP02 WATER	29/03/19	GB 1L, GV, PB 1L	pH/Cond/TDS (2 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial

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

Disposal

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

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

HazWasteOnline™

Waste Classification Report

S3M4W-5ES6S-G5TXD

Job name

5112 Former Shanks Railway

Description/Comments

Project

Site

Bedford

Related Documents

#	Name	Description
None		

Waste Stream Template

JPG CL WASTE STREAM V20

Classified by

Name:
Dominic Horne
Date:
28 Feb 2019 11:56 GMT
Telephone:
07814008742

Company:
JPG Leeds
5 John Charles Way
Leeds
LS12 6QA

Report

Created by: Dominic Horne
Created date: 28 Feb 2019 11:56 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01	0.40-0.45	Hazardous	HP 8	3
2	TP02	1.60-1.80	Non Hazardous		5
3	TP05	0.70-0.90	Non Hazardous		7
4	TP07	0.40-0.60	Non Hazardous		9
5	TP07[1]	1.20-1.40	Non Hazardous		11
6	TP09	0.20-0.30	Potentially Hazardous	HP 4, HP 8	13
7	TP10	0.10-0.30	Non Hazardous		15
8	TP11	0.15-0.20	Non Hazardous		17
9	TP12	0.30-0.50	Non Hazardous		19
10	TP12[1]	0.00-0.10	Non Hazardous		21
11	TP13	0.00-0.15	Non Hazardous		23

Classification of sample: TP01

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

Sample details

Sample Name:		LoW Code:	
TP01		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.40-0.45 m		Entry:	17 05 03 * (Soil and stones containing hazardous substances)

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.: 11.6 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	22.446	mg/kg	0.00224 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	23	mg/kg	1.56	35.876	mg/kg	0.0023 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		21	mg/kg	2.976	62.502	mg/kg	0.00625 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				89	mg/kg	2.774	246.899	mg/kg	0.0247 %		
11		pH			PH		11.6	pH		11.6	pH	11.6 pH		
12		pH: acid/alkali reserve			ACID_ALK_RES		<1	gNaOH		<1	gNaOH	<1gNaOH		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
15	•	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
16	•	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
17	•	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
18	•	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
19	•	fluoranthene		205-912-4	206-44-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
20	•	pyrene		204-927-3	129-00-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
21		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
22		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
23		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	•	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28	•	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		phenol	604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
											Total:	0.0429 %		

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 Deteminand - 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: TP02

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

Sample details

Sample Name:		LoW Code:	
TP02		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.60-1.80 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15	mg/kg	1.32	19.805	mg/kg	0.00198 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		53	mg/kg	1.462	77.462	mg/kg	0.00775 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	28.147	mg/kg	0.00281 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	20	mg/kg	1.56	31.196	mg/kg	0.002 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		37	mg/kg	2.976	110.122	mg/kg	0.011 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				110	mg/kg	2.774	305.156	mg/kg	0.0305 %		
11		pH			PH		7.5	pH		7.5	pH	7.5 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<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									
14	•	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-917-1	208-96-8									
15	•	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
16	•	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
17	•	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-581-5	85-01-8									
18	•	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-371-1	120-12-7									
19	•	fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-912-4	206-44-0									
20	•	pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
26	•	indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
28	•	benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-883-8	191-24-2									
29		phenol				0.4	mg/kg		0.4	mg/kg	0.00004 %		
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0566 %		

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: TP05

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

Sample details

Sample Name:		LoW Code:	
TP05		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.70-0.90 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	17.164	mg/kg	0.00172 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		190	mg/kg	1.126	213.919	mg/kg	0.0214 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	21	mg/kg	1.56	32.756	mg/kg	0.0021 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		34	mg/kg	2.976	101.193	mg/kg	0.0101 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.8	mg/kg	2.554	2.043	mg/kg	0.000204 %		
10		zinc { zinc chromate }	024-007-00-3				58	mg/kg	2.774	160.9	mg/kg	0.0161 %		
11		pH			PH		7.7	pH		7.7	pH	7.7 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<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									
14	•	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-917-1	208-96-8									
15	•	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
16	•	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
17	•	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-581-5	85-01-8									
18	•	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-371-1	120-12-7									
19	•	fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-912-4	206-44-0									
20	•	pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
26	•	indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
28	•	benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0543 %		

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: TP07

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

Sample details

Sample Name:		LoW Code:	
TP07		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.40-0.60 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	22.446	mg/kg	0.00224 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		350	mg/kg	1.126	394.061	mg/kg	0.0394 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	380	mg/kg	1.56	592.73	mg/kg	0.038 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.13	mg/kg	1.16	0.151	mg/kg	0.0000151 %		
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39	mg/kg	2.976	116.074	mg/kg	0.0116 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				120	mg/kg	2.774	332.898	mg/kg	0.0333 %		
11		pH			PH		8.3	pH		8.3	pH	8.3 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthylene		205-917-1	208-96-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
15	•	acenaphthene		201-469-6	83-32-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
16	•	fluorene		201-695-5	86-73-7		0.2	mg/kg		0.2	mg/kg	0.00002 %		
17	•	phenanthrene		201-581-5	85-01-8		2.1	mg/kg		2.1	mg/kg	0.00021 %		
18	•	anthracene		204-371-1	120-12-7		0.6	mg/kg		0.6	mg/kg	0.00006 %		
19	•	fluoranthene		205-912-4	206-44-0		3.7	mg/kg		3.7	mg/kg	0.00037 %		
20	•	pyrene		204-927-3	129-00-0		3.4	mg/kg		3.4	mg/kg	0.00034 %		
21		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		2.2	mg/kg		2.2	mg/kg	0.00022 %		
22		chrysene	601-048-00-0	205-923-4	218-01-9		2.5	mg/kg		2.5	mg/kg	0.00025 %		
23		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		2.5	mg/kg		2.5	mg/kg	0.00025 %		
24		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.5	mg/kg		1.5	mg/kg	0.00015 %		
25		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		3.4	mg/kg		3.4	mg/kg	0.00034 %		
26	•	indeno[123-cd]pyrene		205-893-2	193-39-5		2.4	mg/kg		2.4	mg/kg	0.00024 %		
27		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.4	mg/kg		0.4	mg/kg	0.00004 %		
28	•	benzo[ghi]perylene		205-883-8	191-24-2		2.5	mg/kg		2.5	mg/kg	0.00025 %		
29		phenol	604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
30		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		0.0048	mg/kg		0.0048	mg/kg	0.00000048 %		
											Total:	0.132 %		

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 Deteminand - 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: TP07[1]

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

Sample details

Sample Name:		LoW Code:	
TP07[1]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.20-1.40 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5.1	mg/kg	1.32	6.734	mg/kg	0.000673 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		32	mg/kg	1.462	46.77	mg/kg	0.00468 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	31.525	mg/kg	0.00315 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	14	mg/kg	1.56	21.837	mg/kg	0.0014 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		33	mg/kg	2.976	98.217	mg/kg	0.00982 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				73	mg/kg	2.774	202.513	mg/kg	0.0203 %		
11		pH			PH		7.7	pH		7.7	pH	7.7 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<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									
14	•	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-917-1	208-96-8									
15	•	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
16	•	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
17	•	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-581-5	85-01-8									
18	•	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-371-1	120-12-7									
19	•	fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-912-4	206-44-0									
20	•	pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
26	•	indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
28	•	benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0405 %		

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: TP09

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP09		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.20-0.30 m		Entry:	17 05 04 or 17 05 03 * (Soil and stones other than those mentioned in 17 05 03 or Soil and stones containing hazardous substances)

Hazard properties (substances considered hazardous until shown otherwise)

HP 4: Irritant - skin irritation and eye damage "waste which on application can cause skin irritation or damage to the eye"

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

Because of determinand:

pH: (conc.: 11.8 pH)

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.: 11.8 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.6	mg/kg	1.32	11.355	mg/kg	0.00114 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		25	mg/kg	1.462	36.539	mg/kg	0.00365 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		45	mg/kg	1.126	50.665	mg/kg	0.00507 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	16	mg/kg	1.56	24.957	mg/kg	0.0016 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16	mg/kg	2.976	47.62	mg/kg	0.00476 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
10		zinc { zinc chromate }	024-007-00-3				63	mg/kg	2.774	174.771	mg/kg	0.0175 %		
11		pH			PH		11.8	pH		11.8	pH	11.8 pH		
12		pH: acid/alkali reserve			ACID_ALK_RES		1.2	gNaOH		1.2	gNaOH	1.2 gNaOH		
13		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
14		naphthalene	601-052-00-2	202-049-5	91-20-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
15		acenaphthylene		205-917-1	208-96-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
16		acenaphthene		201-469-6	83-32-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
17		fluorene		201-695-5	86-73-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
18		phenanthrene		201-581-5	85-01-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
19		anthracene		204-371-1	120-12-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
20		fluoranthene		205-912-4	206-44-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
21		pyrene		204-927-3	129-00-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
22		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
23		chrysene	601-048-00-0	205-923-4	218-01-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
24		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
25		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
26		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
27		indeno[123-cd]pyrene		205-893-2	193-39-5		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
28		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
29		benzo[ghi]perylene		205-883-8	191-24-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
30		phenol	604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
											Total:	0.0357 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - 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: TP10

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

Sample details

Sample Name:		LoW Code:	
TP10		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.10-0.30 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		4.8	mg/kg	1.32	6.338	mg/kg	0.000634 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		77	mg/kg	1.126	86.693	mg/kg	0.00867 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	20	mg/kg	1.56	31.196	mg/kg	0.002 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16	mg/kg	2.976	47.62	mg/kg	0.00476 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				100	mg/kg	2.774	277.415	mg/kg	0.0277 %		
11		pH			PH		8.8	pH		8.8	pH	8.8 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<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									
14	•	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-917-1	208-96-8									
15	•	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
16	•	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
17	•	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-581-5	85-01-8									
18	•	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-371-1	120-12-7									
19	•	fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-912-4	206-44-0									
20	•	pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
26	•	indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
28	•	benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0487 %		

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: TP11

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

Sample details

Sample Name:		LoW Code:	
TP11		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.15-0.20 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.571	mg/kg	0.0000571 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		34	mg/kg	1.462	49.693	mg/kg	0.00497 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		61	mg/kg	1.126	68.679	mg/kg	0.00687 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	26	mg/kg	1.56	40.555	mg/kg	0.0026 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.08	mg/kg	1.16	0.0928	mg/kg	0.00000928 %		
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		25	mg/kg	2.976	74.407	mg/kg	0.00744 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				88	mg/kg	2.774	244.125	mg/kg	0.0244 %		
11		pH			PH		10.7	pH		10.7	pH	10.7 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
15	•	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
16	•	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
17	•	phenanthrene		201-581-5	85-01-8		0.4	mg/kg		0.4	mg/kg	0.00004 %		
18	•	anthracene		204-371-1	120-12-7		0.2	mg/kg		0.2	mg/kg	0.00002 %		
19	•	fluoranthene		205-912-4	206-44-0		0.9	mg/kg		0.9	mg/kg	0.00009 %		
20	•	pyrene		204-927-3	129-00-0		1.1	mg/kg		1.1	mg/kg	0.00011 %		
21		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.3	mg/kg		0.3	mg/kg	0.00003 %		
22		chrysene	601-048-00-0	205-923-4	218-01-9		0.4	mg/kg		0.4	mg/kg	0.00004 %		
23		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.5	mg/kg		0.5	mg/kg	0.00005 %		
24		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.3	mg/kg		0.3	mg/kg	0.00003 %		
25		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.4	mg/kg		0.4	mg/kg	0.00004 %		
26	•	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28	•	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		phenol	604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
											Total:	0.0488 %		

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: TP12

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

Sample details

Sample Name:		LoW Code:	
TP12		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.30-0.50 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	18.485	mg/kg	0.00185 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8	mg/kg	1.142	0.914	mg/kg	0.0000914 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		37	mg/kg	1.462	54.078	mg/kg	0.00541 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27	mg/kg	1.126	30.399	mg/kg	0.00304 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	19	mg/kg	1.56	29.636	mg/kg	0.0019 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		25	mg/kg	2.976	74.407	mg/kg	0.00744 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				83	mg/kg	2.774	230.254	mg/kg	0.023 %		
11		pH			PH		8.2	pH		8.2	pH	8.2 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
15	•	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
16	•	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
17	•	phenanthrene		201-581-5	85-01-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
18	•	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
19	•	fluoranthene		205-912-4	206-44-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
20	•	pyrene		204-927-3	129-00-0		0.3	mg/kg		0.3	mg/kg	0.00003 %		
21		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
22		chrysene	601-048-00-0	205-923-4	218-01-9		0.2	mg/kg		0.2	mg/kg	0.00002 %		
23		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	•	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28	•	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		phenol	604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
											Total:	0.0433 %		

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: TP12[1]

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

Sample details

Sample Name:		LoW Code:	
TP12[1]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.00-0.10 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
2	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
3	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
4	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
5	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
6	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
7	●	fluoranthene		205-912-4	206-44-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
8	●	pyrene		204-927-3	129-00-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
9		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
10		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
11		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
12		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
13		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
14	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
15		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
16	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
											Total:	0.00018 %		

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: TP13

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

Sample details

Sample Name:		LoW Code:	
TP13		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.00-0.15 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		26	mg/kg	1.32	34.328	mg/kg	0.00343 %		
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
3		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		59	mg/kg	1.462	86.232	mg/kg	0.00862 %		
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		23	mg/kg	1.126	25.895	mg/kg	0.00259 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	25	mg/kg	1.56	38.995	mg/kg	0.0025 %		
7		mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		**<LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		28	mg/kg	2.976	83.335	mg/kg	0.00833 %		
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3				100	mg/kg	2.774	277.415	mg/kg	0.0277 %		
11		pH			PH		8.2	pH		8.2	pH	8.2 pH		
12		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				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		**<LOD**
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
15	•	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
16	•	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
17	•	phenanthrene		201-581-5	85-01-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
18	•	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
19	•	fluoranthene		205-912-4	206-44-0		0.3	mg/kg		0.3	mg/kg	0.00003 %		
20	•	pyrene		204-927-3	129-00-0		0.3	mg/kg		0.3	mg/kg	0.00003 %		
21		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.2	mg/kg		0.2	mg/kg	0.00002 %		
22		chrysene	601-048-00-0	205-923-4	218-01-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
23		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26	•	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28	•	benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		phenol	604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
											Total:	0.0539 %		

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

Appendix A: Classifier defined and non CLP determinands

- **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

- **mercury(II) sulphide** (EC Number: 215-696-3, CAS Number: 1344-48-5)

Conversion factor: 1.16
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 , STOT RE 2 H373 , Acute Tox. 2 H300 , Acute Tox. 1 H310 , Acute Tox. 3 H331

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **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

- **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

- **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

- **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

- **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

- **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

- **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

- **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

- **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

- **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

- **pH: acid/alkali reserve** (CAS Number: ACID_ALK_RES)

Description/Comments: Appendix C4; unit: grams of sodium hydroxide (equivalent) per 100g of substance required to adjust the pH to the appropriate value
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings.

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides.

chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass.

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight.

mercury {mercury(II) sulphide}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight.

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

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight.

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}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide]

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2019.44.3788.7742 (13 Feb 2019)
HazWasteOnline Database: 2019.44.3788.7742 (13 Feb 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

STATISTICAL ASSESSMENT OF CHEMICAL ANALYSIS

The results of the chemical analysis have been assessed in accordance with CL:AIRE (Contaminated Land: Applications in Real Environments) 'Guidance on Comparing Soil Contamination Data with a Critical Concentration' published by the CIEH, May 2008.

This guidance provides a statistical approach to objectively evaluate the evidence for and against particular propositions/hypothesis and has the useful attribute of enabling decision makers to reach conclusions about the available evidence, with at least some understanding of the validity of the results.

The guidance approaches this in the context of assessing the results from two different perspectives, the Planning Scenario and Part 2A.

When assessing in terms of the Planning Scenario, the key question would be 'can we confidently say that the level of contamination on this land is low relative to some appropriate measure of risk?' Under Part 2A, the question would be 'can we confidently say that the level of contamination is high relative to some appropriate measure of risk?'

These questions are addressed through the use of formal hypothesis – the "Null Hypothesis" and the "Alternative Hypothesis".

This assessment will be carried out in accordance with the Planning Scenario, where the aim is to demonstrate 'suitability for use'. The Null Hypothesis is that the level of contamination is the same as, or higher than the critical concentration/GAC. The Alternative Hypothesis is that the level of contamination is lower than the critical concentration/GAC. Under Part 2A the opposite set of propositions are applicable.

By convention, the Null Hypothesis is the starting proposition against which the key question, as expressed by the Alternative Hypothesis, can be tested.

The assessment of the results relies on there being a normal distribution of results for a particular contaminant and that the data set under consideration is representative of the particular material which is being assessed. If more than one dataset is present, then the hypothesis should be applied individually for each data set.

Under the Planning Scenario, the statistical test is used to demonstrate that there is a 95% probability that the true population mean falls below the critical concentration/GAC.

Appropriate data sets must be created to enable the statistical testing to be carried out and three key elements must be considered prior to statistical analysis. These are as follows:

- Dealing with non-detects;
- Understanding the statistical distribution of data; and
- Dealing with outliers.

The results can then be assessed and the results will be compared against the following:

- Sample Mean – if the sample mean of the data set is in excess of the GAC then the Upper Confidence Limit of the true population mean will be higher than the critical concentration.
- 95% of the Upper Confidence Limit.
- One Sample T Test (parametric test) carried out at the 95% confidence level.

On the basis of these tests, the validity of the Null Hypothesis can be assessed.

Appendix G Geotechnical Test Results

LABORATORY REPORT

4043

Contract Number: PSL19/0986

Report Date: 18 April 2019

Client's Reference: 5112

Client Name: JPG
5 John Charles Way
Leeds
West Yorkshire
LS12 6QD

For the attention of: Molly Peckham

Contract Title: Shanks Railway Sidings

Date Received: 13/2/2019
Date Commenced: 13/2/2019
Date Completed: 5/3/2019

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)	A Watkins (Director)	R Berriman (Quality Manager)
		S. Biddleston
L Knight (Senior Technician)	L Pavey (Senior/Quality Technician)	S Biddleston (Senior Technician)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP01		D	1.50	1.90	Brown gravelly very clayey silty SAND.
TP01		D	2.50	2.80	Brown slightly gravelly slightly sandy CLAY.
TP03		D	0.70	0.90	MADE GROUND dark grey very sandy very silty gravel of ash.
TP03		D	1.65	1.75	Brown very gravelly very sandy CLAY.
TP04		D	1.00	1.40	Brown slightly gravelly slightly sandy CLAY.
TP06		D	2.50	2.70	Brown slightly gravelly slightly sandy CLAY.
TP06		D	1.80	2.00	Dark grey slightly gravelly CLAY.
TP07		D	0.50	0.70	Brown slightly gravelly slightly sandy CLAY.
TP07		D	1.55	1.95	Grey slightly gravelly CLAY.
TP09		D	0.30	0.50	MADE GROUND reddish brown very sandy very silty gravel.
TP09		D	1.20	1.50	Brown slightly gravelly sandy CLAY.
TP10		D	0.85	0.90	Brown slightly gravelly very sandy CLAY.
TP08		B	2.20	3.95	Grey slightly sandy CLAY.
TP08		D	0.60	0.70	Brown slightly gravelly CLAY.
CP01		U	2.00	2.50	Firm brown mottled grey CLAY.
CP02		U	2.00	2.50	Stiff brown mottled grey CLAY.
CP02		U	4.00	4.50	Firm brown mottled grey CLAY.
CP03		U	1.00	1.50	Firm brown mottled grey CLAY.
CP03		U	4.00	4.50	Firm grey CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

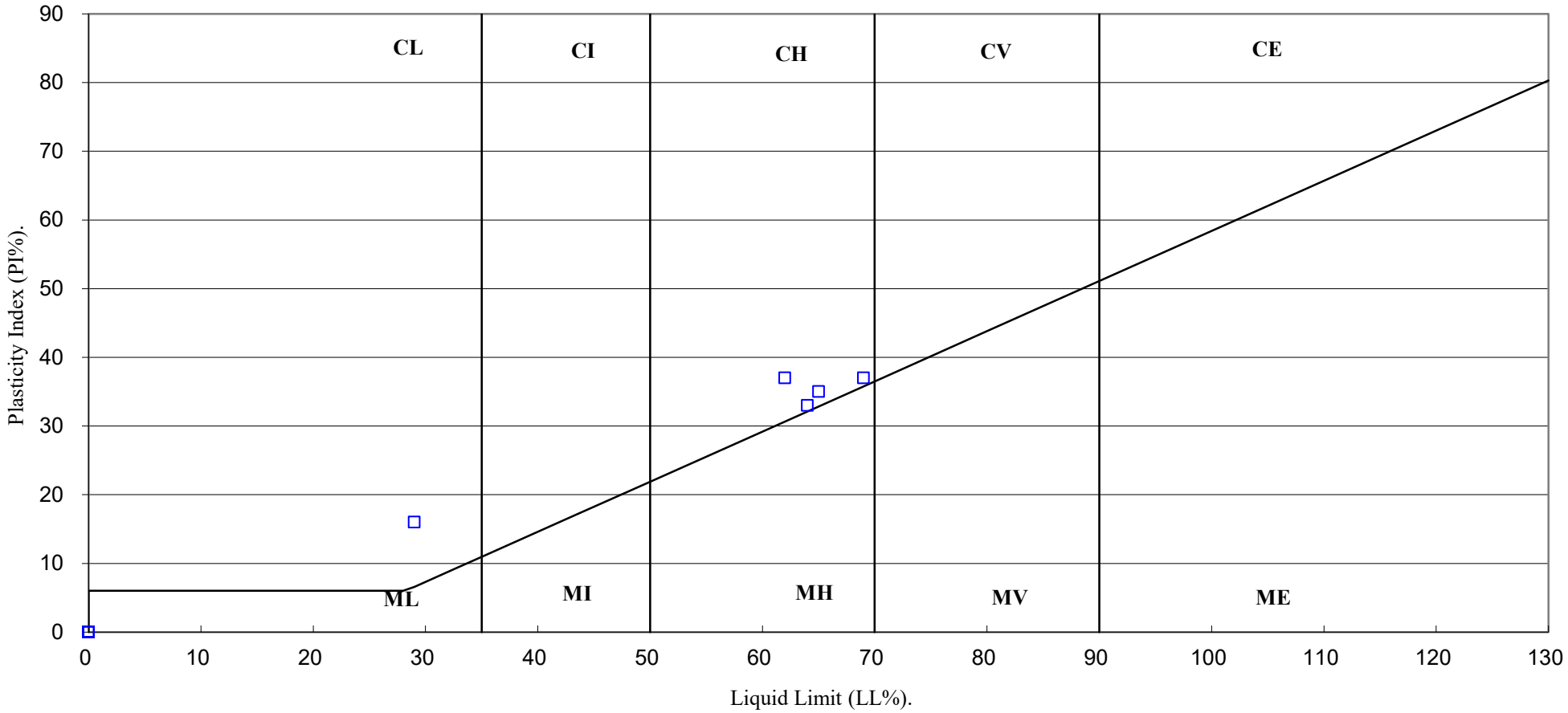
(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP01		D	1.50	1.90	22							
TP01		D	2.50	2.80	33			65	30	35	97	High plasticity CH.
TP03		D	0.70	0.90	50				NP			
TP03		D	1.65	1.75	29							
TP04		D	1.00	1.40	39							
TP06		D	2.50	2.70	29			69	32	37	97	High plasticity CH.
TP06		D	1.80	2.00	31							
TP07		D	0.50	0.70	33			62	25	37	98	High plasticity CH.
TP07		D	1.55	1.95	24							
TP09		D	0.30	0.50	28							
TP09		D	1.20	1.50	21							
TP10		D	0.85	0.90	16			29	13	16	82	Low plasticity CL.
TP08		B	2.20	3.95	26			64	31	33	100	High plasticity CH.
TP08		D	0.60	0.70	29							

SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0896
			Client Ref: 5112

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0896
			Client Ref: 5112

PARTICLE SIZE DISTRIBUTION TEST

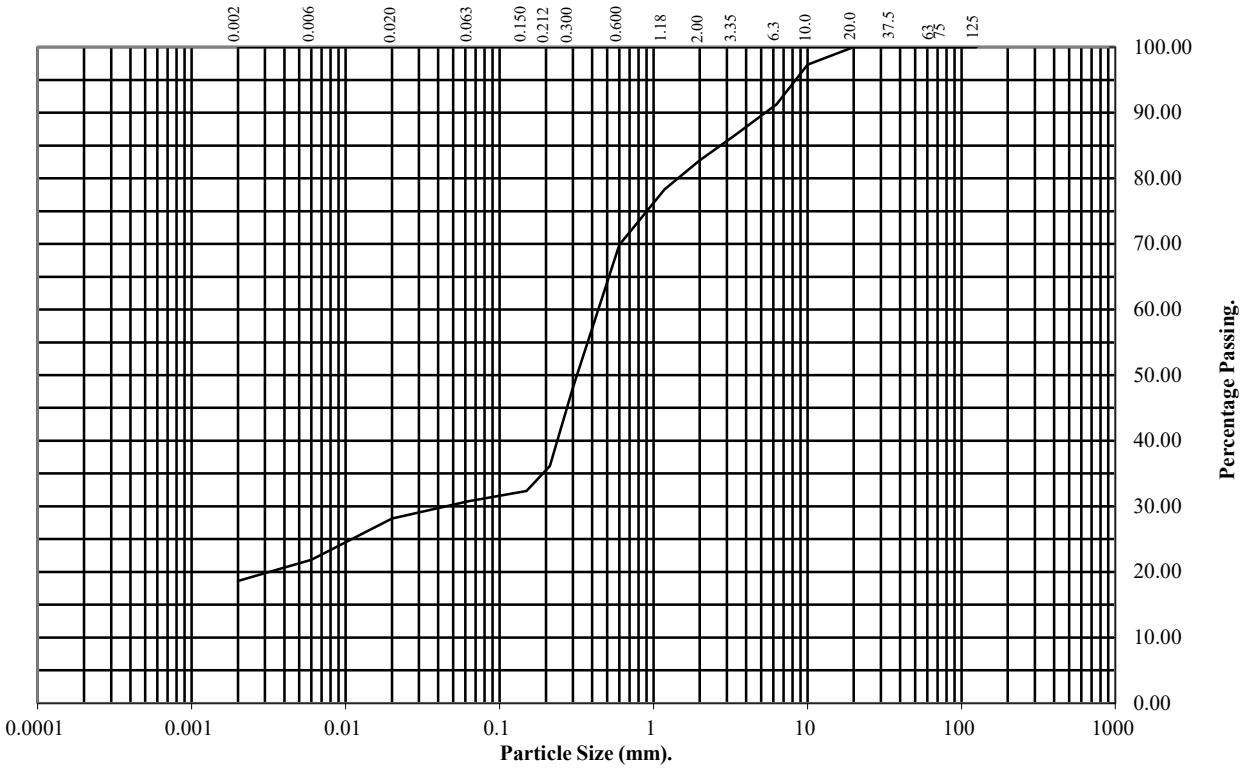
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP01 **Top Depth (m):** 1.50

Sample Number: **Base Depth(m):** 1.90

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	91
3.35	87
2	83
1.18	78
0.6	70
0.3	48
0.212	36
0.15	32
0.063	31

Particle Diameter	Percentage Passing
0.02	28
0.006	22
0.002	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	52
Silt	12
Clay	19

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Shanks Railway Sidings**	**Contract No:** PSL19/0986 **Client Ref:** 5112

PARTICLE SIZE DISTRIBUTION TEST

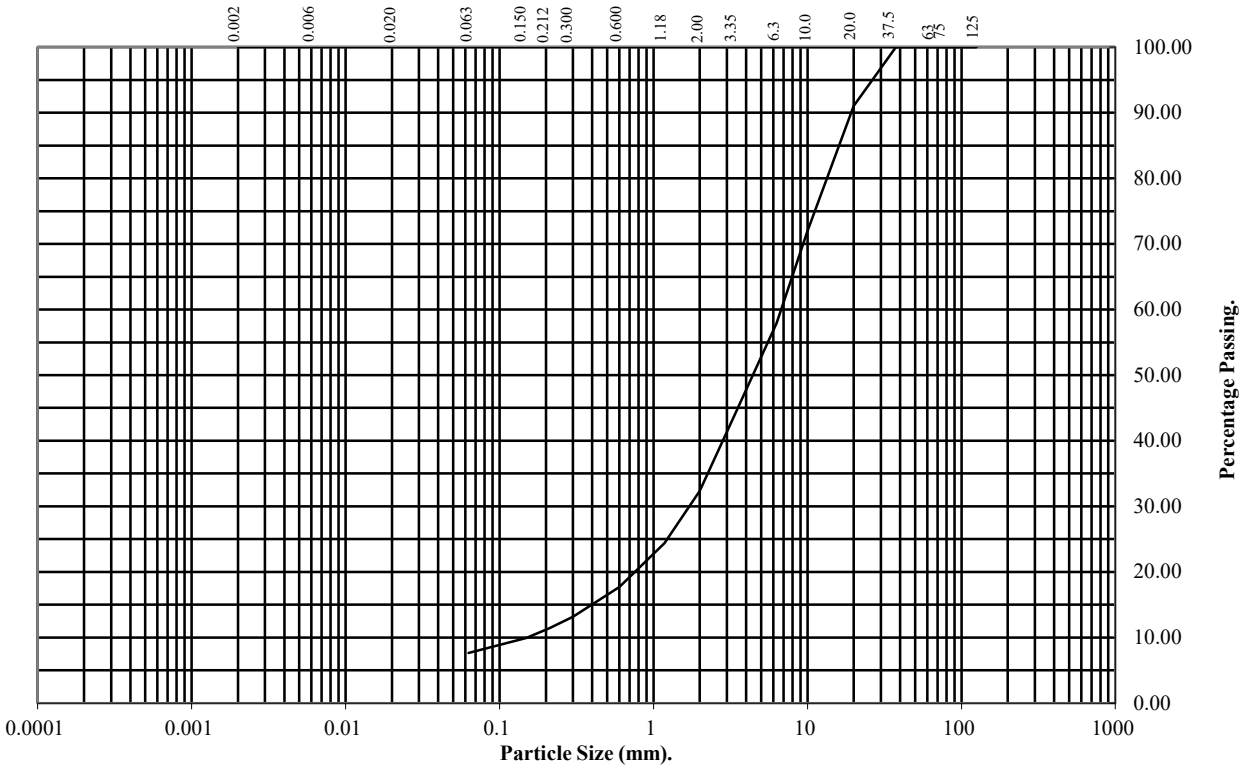
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP03 **Top Depth (m):** 0.70

Sample Number: **Base Depth(m):** 0.90

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	91
10	72
6.3	58
3.35	44
2	32
1.18	24
0.6	18
0.3	13
0.212	11
0.15	10
0.063	8

Soil Fraction	Total Percentage
Cobbles	0
Gravel	68
Sand	24
Silt/Clay	8

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Shanks Railway Sidings**	**Contract No:** PSL19/0986 **Client Ref:** 5112

PARTICLE SIZE DISTRIBUTION TEST

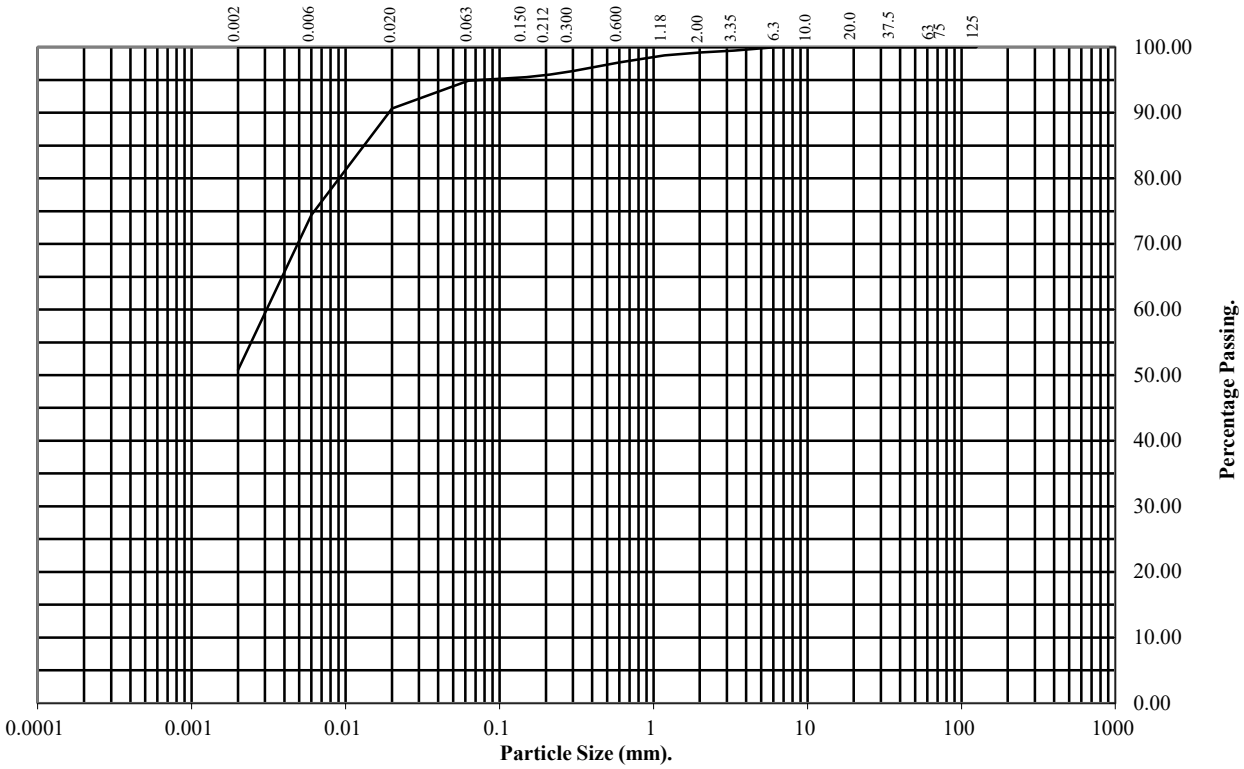
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP06 **Top Depth (m):** 2.50

Sample Number: **Base Depth(m):** 2.70

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	99
1.18	99
0.6	98
0.3	96
0.212	96
0.15	95
0.063	95

Particle Diameter	Percentage Passing
0.02	91
0.006	74
0.002	51

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	4
Silt	44
Clay	51

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Shanks Railway Sidings**	**Contract No:** PSL19/0986 **Client Ref:** 5112

PARTICLE SIZE DISTRIBUTION TEST

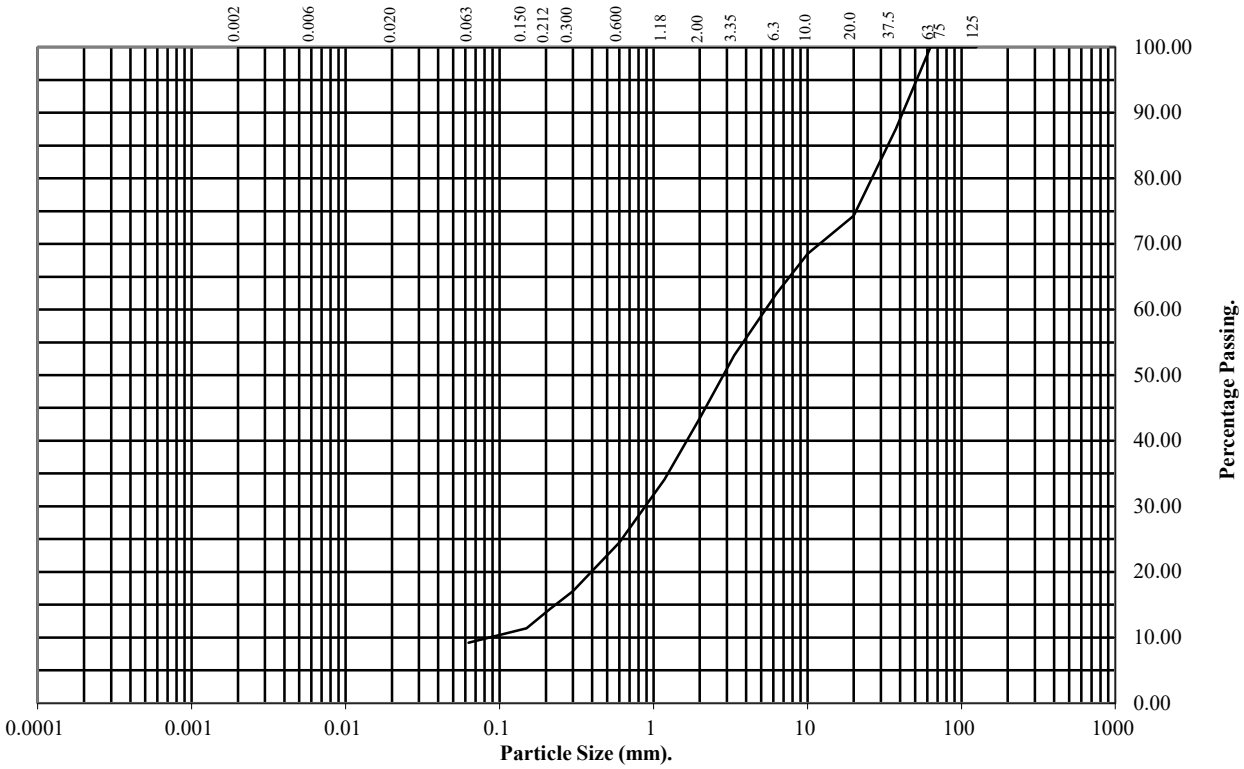
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP09 **Top Depth (m):** 0.30

Sample Number: **Base Depth(m):** 0.50

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	88
20	74
10	68
6.3	62
3.35	53
2	43
1.18	34
0.6	24
0.3	17
0.212	14
0.15	11
0.063	9

Soil Fraction	Total Percentage
Cobbles	0
Gravel	57
Sand	34
Silt/Clay	9

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Shanks Railway Sidings**	**Contract No:** PSL19/0986 **Client Ref:** 5112

PARTICLE SIZE DISTRIBUTION TEST

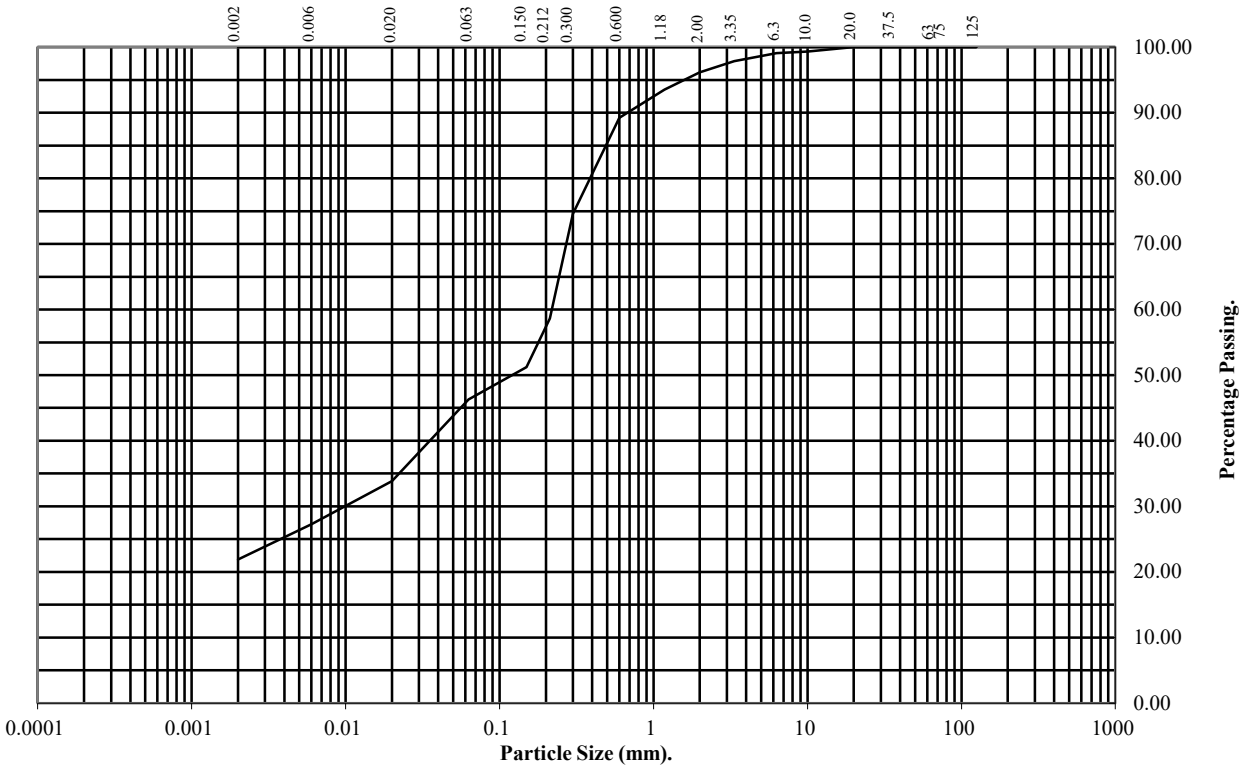
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: TP10 **Top Depth (m):** 0.85

Sample Number: **Base Depth(m):** 0.90

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	99
3.35	98
2	96
1.18	94
0.6	89
0.3	75
0.212	59
0.15	51
0.063	46

Particle Diameter	Percentage Passing
0.02	34
0.006	27
0.002	22

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	50
Silt	24
Clay	22

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Shanks Railway Sidings**	**Contract No:** PSL19/0986 **Client Ref:** 5112

ONE DIMENSIONAL CONSOLIDATION TEST

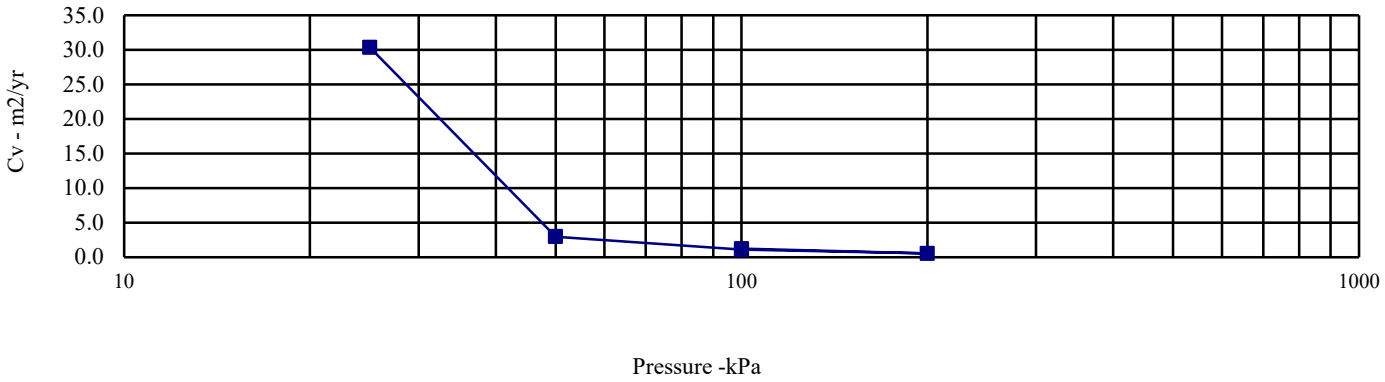
BS 1377: Part 5: 1990: Clause 3

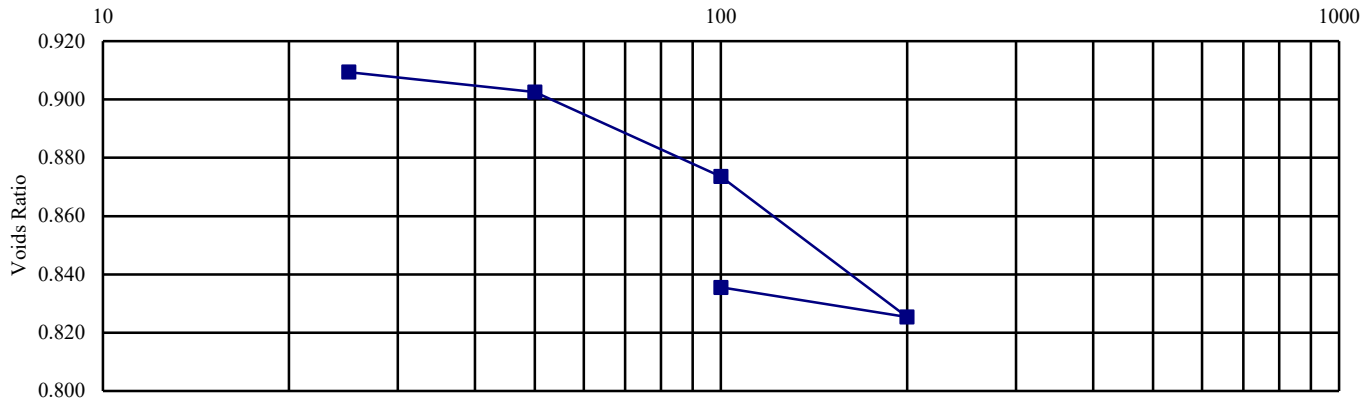
Hole Number: CP01 **Top Depth (m):** 2.00

Sample Number: **Base Depth (m) :** 2.50

Sample Type: U

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	32						
Bulk Density (Mg/m3):	1.82	0	25	0.309	30.350	Method used to determine CV:	T90
Dry Density (Mg/m3):	1.38	25	50	0.143	2.956		
Voids Ratio:	0.924	50	100	0.304	1.085	Nominal temperature during test ' C:	20
Degree of saturation:	91.6	100	200	0.257	0.544		
Height (mm):	19.954	200	100	0.055	1.220	Remarks: See summary of soil descriptions	
Diameter (mm)	75.03						
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0986
			Client Ref: 5112

ONE DIMENSIONAL CONSOLIDATION TEST

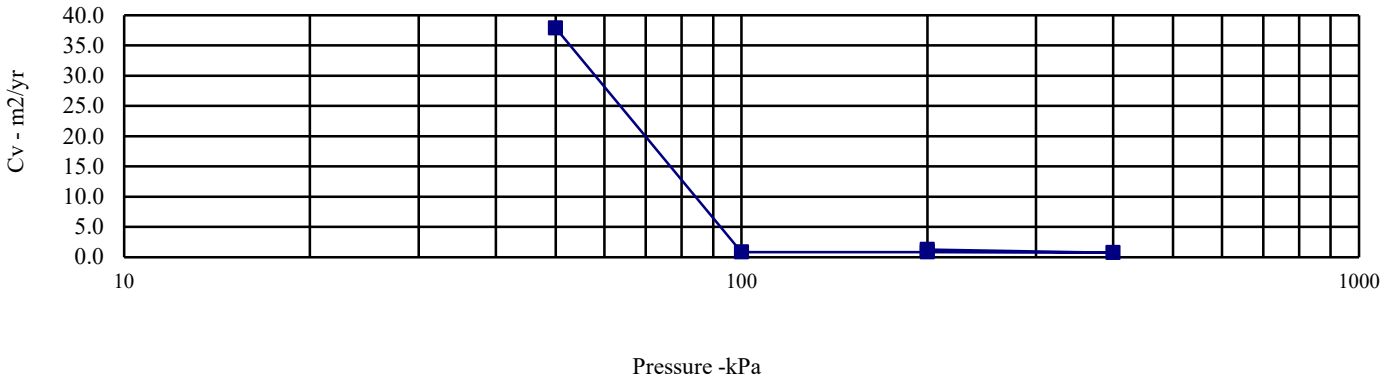
BS 1377: Part 5: 1990: Clause 3

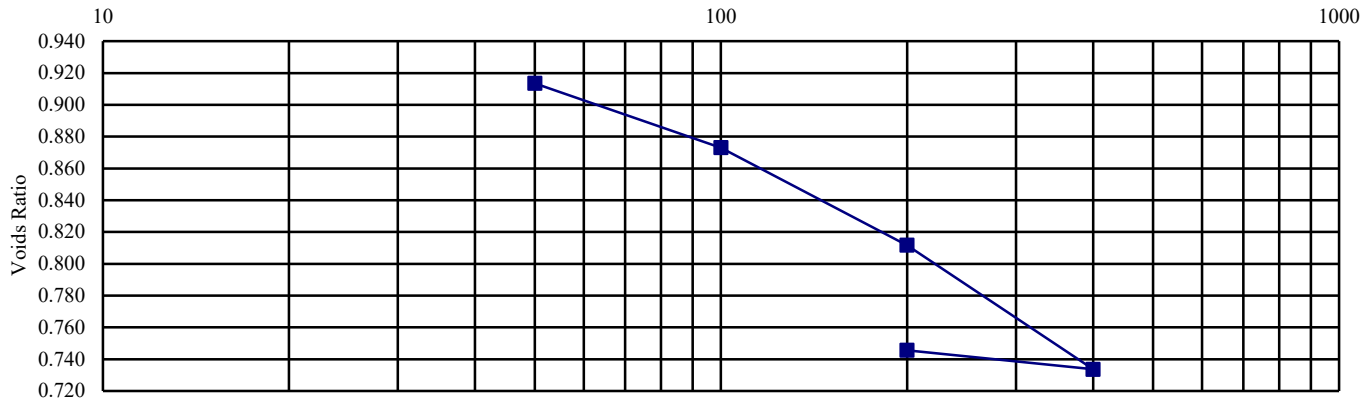
Hole Number: CP02 **Top Depth (m):** 4.00

Sample Number: **Base Depth (m) :** 4.50

Sample Type: U

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	35						
Bulk Density (Mg/m3):	1.82	0	50	0.542	37.875	Method used to determine CV:	T90
Dry Density (Mg/m3):	1.35	50	100	0.423	0.855		
Voids Ratio:	0.967	100	200	0.328	0.839	Nominal temperature during test ' C:	20
Degree of saturation:	96.6	200	400	0.215	0.747		
Height (mm):	19.8	400	200	0.035	1.276	Remarks: See summary of soil descriptions	
Diameter (mm)	75.045						
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0986
			Client Ref: 5112

ONE DIMENSIONAL CONSOLIDATION TEST

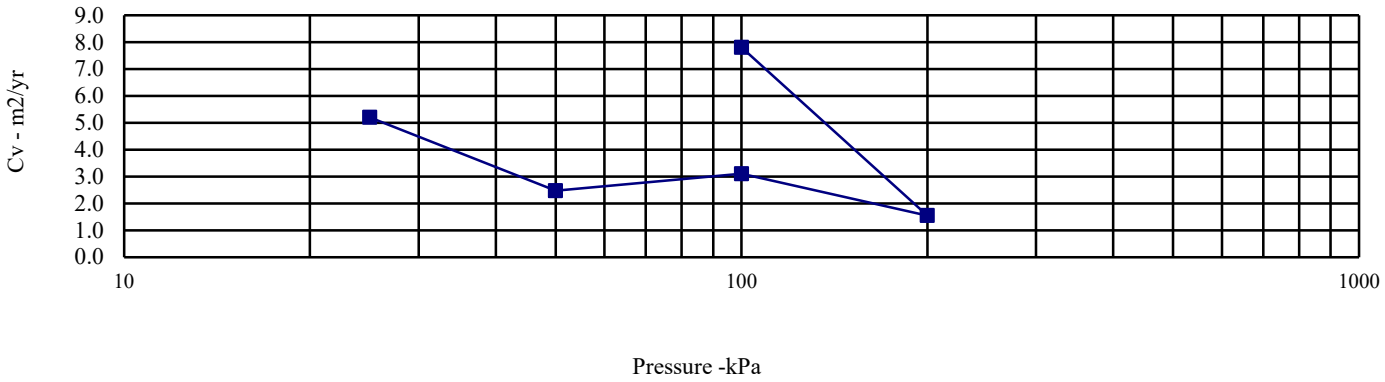
BS 1377: Part 5: 1990: Clause 3

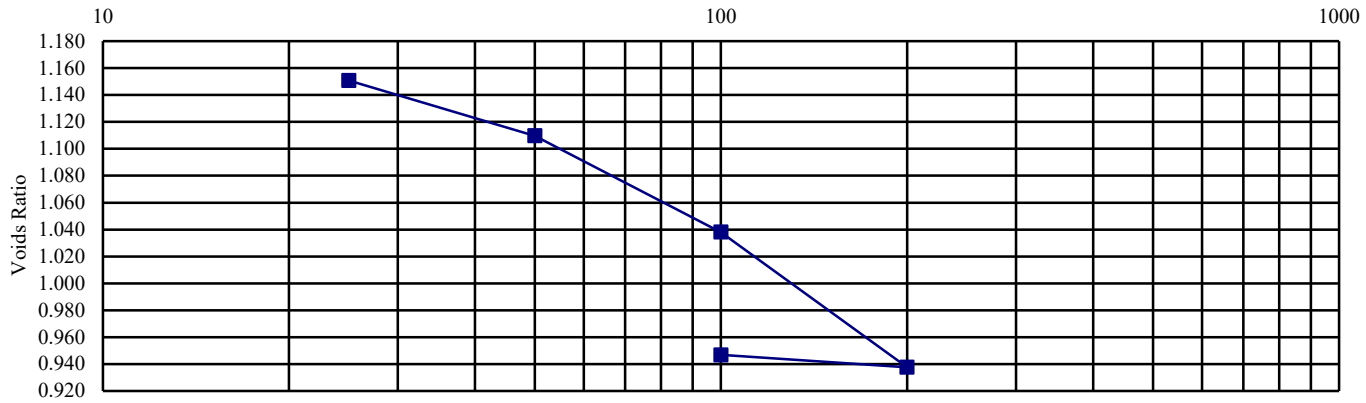
Hole Number: CP03 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m) :** 1.50

Sample Type: U

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	41						
Bulk Density (Mg/m3):	1.70	0	25	0.905	5.203	Method used to determine CV:	T90
Dry Density (Mg/m3):	1.20	25	50	0.762	2.470		
Voids Ratio:	1.201	50	100	0.679	3.102	Nominal temperature during test ' C:	20
Degree of saturation:	90.4	100	200	0.493	1.550		
Height (mm):	19.174	200	100	0.047	7.805	Remarks: See summary of soil descriptions	
Diameter (mm)	75.033						
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0986
			Client Ref: 5112

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

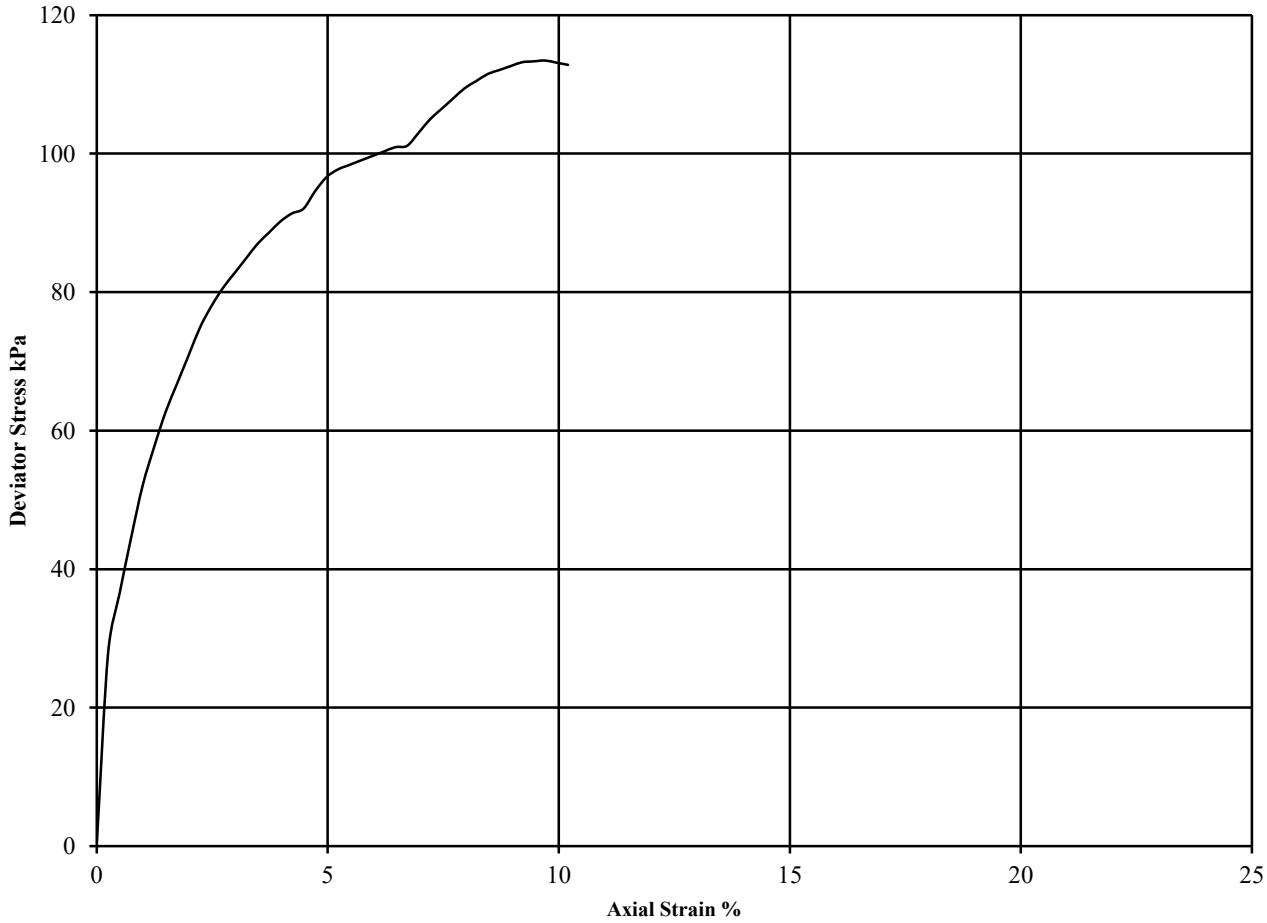
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number: CP01 **Top Depth (m):** 2.00

Sample Number: **Base Depth (m):** 2.50

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa)
1	33	1.86	1.40	25	92	46	4.5		0.36 0.36 0.35
				50	101	51	6.7		See summary of soil descriptions
				100	113	57	9.7	Plastic	

UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0986 Client Ref: 5112

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

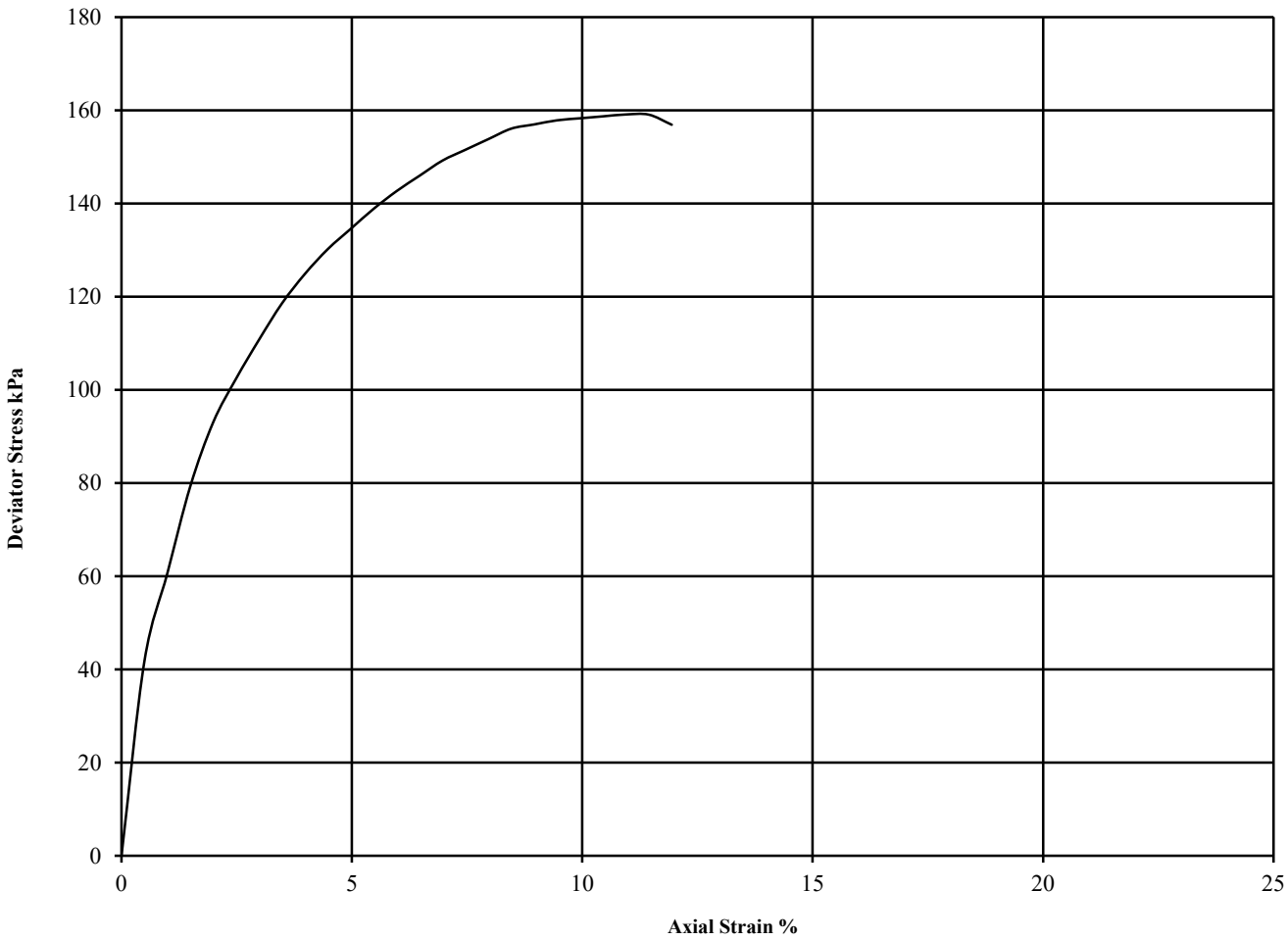
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: CP02 **Top Depth (m):** 2.00

Sample Number: **Base Depth (m):** 2.50

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.35
1	31	1.91	1.46	50	159	80	10.9	Brittle	See summary of soil descriptions

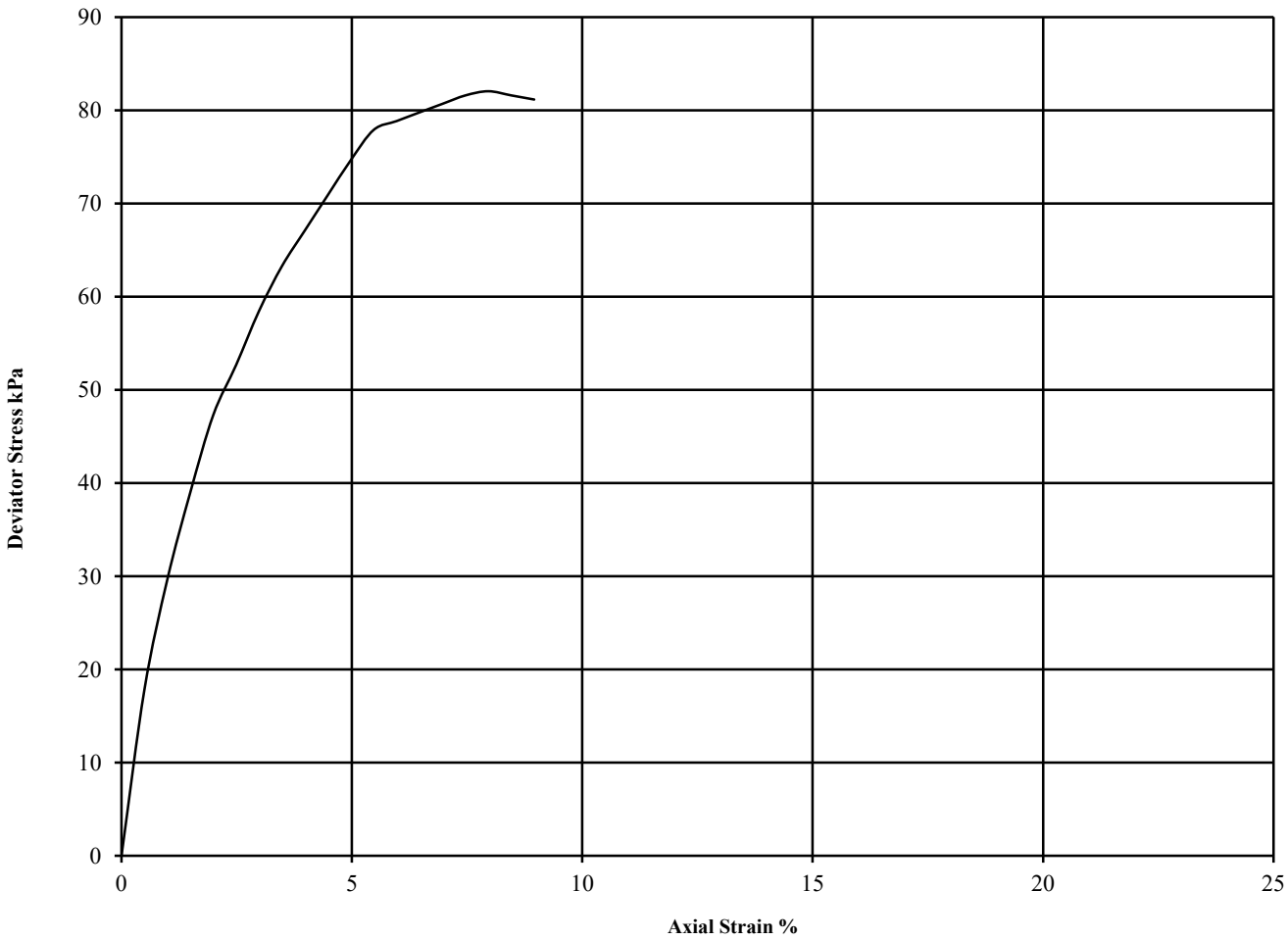
UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0986 Client Ref: 5112

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**CP02**	**Top Depth (m):**	**4.00**
Sample Number:		**Base Depth (m):**	**4.50**
Sample Type	**U**		



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.35
1	35	1.81	1.34	100	82	41	8.0	Brittle	See summary of soil descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Shanks Railway Sidings**	**Contract No:** PSL19/0986 **Client Ref:** 5112

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

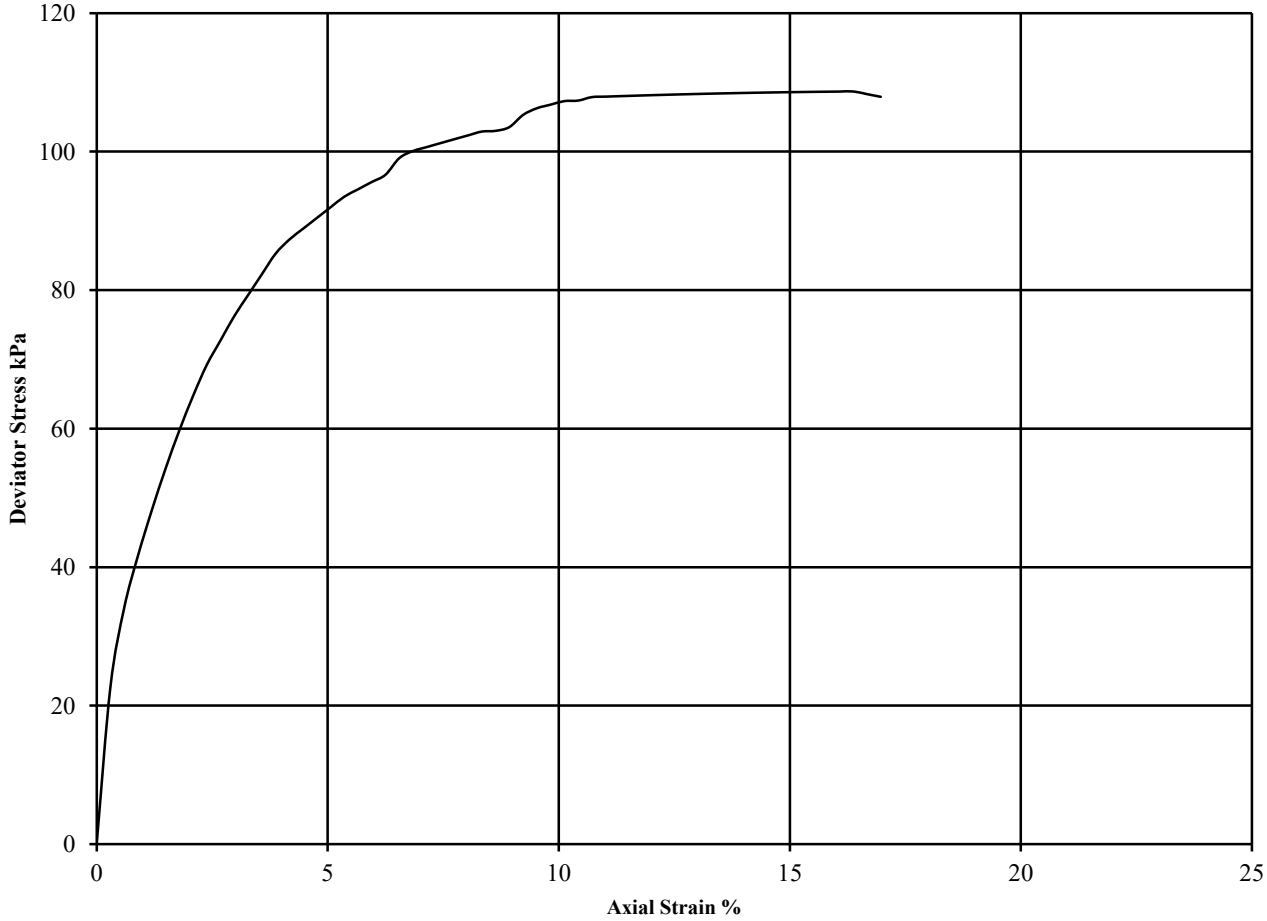
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number: CP03 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):** 1.50

Sample Type U



Diameter (mm):		103	Height (mm):		173	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa)
1	41	1.75	1.24	25	97	48	6.3		0.36 0.35 0.34
				50	104	52	8.9		See summary of soil descriptions
				100	109	54	16.4	Plastic	

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Shanks Railway Sidings**	**Contract No:** PSL19/0986 **Client Ref:** 5112

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

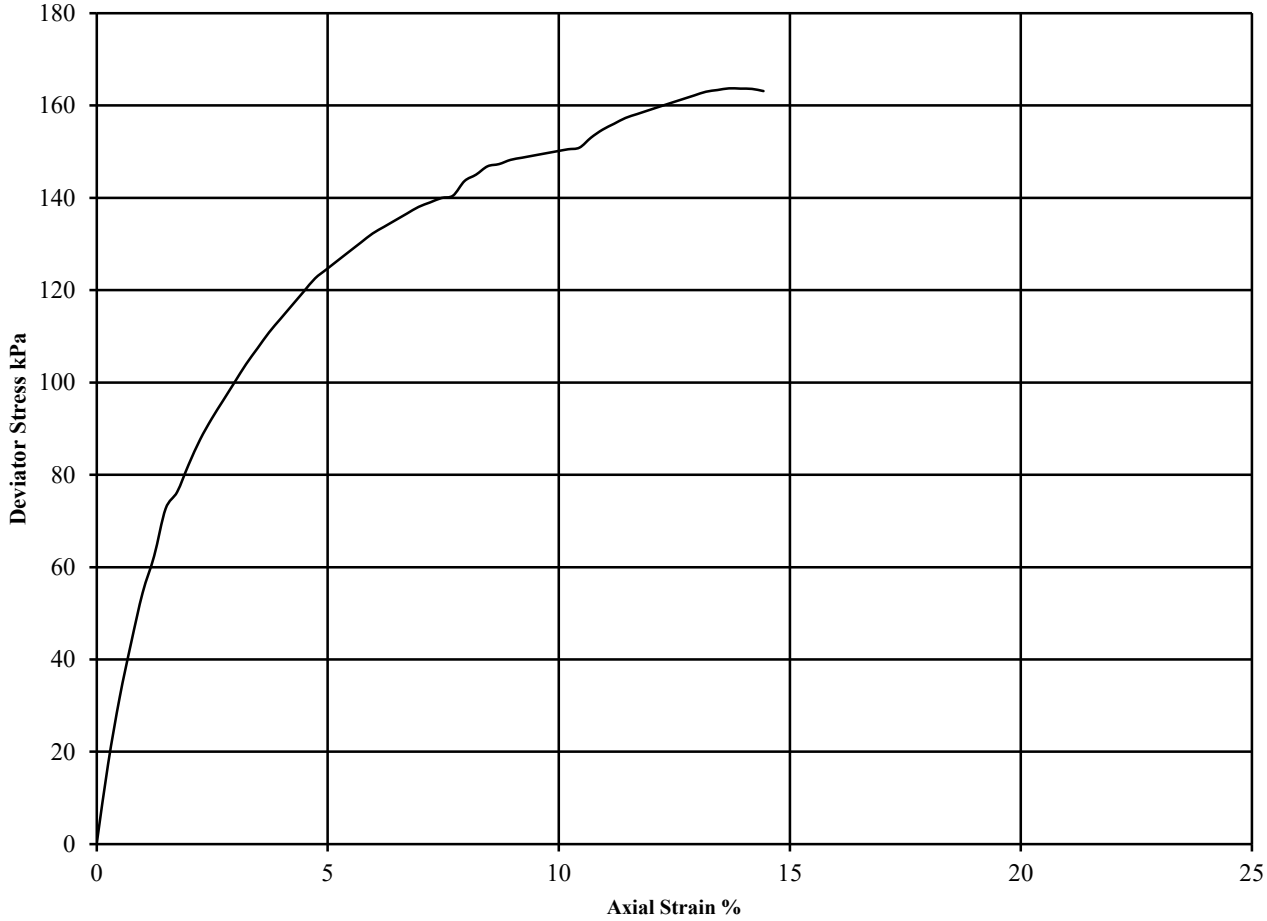
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number: CP03 **Top Depth (m):** 4.00

Sample Number: **Base Depth (m):** 4.50

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa)
1	31	1.88	1.43	50	140	70	7.7		0.35 0.35 0.34
				100	151	75	10.2		See summary of soil descriptions
				200	164	82	13.7	Brittle	

UKAS TESTING 4043	PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No: PSL19/0986 Client Ref: 5112

SUMMARY OF LABORATORY HAND VANES

(BS1377 : PART 9 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Peak Shear Strength kPa	Residual Shear Strength kPa	Remarks
CP01		U	2.00	2.50	33	43		
CP02		U	2.00	2.50	31	70		
CP02		U	4.00	4.50	35	41		
CP03		U	1.00	1.50	41	56		
CP03		U	4.00	4.50	31	80		

* This test is out of our UKAS scope

PSL Professional Soils Laboratory	Shanks Railway Sidings	Contract No:
		PSL19/0986
		Client Ref:
		5112

Certificate of Analysis

Certificate Number 19-03170-1

01-Mar-19

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 19-03170-1

Client Reference PSL19/0986

Order No (not supplied)

Contract Title 5112 Shanks Railway Sidings

Description 13 Soil samples.

Date Received 19-Feb-19

Date Started 19-Feb-19

Date Completed 01-Mar-19

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

Notes This test supersedes 19-03170, extra testing.
Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 19-03170-1
Client Ref PSL19/0986
Contract Title 5112 Shanks Railway Sidings

			Lab No	1462684	1462685	1462686	1462687	1462688	1462689	1462690	1462691	1462692	1462693	1462694
			Sample ID	TP01	TP01	TP03	TP03	TP04	TP04	TP06	TP06	TP07	TP07	TP09
			Depth	1.50-1.90	2.50-2.80	0.70-0.90	1.65-1.75	1.00-1.40	0.40-0.60	2.50-2.70	1.80-2.00	0.50-0.70	1.55-1.75	0.30-0.50
			Other ID											
			Sample Type	D	D	D	D	D	D	D	D	D	D	D
			Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**											
Inorganics														
pH	DETSC 2008#			8.0		7.5		7.8		7.9		7.8		8.1
Calorific Value	DETSC 5008	1	MJ/kg			16.0			11.6					< 1.0
Organic matter	DETSC 2002#	0.1	%	0.5	3.4	18	1.9	2.7	8.3	9.6	8.2	1.1	8.2	2.1
Chloride Aqueous Extract	DETSC 2055	1	mg/l	12		29		76		87		16		7.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	200		450		2000		850		1800		1800
Sulphur as S, Total	DETSC 2320	0.01	%	0.03		0.09		1.1		1.1		0.82		0.54
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07		0.15		3.8		0.24		2.4		1.4

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 19-03170-1
Client Ref PSL19/0986
Contract Title 5112 Shanks Railway Sidings

			Lab No	1462695	1462696
			Sample ID	TP10	TP08
			Depth	0.85-0.90	2.20-3.95
			Other ID		
			Sample Type	D	B
			Sampling Date	n/s	n/s
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Inorganics					
pH	DETSC 2008#			8.5	7.9
Calorific Value	DETSC 5008	1	MJ/kg		
Organic matter	DETSC 2002#	0.1	%	0.4	8.7
Chloride Aqueous Extract	DETSC 2055	1	mg/l	3.0	40
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	59	670
Sulphur as S, Total	DETSC 2320	0.01	%	0.04	1.7
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.06	0.18

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 19-03170-1
Client Ref PSL19/0986
Contract 5112 Shanks Railway Sidings

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1462684	TP01 1.50-1.90 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
1462685	TP01 2.50-2.80 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1462686	TP03 0.70-0.90 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Calorific Value (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
1462687	TP03 1.65-1.75 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1462688	TP04 1.00-1.40 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
1462689	TP04 0.40-0.60 SOIL		PT 1L	Sample date not supplied, Calorific Value (365 days), Organic Matter (Manual) (28 days)	
1462690	TP06 2.50-2.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
1462691	TP06 1.80-2.00 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1462692	TP07 0.50-0.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
1462693	TP07 1.55-1.75 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1462694	TP09 0.30-0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Calorific Value (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
1462695	TP10 0.85-0.90 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	

Information in Support of the Analytical Results

Our Ref 19-03170-1
Client Ref PSL19/0986
Contract 5112 Shanks Railway Sidings

1462696	TP08 2.20-3.95 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	

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

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

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

Appendix H Groundwater and Ground Gas Monitoring

GAS AND GROUNDWATER MONITORING RESULTS

Site: Former Shanks Railway Sidings

Job No: 5112 **Client:** Cloud Wing (UK) Limited

Visit No: 1 **Date:** 19th Feburary 2019

CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP01	0.0	0.0	1.8	0.0	0.0	0.9	0	1	18.6	0.0	0.0	0.895	6.050
CP02	0.0	0.0	5.4	0.0	0.0	0.1	0	1	16.0	0.1	0.1	0.995	6.130
CP03	0.0	0.0	4.9	0.0	0.0	3.8	0	1	14.3	-0.1	0	1.010	1.325

Ambient Concentration (% volume): **CH_4** 0.0 %v/v **CO_2** 0.1 %v/v **O_2** 20.7 %v/v

Barometric Pressure: **Start** 1016 **Monitoring Equipment:** GA5000

End 1016 **Serial Number of Equipment:** G505491

Barometric Pressure Trend: Rising. **Date of Last Calibration:** 16.November.2018

Weather: Bright, Slight Breeze, Dry. **Operator:** MHP (JPG)

Key	Remarks
NR - Not Recorded NA - Not Applicable	
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Former Shanks Railway Sidings
Job No: 5112 **Client:** Cloud Wing (UK) Limited
Visit No: 2 **Date:** 1st March 2019

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP01	0.0	0.0	1.9	0.0	0.0	1.7	0.0	0.0	19.3	0.1	0.1	0.850	6.120
CP02	0.0	0.0	1.2	0.0	0.0	1.2	0.0	0.0	20.6	8.9	8.9	1.290	6.140
CP03	0.0	0.0	6.5	0.0	0.0	6.5	0.0	0.0	11.6	0	0	1.200	1.330

Ambient Concentration (% volume): **CH_4** 0.0 %v/v **CO_2** 0.1 %v/v
O_2 20.9 %v/v

Barometric Pressure: **Start** 1017
End 1017
Barometric Pressure Trend: Falling.
Weather: Dry, Light Wind, Cloudy.

Monitoring Equipment: GA5000
Serial Number of Equipment: GA501518
Date of Last Calibration: 03.January.2019
Operator: W.M (enitial)

Key	Remarks
NR - Not Recorded NA - Not Applicable	
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Former Shanks Railway Sidings
Job No: 5112 **Client:** Cloud Wing (UK) Limited
Visit No: 3 **Date:** 6th March 2019

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP01	0.0	0.0	1.6	0.0	0.0	1.5	0.0	0.0	20.0	-0.2	-0.2	0.86	6.000
CP02	0.0	0.0	4.9	0.0	0.0	4.7	0.0	0.0	18.6	-0.2	-0.2	1.07	6.060
CP03	0.0	0.0	6.5	0.0	0.0	6.5	0.0	0.0	16.5	0.1	0.1	1.07	0.910

Ambient Concentration (% volume): **CH_4** 0.0 %v/v **CO_2** 0.0 %v/v
O_2 20.9 %v/v

Barometric Pressure: **Start** 985
End 985
Barometric Pressure Trend: Falling.
Weather: Wet, Moderate Wind, Cloudy.

Monitoring Equipment: GA5000
Serial Number of Equipment: GA501518
Date of Last Calibration: 03.January.2019
Operator: W.M (enitial)

Key	Remarks
NR - Not Recorded NA - Not Applicable	
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Former Shanks Railway Sidings
Job No: 5112 **Client:** Cloud Wing (UK) Limited
Visit No: 4 **Date:** 15th March 2019

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP01	0.0	0.0	1.6	0.0	0.0	1.5	0.0	0.0	20.0	-0.2	-0.2	0.76	6.000
CP02	0.0	0.0	4.9	0.0	0.0	4.7	0.0	0.0	18.6	-0.2	-0.2	1.02	6.060
CP03	0.0	0.0	6.5	0.0	0.0	6.5	0.0	0.0	16.5	0.1	0.1	0.71	0.910

Ambient Concentration (% volume): **CH_4** 0.0 %v/v **CO_2** 0.0 %v/v
O_2 20.8 %v/v

Barometric Pressure: **Start** 1001
End 1001
Barometric Pressure Trend: Falling.
Weather: Moist, Windy, Overcast.

Monitoring Equipment: GA5000
Serial Number of Equipment: GA501518
Date of Last Calibration: 03.January.2019
Operator: A.G (enitial)

Key	Remarks
NR - Not Recorded NA - Not Applicable	
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Former Shanks Railway Sidings

Job No: 5112 **Client:** Cloud Wing (UK) Limited

Visit No: 5 **Date:** 21st March 2019

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP01	0.0	0.0	1.5	0.0	0.0	1.5	0.0	0.0	19.9	0.0	0.0	0.780	6.120
CP02	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	19.8	5.1	5.1	0.790	6.150
CP03	0.0	0.0	6.5	0.0	0.0	6.5	0.0	0.0	15.0	0.2	0.2	1.150	1.320

Ambient Concentration (% volume): **CH_4** 0.0 %v/v **CO_2** 0.1 %v/v **O_2** 20.9 %v/v

Barometric Pressure: **Start** 1031 **End** 1031

Barometric Pressure Trend: Steady.

Weather: Wet, Moderate, Cloudy.

Monitoring Equipment: GA5000

Serial Number of Equipment: GA501518

Date of Last Calibration: 03.January.2019

Operator: W.M (enitial)

Key	Remarks
NR - Not Recorded NA - Not Applicable	
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Former Shanks Railway Sidings
Job No: 5112 **Client:** Cloud Wing (UK) Limited
Visit No: 6 **Date:** 29th March 2019

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP01	0.0	0.0	0.9	0.0	0.0	0.8	0.0	0.0	19.4	0.0	0.0	0.850	6.120
CP02	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	20.1	0.2	0.2	1.020	6.150
CP03	0.0	0.0	6.1	0.0	0.0	6.1	0.0	0.0	13.8	0.1	0.1	1.200	1.320

Ambient Concentration (% volume): **CH_4** 0.0 20.9 **CO_2** 0.1 %v/v
O_2 %v/v

Barometric Pressure: **Start** 1029
End 1029
Barometric Pressure Trend: Steady
Weather: Dry, Light and slightly cloudy.

Monitoring Equipment: GA5000
Serial Number of Equipment: GA501518
Date of Last Calibration: 03.January.2019
Operator: W.M (enitial)

Key	Remarks
NR - Not Recorded NA - Not Applicable	Groundwater sample obtained from CP02 during the monitoring visit.
	Checked: **Approved:**

Appendix I Limitations

General

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

JPG (Leeds) 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) this document to any third party with whom an agreement has not been executed.

Phase I Desk Study Reports

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, JPG (Leeds) Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Geo-Environmental 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 allow a reasonable assessment of the environmental risks together with engineering and development implications. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

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 may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

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 of 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 that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather-related effects.

The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

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

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.

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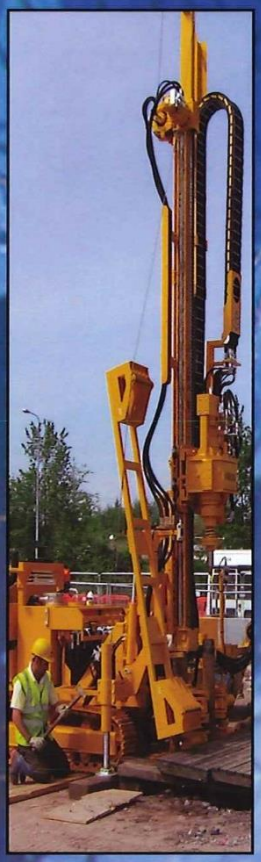
Appendix C – Phase 2 Ground Investigation Report


TerraConsult

JULY 2020

Report No 4329/01 Issue 2

Stewartby, Bedford

PHASE 2 GROUND INVESTIGATION REPORT

Carried out for: **FCC Environment**

Renewi PLC

Lead Consultant: **TerraConsult Ltd**

TerraConsult

Stewartby, Bedford

PHASE 2 GROUND INVESTIGATION REPORT

Date: JUNE 2020

Report No: 4329/01 Issue 2

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DOCUMENT INFORMATION AND CONTROL SHEET

Document Status and Approval Schedule

Report No.	Title
4329/01	**Stewartby, Bedford** **PHASE 2 GROUND INVESTIGATION REPORT**

Issue History

	Status	Date	Contributors	Signature	Date
	DRAFT	**12/06/20**	**Prepared By:** Hannah Hadwin BSc (Hons) MSc FGS	**H. Hadwin**	**12/06/2020**
			Checked and approved By: Brad Hall BSc (Hons) FGS PIEMA MIEnvSc	**B Hall**	**14/06/2020**
	FINAL	**26/06/2020**	**Amended and Approved By:** Brad Hall BSc (Hons) FGS PIEMA MIEnvSc	**B Hall**	**26/06/2020**
	FINAL – Updated with summary table of chemical analysis	**10/07/2020**	**Amended By:** Mark Wilson BSc (Hons) FGS	**M. Wilson**	**10/07/2020**
			Approved By: Brad Hall BSc (Hons) FGS PIEMA MIEnvSc	**B Hall**	**10/07/2020**

DISCLAIMER

This report should be read with the Service Constraints, Report Limitations & Planning Requirements set out in Appendix D.

FS573193 EMS573194

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FIGURE

TABLES

APPENDICES

1 INTRODUCTION

1.1 Appointment

TerraConsult (TCL) were commissioned by FCC Environment and Renewi PLC to undertake a Phase 2 Assessment to determine the current condition of clay mineral reserves directly beneath the Stewartby Sidings site in Stewartby, Bedford.

1.2 Objectives

The objectives of this report are to assess the following:

- The prevailing ground conditions at the site;
- The potential presence and extent of contamination in shallow soil;
- The significance and magnitude of the observed contamination to be assessed through comparison of laboratory testing data to appropriate published environmental screening criteria;

1.3 Reliability of information

This report should be read in its entirety, including all associated drawings and appendices. TCL cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context. The findings and opinions conveyed in this report are based on information obtained from a variety of sources as detailed within this report and which TCL believes is reliable. All reasonable care and skill has been applied in examining the information obtained, nevertheless, TCL cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

This report presents the factual data obtained from the current programme of fieldwork, monitoring and laboratory testing, together with an assessment of near surface soils and general engineering considerations for the proposed development scheme.

Any recommendations made or opinions expressed in the report are based on the exploratory hole records, an examination of samples and the results of the site and laboratory tests. No liability can be accepted for conditions not revealed by the exploratory holes, particularly between positions. Whilst every effort is made to ensure accuracy of data supplied any opinion expressed as to the possible configuration of strata between or below investigation locations is for guidance only and no responsibility is accepted as to its accuracy.

The groundwater conditions entered on the borehole records and from any monitoring programme are those observed at the time of the investigation. Groundwater levels are susceptible to seasonal fluctuations and may be higher during wetter periods than those encountered during this investigation.

Where the report refers to the potential presence of invasive plant species, such as Japanese Knotweed, or the presence of potential asbestos containing materials, it should be noted that the observations are for information purposes only and should be verified by a suitably qualified expert.

2 Site and Setting

2.1 Site Location

The site is located at Land off Stewartby, Bedford. National Grid coordinates (TL 018 431). Figure 1 below shows the site location.

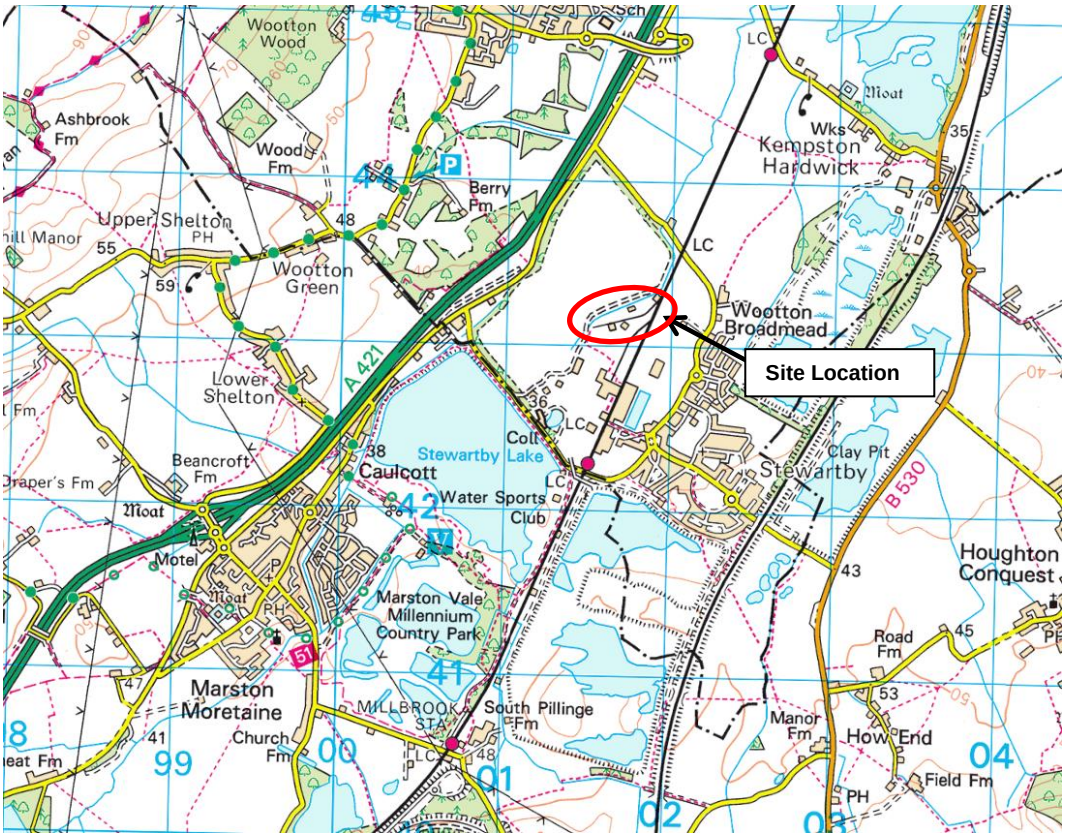

Figure 1 – Site Location Plan

2.2 Site Location and Description

The site is located 500 m north of Stewartby and was historically used as railway sidings. The site is approximately 2.9 hectares in area.

2.3 Geology

Information published by the BGS indicates that superficial deposits are absent beneath the site, however Glacial Till (Boulder Clay) and alluvium deposits are located in close proximity. The bedrock comprises mudstone of the Peterborough Member.

3 GROUND INVESTIGATION - METHODOLOGY

3.1 Scope of Works

A ground investigation was undertaken on the 11th and 12th May 2020 comprised the following scope of works. The rationale for the works, including laboratory testing is summarised in **Table 1**.

An exploratory hole location plan is presented in **Appendix A**. Exploratory hole records are presented in **Appendix B**.

The ground investigation works were carried out under full time supervision and in general accordance with BS5930:2015 'Code of Practice for Site Investigations' and BS10175:2011 (as amended) 'Investigation of Potentially Contaminated Sites'.

Table 1: Ground Investigation Rationale

Ground Investigation Task	Rationale
Twelve trial pits (TP01-TP12) to a maximum depth of 3.00m bgl.	Collect Soil Samples to assess contamination and observe shallow ground conditions.
Collection of environmental soil samples for subsequent testing at a UKAS and MCERTS accredited laboratory.	Enables classification for re-use on-site or off-site disposal
Laboratory Testing	**Rationale**
24 no. arsenic, boron, barium, beryllium, cadmium, chromium (III and VI), copper, lead, mercury, nickel, selenium, vanadium, zinc, sulphate, total, free and complex cyanide, pH, soil organic matter, total phenols, Polycyclic Aromatic Hydrocarbons (PAH) (speciated to US EPA priority 16), Total Petroleum Hydrocarbons (TPH), TPHCWG. 6 no. Chlorinated Hydrocarbons	Assess soil contamination from historical land use.
5 samples for asbestos screening	Assess potential soil contamination from ACM's found on-site.

4 GROUND INVESTIGATION - FINDINGS

4.1 Ground Conditions

The sequence encountered generally comprised of Made Ground, underlain by alluvium deposits subsequently underlain by Oxford Clay (Peterborough Member).

Made Ground

Made Ground was encountered within all trial pits (TP01 to TP12). The Made Ground is granular in nature.

The granular Made Ground is predominantly described as dark brown reddish brown grey sandy gravel and cobbles.

Anthropogenic fragments included railway ballast, brick, cinders, ash and clinker.

The base of the Made Ground was proven at depths in the range of 0.70m to 1.40mbgl.

Natural Ground

Natural ground was encountered directly beneath the Made Ground within all exploratory hole locations.

The natural material predominately comprised of firm to stiff blueish grey and mottled brown clay with shells. This material represents Oxford Clay.

Localised Alluvium deposits were noted within TP02 (0.70m to 2.20mbgl) and TP03 (0.90m to 1.90mbgl). These deposits comprised clay overlaying gravel. Field logging of the clay indicates consistencies of soft to firm.

The base of the Alluvium deposit was proved within TP02 and TP03 at depths of 1.90m and 2.20m respectively.

The base of the Oxford Clay has not been proven. All exploratory holes have been terminated at depths ranging between 1.80m and 2.80m bgl within the Oxford Clay.

TP01 was terminated at 1.60m bgl within Oxford Clay due to an obstruction.

4.2 Visual and Olfactory Evidence

No olfactory evidence of contamination was observed during the ground investigation.

4.3 Groundwater Strikes

Perched groundwater were observed in TP02 at 1.40m bgl, TP03 at 1.90m bgl, TP05 at 2.70m bgl, TP06 at 1.20m bgl, TP07 at 0.90m bgl, TP08 at 1.0m bgl and TP09 at 1.10m bgl.

5 HUMAN HEALTH RISK ASSESSMENT

5.1 Introduction

The UK approach to the assessment of contaminated land is based upon the principles of risk assessment, which is founded on the use of 'source-pathway-receptor' principles in order to establish the potential presence of 'pollutant linkage'.

TCL adopts a tiered approach to risk assessment in accordance with current UK guidance and good practice. The initial step of this process, known as Tier 1 or Generic Quantitative Risk Assessment (GQRA), is the comparison of site-derived data with relevant guideline levels.

Should the adopted criteria be exceeded, then two courses of action are available. The first is to break the pollutant linkage by undertaking remedial works such as removing or treating the contaminated soil. Alternatively, a more detailed risk assessment (DQRA) can be carried out to determine whether a contamination risk actually exists.

The UK approach to the assessment of human health risk from contaminated land is set out in the CLEA (Contaminated Land Exposure Assessment) framework, which was first published in 2002 by the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA). The original guidance was withdrawn and revised guidance issued in 2009, which is set out in the following documents published by the EA:

'Human Health Toxicological Assessment of Contaminants in Soil', Science Report SC050021/SR2; and

'Updated Technical Background to the CLEA Model', Science Report SC050021/SR3.

The CLEA model uses generic assumptions about the fate and transport of chemicals in the environment and a generic conceptual model for site conditions together with human behaviour to estimate long term human exposure to soil contaminants. Soil Guideline Values (SGV) were previously derived using the CLEA Model by comparing estimated exposure with 'Health Criteria Values' (HCV) that represent a tolerable risk to health from chronic exposure.

The CLEA model has also been used to determine other generic assessment criteria (GACs), including those used within this assessment.

5.2 Assessment Criteria

Relevant guidance issued by the Chartered Institute of Environmental Health (CIEH), in association with LQM, published November 2015 has been adopted. For arsenic, cadmium, chromium (hexavalent), lead and PAH benzo(a)pyrene, revised C4SL values have been used in conjunction with the methodology outlined in the SP1010 Final Project Report (Revision 2) by DEFRA (2014). The assessment criteria used for the screening of contaminants is summarised in **Table 2.**

Table 2: Summary of the Assessment Criteria for the Ground Investigation

Contaminant Group	Determinand	Assessment Criteria Selected
Organic Contaminants		
Non-halogenated hydrocarbons	Phenols TPH TPHCWG	GAC for aliphatic and aromatic carbon bandings derived by LQM/CIEH using CLEA V1.06
Polycyclic Aromatic Hydrocarbons (PAH); indicator compounds have been selected	PAH (non-genotoxic)	GAC derived by LQM/CIEH using CLEA V1.06. Ref: S4UL3633
	PAH (genotoxic) excluding benzo(a)pyrene	
	Benzo(a)pyrene	C4SL - SP1010 (2014)/ Benzo(a)pyrene is a surrogate marker for the eight genotoxic PAHs However, the LQM/CIEH S4ULs have been used to assess the genotoxic PAHs in the first instance.
Inorganic Contaminants		
Metals, semi-metals and non-metals	Chromium III, copper, zinc, nickel, selenium	GAC derived by LQM/CIEH using CLEA V1.06. Ref: S4UL3633
	Arsenic, cadmium, chromium VI, lead	C4SL - SP1010 (2014)
	Mercury	GAC derived by LQM/CIEH using CLEA V1.06. Ref: S4UL3633
Inorganic compounds	Inorganic cyanide	GAC derived using TOX report for acute exposure

5.3 Risk Assessment Methodology

Based on the size and the homogeneous ground conditions recorded, the site has been considered as one averaging zone.

Laboratory testing results were directly compared to the adopted GAC for commercial end-use, and results are shown in full in **Appendix C.** A summary of chemical analysis is presented in **Table 3** below.

Table 3 : Summary of Chemical Analysis for the Ground Investigation

Analyte	No. of Tests	Limit of Detection (LoD)	Minimum Concentration Detected	Maximum Concentration Detected
Stone Content	24	0.1%	No detections above LoD	
Asbestos	6	N/A	No detections of asbestos	
Metals				
Arsenic (total)	24	<1 mg/kg	4	30
Boron (water soluble)		<0.2 mg/kg	1	9
Cadmium (total)		<0.2 mg/kg	<LoD	1
Chromium (hexavalent)		<4 mg/kg	No detections above LoD	
Chromium (total) (III for S4ULs)		<1 mg/kg	24	87
Copper (total)		<1 mg/kg	10	160
Lead (total)		<1 mg/kg	10	170
Mercury (total inorganic)		<0.3 mg/kg	<LoD	1
Nickel (total)		<1 mg/kg	20	64
Selenium (total)		<1 mg/kg	2	5
Zinc (total)		<1 mg/kg	48	280
Barium		<1 mg/kg	29	480
Beryllium		<0.6 mg/kg	1	7
Vanadium		<1 mg/kg	30	91

Inorganics				
pH Value	24	pH Units	6.8	10.6
Cyanide (total)		<1 mg/kg	No detections above LoD	
Cyanide (free)		<1 mg/kg	No detections above LoD	
Sulphate (2:1)		<0.00125 g/l	0.13	2
Sulphate (total)		<200 mg/kg	260.00	4700
Organics				
Soil Organic Matter	24	<0.1 %	0.8	11.00
Phenol (Total Monohydric)		<1 mg/kg	No detections above LoD	
PAH				
Naphthalene	24	<0.05 mg/kg	0.4	0.7
Acenaphthylene		<0.05 mg/kg	No detections above LoD	
Acenaphthene		<0.05 mg/kg	1.9	1.9
Fluorene		<0.05 mg/kg	2.6	2.6
Phenanthrene		<0.05 mg/kg	0.4	17.0
Anthracene		<0.05 mg/kg	0.3	2.6
Fluoranthene		<0.05 mg/kg	0.4	14.0
Pyrene		<0.05 mg/kg	0.4	11.0
Benz(a)anthracene		<0.05 mg/kg	0.3	5.0
Chrysene		<0.05 mg/kg	0.3	3.9
Benzo(b)fluoranthene		<0.05 mg/kg	0.3	3.2
Benzo(k)fluoranthene		<0.05 mg/kg	0.2	2.3
Benzo(a)pyrene		<0.05 mg/kg	0.2	2.9
Indeno(123cd)pyrene		<0.05 mg/kg	0.2	2.0
Dibenzo(ah)anthracene		<0.05 mg/kg	0.3	0.6
Benzo(ghi)perylene		<0.05 mg/kg	0.3	2.4
Total EPA-16 PAHs		<0.8 mg/kg	1.1	71.0
BTEX				
Benzene	24	<0.001 mg/kg	No detections above LoD	
Toluene		<0.001 mg/kg	No detections above LoD	
Ethyl Benzene		<0.001 mg/kg	No detections above LoD	
Xylene (o)		<0.001 mg/kg	No detections above LoD	
Xylene (m)		<0.001 mg/kg	No detections above LoD	
Xylene (p)		<0.001 mg/kg	No detections above LoD	
MTBE		<0.001 mg/kg	No detections above LoD	
Petroleum Hydrocarbons				
Aliphatic >C5 - C6	24	<0.001 mg/kg	No detections above LoD	
Aliphatic >C6 - C8		<0.001 mg/kg	No detections above LoD	
Aliphatic >C8 - C10		<0.001 mg/kg	No detections above LoD	
Aliphatic >C10 - C12		<1 mg/kg	No detections above LoD	
Aliphatic >C12 - C16		<2 mg/kg	No detections above LoD	
Aliphatic >C16 - C21		<8 mg/kg	No detections above LoD	
Aliphatic >C21 - C35		<8 mg/kg	30	100.0
Total Aliphatic >C5 - C35		<10 mg/kg	30	110.0
Aromatic C5 - C7		<0.001 mg/kg	No detections above LoD	
Aromatic C7 - C8		<0.001 mg/kg	No detections above LoD	
Aromatic >C8 - C10		<0.001 mg/kg	No detections above LoD	
Aromatic >C10 - C12		<1 mg/kg	No detections above LoD	
Aromatic >C12 - C16		<2 mg/kg	5	14.0
Aromatic >C16 - C21		<1 0mg/kg	10	47.0
Aromatic >C21 - C35		<10 mg/kg	11	55.0
Total Aromatic >C5 - C35		<10 mg/kg	16	110.0
Chlorinated Hydrocarbons				
Multiple compounds	6	< 0.001 mg/kg	No detections above LoD	

5.4 Risk Assessment

A total of 24 samples of soil were tested. None of the contaminants exceed the GAC criteria for commercial end use.

Five samples of Made Ground were laboratory screened for asbestos; no asbestos was identified.

On this basis it is considered that significant contamination risks to human health are not present and contamination of the underlying mineral reserves (clay) have not taken place.

5.5 Waste Classification

The results of the total concentrations from the chemical testing on soil samples have been assessed to determine whether or not they are hazardous in terms of waste classification.

An initial waste classification exercise of the Made Ground material analysed has been undertaken. The Made Ground is likely to be classified as either inert or non-hazardous.

As an alternative location for off-site disposal of inert and non-hazardous waste, there are a number of sites which have Environmental Permits for site Reclamation and can accept certain categories of inert and non-hazardous wastes. During the most recent ground investigation, no soil samples were submitted from the area for analysis of landfill WAC.

Note that the above assessment should only be seen as an initial guide. Defining the class of waste is carried out on the actual waste being disposed of and the destination landfill site will have the final decision on acceptability of the waste. Therefore, it is recommended that if soils are to be removed from the site, the appointed contractor should approach a landfill site with the available chemical data and seek a formal waste characterisation.

5.6 Aggressive Ground

The site has been assessed in accordance with BRE Guidance Special Digest 1 (2005) assuming mobile groundwater conditions due to permeable ‘artificial ground’ sands.

Based on laboratory test data, subsurface ground conditions within the natural ground appear to be consistent with ACEC Class AC-3, the Design Sulphate Class is DS-3.

6 Conclusions and recommendations

6.1 Geo-Environmental

The result of the chemical analysis and the risk assessment confirms no contamination has been recorded above the GAC values for commercial end-use. No asbestos was detected. On this basis there is no evidence to suggest the previous land use has contaminated the underlying clay deposit.

The results of the total concentrations from the chemical testing on soil samples have indicated overall the site is classified as non-hazardous.

Design Sulphate Class for concrete may be taken DS-3 with an ACEC class for the site of AC-1.

Based on the information available regarding the site, the potential for Statutory Authority action based on ‘significant pollution of controlled waters’ or ‘significant harm’ as defined by Part IIA of the Environmental Protection Act 1990 or the significant possibility of these occurring is considered to be Low following completion of appropriate remediation or mitigation.

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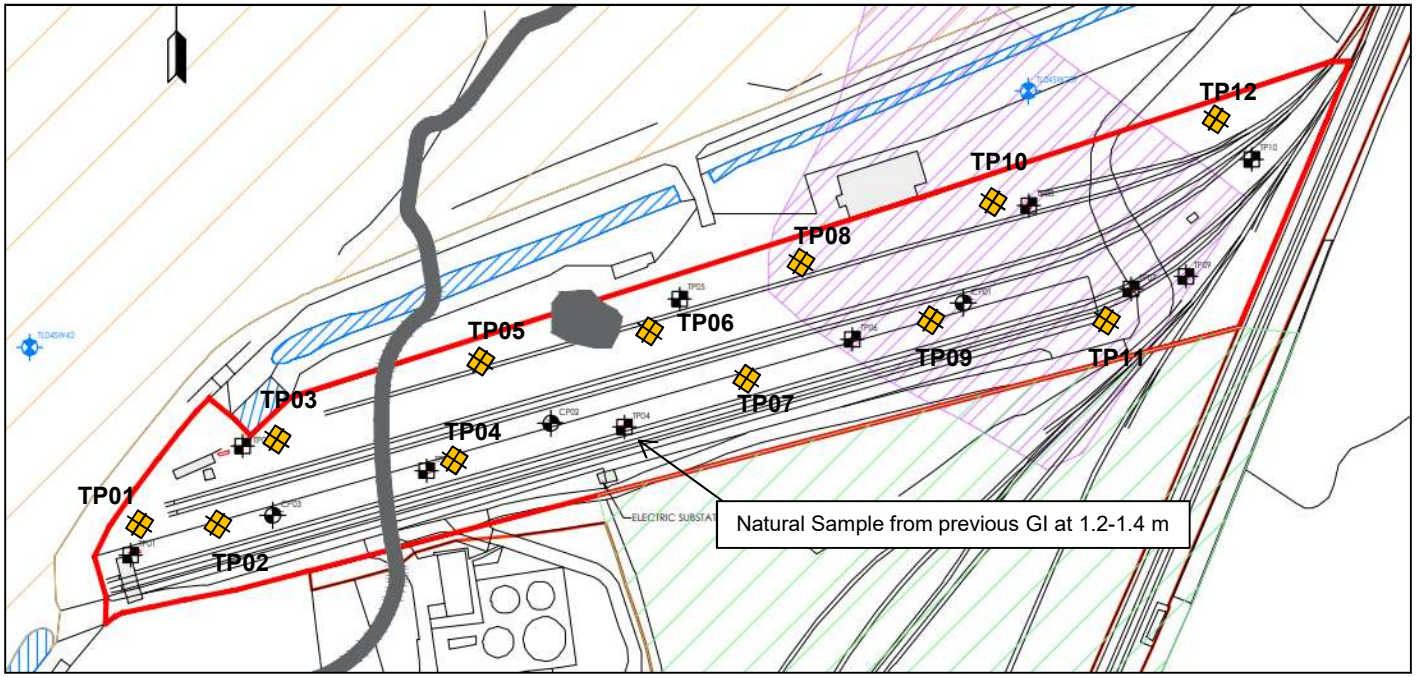
APPENDICES

APPENDIX A

Exploratory Hole Location Plan

Not to Scale



Key

Proposed Trial Pit location

4329-D001-1 – Exploratory Hole Location Plan	Drawn: M. Harper Date: March 20	Checked: Date:	Authorised: Date:	TerraConsult (Leeds) Ltd. Unit 15 (2) A3, Springfield Commercial Centre, Bagley Lane, Farsley, West Yorkshire, LS28 5LY
Client: FCC				**Project: Stewartby Sidings**

APPENDIX B

Exploratory Hole Logs

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	11/05/2020
Checked by:	DD			Length:		End:	11/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	11/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.90)	Dark brown and reddish brown sandy subangular GRAVEL and COBBLES comprising railway ballast and brick with some to much ash. Many large ashy pockets below 0.20 m with some clinker. (MADE GROUND) *0.20 - 0.90 m: Abundant large ashy pockets.*	0.50	D1	
			0.90 (0.70) 1.60	Firm bluish grey CLAY. (OXFORD CLAY)	1.50	D2	
				Trial pit ends at 1.60 m (Obstruction)			

Groundwater entries:			Depth related remarks:			General remarks:
Depth:	Rose to:	Remarks:	From	to:	Remarks:	Weather:
						Stability: Good
						Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: FINAL
Scale: 1:25

Project: Stewertby Sidings
Project No: 4329
Client: FCC Environment

Exploratory position reference:
TP01

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	11/05/2020
Checked by:	DD			Length:		End:	11/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	11/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.50) 0.50	Brown and grey sandy slightly silty subangular GRAVEL and COBBLES comprising ballast with some brick and occasional ash. (MADE GROUND)	0.40	D1	
			(0.40) 0.90	Dark grey sandy (ash) silty fine angular GRAVEL comprising of cinders with some clinker. (MADE GROUND)			
			(0.50) 1.40	Firm bluish grey CLAY. (ALLUVIUM)			
	▼		(0.50) 1.90	Orange brown sandy clayey GRAVEL comprising flint and chalk. (ALLUVIUM) *1.40 - 1.90 m: Water ingress.*			
			(0.90) 2.80	Firm to stiff dark bluish grey CLAY. Occasional to some white shell fragments. (OXFORD CLAY)	2.10	D2	
				Trial pit ends at 2.80 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:
1.40	1.40	Fast

Depth related remarks:

From	to:	Remarks:

General remarks:

Weather:

Stability: Good

Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP02

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	11/05/2020
Checked by:	DD			Length:		End:	11/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	11/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.70)	Brown sandy silty GRAVEL and COBBLES comprising subangular brick and concrete with some ballast and flint. (MADE GROUND)	0.50	D1	
			0.70 (1.10)	Firm to stiff bluish grey CLAY. Mild organic odour. (ALLUVIUM)			
	▼		1.80 (0.40)	Orangish brown sandy clayey GRAVEL comprising flint and chalk. (ALLUVIUM) *1.90 - 2.20 m: Water ingress.*			
			2.20 (0.50)	Stiff grey CLAY. Some to much white shell fragments. (OXFORD CLAY)	2.50	D2	
			2.70	Trial pit ends at 2.70 m (Target depth)			

Groundwater entries:			Depth related remarks:			General remarks:
Depth:	Rose to:	Remarks:	From	to:	Remarks:	Weather:
1.90	1.90	Fast				Stability: Good
						Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP03

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	11/05/2020
Checked by:	DD			Length:		End:	11/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	11/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.80)	Brown gravelly silty slightly clayey SAND with some ballast and brick. Occasional wood fragments. (MADE GROUND)			
			0.80 (0.50)	Dark grey and brown sandy (ash) subangular fine to medium GRAVEL comprising cinders and clinker. (MADE GROUND)	1.00	D1	
			1.30 (1.20)	Firm bluish grey CLAY. Occasional to some white shell fragments. (OXFORD CLAY)	2.00	D2	
			2.50	Trial pit ends at 2.50 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:

Depth related remarks:

From	to:	Remarks:

General remarks:
Weather:
Stability: Good
Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: FINAL
Scale: 1:25

Project: Stewertby Sidings
Project No: 4329
Client: FCC Environment

Exploratory position reference:
TP04

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	11/05/2020
Checked by:	DD			Length:		End:	11/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	11/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(1.20)	Brown and grey sandy subangular GRAVEL and COBBLES comprising ballast. (MADE GROUND)	1.00	D1	
			1.20	*1.10 - 1.20 m: Perched water encountered.*			
			(1.50)	Firm grey CLAY. Occasional gravel size dark grey pockets. Mild organic odour. (OXFORD CLAY)	2.00	D2	
			2.70	Trial pit ends at 2.70 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:

Depth related remarks:

From	to:	Remarks:

General remarks:

Weather:

Stability: Good

Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP05

Sheet 1 of 1

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	12/05/2020
Checked by:	DD			Length:		End:	12/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	12/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(1.10)	Dark brown silty sandy subangular gravel and cobbles comprising ballast with occasional brick fragments. (MADE GROUND)			
			1.10	Dark grey sandy (ash) silty subangular fine to medium GRAVEL comprising cinders with some brick cobbles. (MADE GROUND)	1.10	D1	
			1.20	Reddish brown silty subangular GRAVEL and COBBLES comprising brick fragments and shale. (MADE GROUND) *1.20 m: Perched water encountered.*			
			1.40	Soft locally firm bluish grey mottled grey CLAY. Mild organic odour. (OXFORD CLAY)			
			(0.30)	Firm bluish grey mottled grey CLAY. (OXFORD CLAY)	1.80	D2	
			1.70				
			(0.30)				
			2.00	Trial pit ends at 2.00 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:

Depth related remarks:

From	to:	Remarks:

General remarks:

Weather:

Stability: Good

Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP06

Sheet 1 of 1

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	12/05/2020
Checked by:	DD			Length:		End:	12/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	12/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.50)	Brown and reddish brown sandy silty subangular GRAVEL and COBBLES comprising brick fragments and some ballast. (MADE GROUND)			
			0.50	Dark grey sandy subangular fine to medium GRAVEL comprising ash and clinker. (MADE GROUND)			
			0.70	Reddish brown sandy silty subangular GRAVEL and COBBLES comprising brick and shale and some ballast. (MADE GROUND)			
			(0.40)	*0.90 - 1.10 m: Perched water encountered.*	0.90	D1	
			1.10	Firm bluish grey mottled brown CLAY. Occasional brown fine to medium sandy pockets. Occasional white shell fragments. (OXFORD CLAY)			
			(0.70)		1.50	D2	
			1.80	Trial pit ends at 1.80 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:

Depth related remarks:

From	to:	Remarks:

General remarks:

Weather:

Stability: Good

Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP07

Sheet 1 of 1

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	12/05/2020
Checked by:	DD			Length:		End:	12/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	12/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.50)	Dark brown and grey sandy silty subangular GRAVEL and COBBLES comprising ballast and occasional brick fragments. (MADE GROUND)			
			0.50 (0.40)	Brown and redish brown sandy slightly clayey GRAVEL and COBBLES comprising brick fragments and occasional ballast and ash. (MADE GROUND)			
			0.90 (0.40)	Reddish brown sandy subangular GRAVEL comprising brick, shale and occasional ash and slag. (MADE GROUND) *1.00 - 1.30 m: Perched water encountered.*	1.10	D1	
			1.30 (0.30)	Firm bluish grey and mottled brown CLAY. Occasional white shell fragments. (OXFORD CLAY)	1.50	D2	
			1.60	Trial pit ends at 1.60 m (Target depth)			

Groundwater entries:			Depth related remarks:			General remarks:
Depth:	Rose to:	Remarks:	From	to:	Remarks:	Weather:
						Stability: Good
						Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: FINAL
Scale: 1:25

Project: Stewertby Sidings
Project No: 4329
Client: FCC Environment

Exploratory position reference:
TP08

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	11/05/2020
Checked by:	DD			Length:		End:	11/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	11/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.40)	Light and dark brown sandy slightly clayey GRAVEL and COBBLES comprising subangular brick fragments, ballast and ash. (MADE GROUND)			
			0.40 (0.40)	Dark grey sandy (ash) silty subangular fine to medium GRAVEL comprising cinders and clinker. (MADE GROUND)			
			0.80 (0.30)	Reddish brown subangular GRAVEL comprising brick fragments and shale. (MADE GROUND)	1.00	D1	
			1.10 (0.70)	Firm bluish grey CLAY. (OXFORD CLAY) *1.10 m: Perched water encountered.*	1.50	D2	
			1.80	Trial pit ends at 1.80 m (Target depth)			

Groundwater entries:			Depth related remarks:			General remarks:
Depth:	Rose to:	Remarks:	From	to:	Remarks:	Weather:
						Stability: Good
						Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP09

Sheet 1 of 1

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	12/05/2020
Checked by:	DD			Length:		End:	12/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	12/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.70)	Dark brown and grey sandy silty subangular GRAVEL and COBBLES comprising ballast. (MADE GROUND) *0.30 - 0.60 m: Slightly ashy.*	0.50	D1	
			0.70 (0.80)	Firm bluish grey and mottled brown CLAY. Occasional white shell fragments. (OXFORD CLAY)	1.20	D2	
			1.50	Trial pit ends at 1.50 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:

Depth related remarks:

From	to:	Remarks:

General remarks:

Weather:

Stability: Good

Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP10

Sheet 1 of 1

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	11/05/2020
Checked by:	DD			Length:		End:	11/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	11/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.90)	Reddish brown sandy subangular GRAVEL and COBBLES comprising brick fragments and ballast. (MADE GROUND)	0.80	D1	
			0.90 (1.60)	Firm bluish grey CLAY. Occasional white shell fragments. (OXFORD CLAY)	1.30	D2	
			2.50	Trial pit ends at 2.50 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:

Depth related remarks:

From	to:	Remarks:

General remarks:

Weather:

Stability: Good

Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.

Log issue: FINAL

Scale: 1:25

Project: Stewertby Sidings

Project No: 4329

Client: FCC Environment

Exploratory position reference:

TP11

Sheet 1 of 1

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:	
Logged by:	JT	Method:	Mechanically excavated	Width:		Start:	12/05/2020
Checked by:	DD			Length:		End:	12/05/2020
		Plant:	JCB 3CX	**Orientation:**		Logged:	12/05/2020
		Shoring:	n/a	Bearing =	Grid:		

Backfill/ Instal'n	Water-strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing: Depth	Type & No	Results
			(0.70)	Brown and reddish brown sandy silty subangular GRAVEL and COBBLES comprising brick, ballast with occasional ash and clinker. (MADE GROUND) *0.40 - 0.70 m: Becoming more ashy.*	0.50	D1	
			0.70	Firm bluish grey mottled brown CLAY. Occasional white shell fragments. (OXFORD CLAY)	1.10	D2	
			(0.80)				
			1.50	Trial pit ends at 1.50 m (Target depth)			

Depth	Type & No	Results

Groundwater entries:

Depth:	Rose to:	Remarks:

Depth related remarks:

From	to:	Remarks:

General remarks:
Weather:
Stability: Good
Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: FINAL
Scale: 1:25

Project: Stewertby Sidings
Project No: 4329
Client: FCC Environment

Exploratory position reference:
TP12

APPENDIX C

Analytical Data

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Analytical Report Number : 20-99361

Project / Site name:	Stewartby	**Samples received on:**	12/05/2020
Your job number:	4329	**Samples instructed on:**	12/05/2020
Your order number:	6722	**Analysis completed by:**	14/05/2020
Report Issue Number:	1	**Report issued on:**	15/05/2020
Samples Analysed:	24 soil samples		

Signed: Karolina Marek

Karolina Marek
PL Head of Reporting Team

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509060	1509061	1509062	1509063	1509064
Sample Reference				TP1	TP1	TP2	TP2	TP3
Sample Number				1	2	3	4	5
Depth (m)				0.50	1.50	0.40	2.10	0.50
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	21	27	25	8.7
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.6	7.8	7.7	7.8	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	1.5	0.39	0.59	0.55	1.8
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	3100	780	1200	1100	3600
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	1530	389	589	549	1800
Organic Matter	%	0.1	MCERTS	4.7	1.2	11	4.2	2.5
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.0	< 0.05	0.99	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.27	< 0.05	0.57	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.4	< 0.05	3.2	< 0.05	0.55
Pyrene	mg/kg	0.05	MCERTS	2.0	< 0.05	2.4	< 0.05	0.51
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.76	< 0.05	1.5	< 0.05	0.25
Chrysene	mg/kg	0.05	MCERTS	1.0	< 0.05	1.9	< 0.05	0.32
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.80	< 0.05	1.1	< 0.05	0.30
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.45	< 0.05	0.78	< 0.05	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.87	< 0.05	0.84	< 0.05	0.34
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.52	< 0.05	0.52	< 0.05	0.23
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.82	< 0.05	0.55	< 0.05	0.31
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	9.95	< 0.80	14.4	< 0.80	3.05

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509060	1509061	1509062	1509063	1509064
Sample Reference				TP1	TP1	TP2	TP2	TP3
Sample Number				1	2	3	4	5
Depth (m)				0.50	1.50	0.40	2.10	0.50
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	30	20	17	6.7	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	230	130	300	44	160
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.1	1.5	7.1	1.4	0.98
Boron (water soluble)	mg/kg	0.2	MCERTS	3.9	6.5	4.2	5.9	5.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	< 0.2	0.3	0.4	0.4
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	54	58	30	57	39
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	54	58	30	57	39
Copper (aqua regia extractable)	mg/kg	1	MCERTS	93	11	160	21	64
Lead (aqua regia extractable)	mg/kg	1	MCERTS	170	17	120	15	110
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	57	42	62	41	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	3.4	< 1.0	2.9	2.1	2.1
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	66	76	66	40	42
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	100	120	100	200

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	30
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	30

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	4.8	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	11	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	11	< 10	16	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	16	< 10	32	< 10	< 10

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509060	1509061	1509062	1509063	1509064
Sample Reference				TP1	TP1	TP2	TP2	TP3
Sample Number				1	2	3	4	5
Depth (m)				0.50	1.50	0.40	2.10	0.50
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509065	1509066	1509067	1509068	1509069
Sample Reference				TP3	TP4	TP4	TP5	TP5
Sample Number				6	7	8	9	10
Depth (m)				2.50	1.00	2.00	1.00	2.00
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	21	23	27	12	26
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	8.0	7.9	8.4	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.25	0.38	1.9	1.6	0.14
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	490	770	3800	3200	270
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	247	384	1880	1590	136
Organic Matter	%	0.1	MCERTS	3.9	5.4	2.1	1.6	2.4
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.9	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	2.6	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	17	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	2.6	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.85	< 0.05	14	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.87	< 0.05	11	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.40	< 0.05	5.0	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.58	< 0.05	3.9	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.49	< 0.05	3.2	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.27	< 0.05	2.3	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.32	< 0.05	2.9	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.31	< 0.05	2.0	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.64	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.41	< 0.05	2.4	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	4.50	< 0.80	71.0	< 0.80

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509065	1509066	1509067	1509068	1509069
Sample Reference				TP3	TP4	TP4	TP5	TP5
Sample Number				6	7	8	9	10
Depth (m)				2.50	1.00	2.00	1.00	2.00
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.6	23	6.7	10	17
Barium (aqua regia extractable)	mg/kg	1	MCERTS	83	290	74	480	140
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	3.6	1.3	0.80	2.1
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	2.3	5.7	6.8	5.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	1.0	0.3	0.3	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	56	51	58	29	81
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	57	52	58	29	81
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	140	23	66	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	89	14	140	21
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	64	44	22	47
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.4	2.4	< 1.0	1.9	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	71	42	45	89
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	86	220	100	280	140

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	100	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	110	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	14	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	47	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	52	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	110	< 10

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509065	1509066	1509067	1509068	1509069
Sample Reference				TP3	TP4	TP4	TP5	TP5
Sample Number				6	7	8	9	10
Depth (m)				2.50	1.00	2.00	1.00	2.00
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	-
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509070	1509071	1509072	1509073	1509074
Sample Reference				TP6	TP6	TP7	TP7	TP8
Sample Number				11	12	13	14	15
Depth (m)				1.10	1.80	0.90	1.50	1.10
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	28	37	24	29
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	7.8	7.7	7.7	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.16	0.14	0.54	2.4	0.29
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	320	270	1100	4700	580
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	159	137	536	2360	293
Organic Matter	%	0.1	MCERTS	4.2	5.1	5.3	3.4	0.9
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.42	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.3	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.78	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.76	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.73	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.56	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.34	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.35	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	8.01	< 0.80	< 0.80

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509070	1509071	1509072	1509073	1509074
Sample Reference				TP6	TP6	TP7	TP7	TP8
Sample Number				11	12	13	14	15
Depth (m)				1.10	1.80	0.90	1.50	1.10
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.0	7.7	14	3.8	8.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	310	47	220	29	170
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	6.1	1.1	4.1	1.1	2.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	4.2	3.2	9.3	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3	0.3	0.7	0.4
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	23	47	44	48	61
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	47	45	49	61
Copper (aqua regia extractable)	mg/kg	1	MCERTS	150	17	84	25	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	32	12	27	10	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6	0.5	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	55	37	47	42	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.6	2.2	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	65	41	51	30	52
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	83	91	110	63

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509070	1509071	1509072	1509073	1509074
Sample Reference				TP6	TP6	TP7	TP7	TP8
Sample Number				11	12	13	14	15
Depth (m)				1.10	1.80	0.90	1.50	1.10
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	-	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Styrene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	-	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	< 1.0

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509075	1509076	1509077	1509078	1509079
Sample Reference				TP8	TP9	TP9	TP10	TP10
Sample Number				16	17	18	19	20
Depth (m)				1.50	1.00	1.50	0.50	1.20
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	23	28	24	5.6	21
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	Not-detected	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.5	8.3	8.1	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.36	0.13	0.24	0.80	1.7
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	720	260	490	1600	3500
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	358	129	243	796	1730
Organic Matter	%	0.1	MCERTS	1.4	0.8	1.3	2.7	1.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.37	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.42	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.51	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.29	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.27	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.28	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.22	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.20	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	2.56	< 0.80

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509075	1509076	1509077	1509078	1509079
Sample Reference				TP8	TP9	TP9	TP10	TP10
Sample Number				16	17	18	19	20
Depth (m)				1.50	1.00	1.50	0.50	1.20
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.0	17	4.3	16	7.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	66	150	69	410	76
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.7	1.4	1.5	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	5.8	1.1	5.4	1.9	4.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	0.6	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	56	48	55	30	61
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	56	48	55	30	61
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	23	22	79	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	16	11	33	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6	0.4	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	43	29	38	33	48
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.0	4.0	2.9	< 1.0	1.5
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	50	36	48	46
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	99	48	69	120	95

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509075	1509076	1509077	1509078	1509079
Sample Reference				TP8	TP9	TP9	TP10	TP10
Sample Number				16	17	18	19	20
Depth (m)				1.50	1.00	1.50	0.50	1.20
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	< 1.0

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509080	1509081	1509082	1509083	
Sample Reference				TP11	TP11	TP12	TP12	
Sample Number				21	22	23	24	
Depth (m)				0.80	1.80	0.50	1.10	
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	16	22	21	24	
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.2	7.1	6.8	7.1	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	2.0	0.38	1.9	0.32	
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	4100	770	3900	640	
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	2030	383	1940	319	
Organic Matter	%	0.1	MCERTS	2.9	1.6	11	2.8	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.68	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	0.35	< 0.05	2.0	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	0.35	< 0.05	2.5	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	0.40	< 0.05	2.6	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.69	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.3	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.68	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.89	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	1.10	< 0.80	16.4	< 0.80	

Analytical Report Number: 20-99361

Project / Site name: Stewartby
Your Order No: 6722

Lab Sample Number				1509080	1509081	1509082	1509083	
Sample Reference				TP11	TP11	TP12	TP12	
Sample Number				21	22	23	24	
Depth (m)				0.80	1.80	0.50	1.10	
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	7.6	26	7.2	
Barium (aqua regia extractable)	mg/kg	1	MCERTS	220	76	440	61	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	3.1	1.3	4.2	0.84	
Boron (water soluble)	mg/kg	0.2	MCERTS	4.5	7.2	4.4	3.6	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	< 0.2	0.9	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (III)	mg/kg	1	NONE	87	53	34	34	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	87	53	37	34	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	18	130	9.8	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	15	110	17	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.7	0.5	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	33	35	55	20	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	3.1	1.5	4.5	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	91	43	65	38	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	93	220	71	

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	78	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	80	< 10	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	10	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	55	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	66	< 10	

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Lab Sample Number				1509080	1509081	1509082	1509083	
Sample Reference				TP11	TP11	TP12	TP12	
Sample Number				21	22	23	24	
Depth (m)				0.80	1.80	0.50	1.10	
Date Sampled				11/05/2020	11/05/2020	11/05/2020	11/05/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	< 1.0	
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	

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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1509060	TP1	1	0.50	Brown loam and clay with gravel.
1509061	TP1	2	1.50	Brown clay and sand with gravel.
1509062	TP2	3	0.40	Brown clay and gravel.
1509063	TP2	4	2.10	Brown clay and sand.
1509064	TP3	5	0.50	Brown loam and sand with gravel and vegetation.
1509065	TP3	6	2.50	Brown clay and sand.
1509066	TP4	7	1.00	Brown clay and gravel.
1509067	TP4	8	2.00	Grey clay and sand with gravel.
1509068	TP5	9	1.00	Brown clay and sand with gravel.
1509069	TP5	10	2.00	Brown clay and sand with gravel.
1509070	TP6	11	1.10	Brown clay and gravel with clinker.
1509071	TP6	12	1.80	Brown clay and sand.
1509072	TP7	13	0.90	Brown sand with gravel.
1509073	TP7	14	1.50	Brown clay and sand.
1509074	TP8	15	1.10	Brown clay and sand with gravel.
1509075	TP8	16	1.50	Brown clay and sand.
1509076	TP9	17	1.00	Brown clay and sand with gravel.
1509077	TP9	18	1.50	Grey clay and sand.
1509078	TP10	19	0.50	Brown loam and sand with gravel.
1509079	TP10	20	1.20	Brown clay.
1509080	TP11	21	0.80	Brown loam and clay with gravel.
1509081	TP11	22	1.80	Brown clay and sand.
1509082	TP12	23	0.50	Brown loam and clay with gravel.
1509083	TP12	24	1.10	Brown clay and sand.

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP1	1	S	20-99361	1509060	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP1	1	S	20-99361	1509060	b	Monohydric phenols in soil	L080-PL	b
TP1	1	S	20-99361	1509060	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP1	1	S	20-99361	1509060	b	TPHCWG (Soil)	L088/76-PL	b
TP1	2	S	20-99361	1509061	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP1	2	S	20-99361	1509061	b	Monohydric phenols in soil	L080-PL	b
TP1	2	S	20-99361	1509061	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP1	2	S	20-99361	1509061	b	TPHCWG (Soil)	L088/76-PL	b
TP10	19	S	20-99361	1509078	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP10	19	S	20-99361	1509078	b	Monohydric phenols in soil	L080-PL	b
TP10	19	S	20-99361	1509078	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP10	19	S	20-99361	1509078	b	TPHCWG (Soil)	L088/76-PL	b
TP10	20	S	20-99361	1509079	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP10	20	S	20-99361	1509079	b	TPHCWG (Soil)	L088/76-PL	b
TP10	20	S	20-99361	1509079	b	Volatile organic compounds in soil	L073B-PL	b
TP11	21	S	20-99361	1509080	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP11	21	S	20-99361	1509080	b	Monohydric phenols in soil	L080-PL	b
TP11	21	S	20-99361	1509080	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP11	21	S	20-99361	1509080	b	TPHCWG (Soil)	L088/76-PL	b
TP11	22	S	20-99361	1509081	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP11	22	S	20-99361	1509081	b	TPHCWG (Soil)	L088/76-PL	b
TP11	22	S	20-99361	1509081	b	Volatile organic compounds in soil	L073B-PL	b
TP12	23	S	20-99361	1509082	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP12	23	S	20-99361	1509082	b	Monohydric phenols in soil	L080-PL	b
TP12	23	S	20-99361	1509082	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP12	23	S	20-99361	1509082	b	TPHCWG (Soil)	L088/76-PL	b
TP12	24	S	20-99361	1509083	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP12	24	S	20-99361	1509083	b	Monohydric phenols in soil	L080-PL	b
TP12	24	S	20-99361	1509083	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP12	24	S	20-99361	1509083	b	TPHCWG (Soil)	L088/76-PL	b
TP12	24	S	20-99361	1509083	b	Volatile organic compounds in soil	L073B-PL	b
TP2	3	S	20-99361	1509062	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP2	3	S	20-99361	1509062	b	Monohydric phenols in soil	L080-PL	b
TP2	3	S	20-99361	1509062	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP2	3	S	20-99361	1509062	b	TPHCWG (Soil)	L088/76-PL	b
TP2	4	S	20-99361	1509063	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP2	4	S	20-99361	1509063	b	Monohydric phenols in soil	L080-PL	b
TP2	4	S	20-99361	1509063	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP2	4	S	20-99361	1509063	b	TPHCWG (Soil)	L088/76-PL	b
TP3	5	S	20-99361	1509064	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP3	5	S	20-99361	1509064	b	Monohydric phenols in soil	L080-PL	b
TP3	5	S	20-99361	1509064	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP3	5	S	20-99361	1509064	b	TPHCWG (Soil)	L088/76-PL	b
TP3	6	S	20-99361	1509065	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP3	6	S	20-99361	1509065	b	Monohydric phenols in soil	L080-PL	b
TP3	6	S	20-99361	1509065	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP3	6	S	20-99361	1509065	b	TPHCWG (Soil)	L088/76-PL	b
TP4	7	S	20-99361	1509066	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP4	7	S	20-99361	1509066	b	TPHCWG (Soil)	L088/76-PL	b
TP4	7	S	20-99361	1509066	b	Volatile organic compounds in soil	L073B-PL	b
TP4	8	S	20-99361	1509067	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

TP4	8	S	20-99361	1509067	b	Monohydric phenols in soil	L080-PL	b
TP4	8	S	20-99361	1509067	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP4	8	S	20-99361	1509067	b	TPHCWG (Soil)	L088/76-PL	b
TP5	10	S	20-99361	1509069	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP5	10	S	20-99361	1509069	b	TPHCWG (Soil)	L088/76-PL	b
TP5	9	S	20-99361	1509068	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP5	9	S	20-99361	1509068	b	Monohydric phenols in soil	L080-PL	b
TP5	9	S	20-99361	1509068	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP5	9	S	20-99361	1509068	b	TPHCWG (Soil)	L088/76-PL	b
TP6	11	S	20-99361	1509070	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP6	11	S	20-99361	1509070	b	Monohydric phenols in soil	L080-PL	b
TP6	11	S	20-99361	1509070	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP6	11	S	20-99361	1509070	b	TPHCWG (Soil)	L088/76-PL	b
TP6	12	S	20-99361	1509071	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP6	12	S	20-99361	1509071	b	Monohydric phenols in soil	L080-PL	b
TP6	12	S	20-99361	1509071	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP6	12	S	20-99361	1509071	b	TPHCWG (Soil)	L088/76-PL	b
TP7	13	S	20-99361	1509072	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP7	13	S	20-99361	1509072	b	Monohydric phenols in soil	L080-PL	b
TP7	13	S	20-99361	1509072	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP7	13	S	20-99361	1509072	b	TPHCWG (Soil)	L088/76-PL	b
TP7	14	S	20-99361	1509073	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP7	14	S	20-99361	1509073	b	Monohydric phenols in soil	L080-PL	b
TP7	14	S	20-99361	1509073	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP7	14	S	20-99361	1509073	b	TPHCWG (Soil)	L088/76-PL	b
TP8	15	S	20-99361	1509074	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP8	15	S	20-99361	1509074	b	TPHCWG (Soil)	L088/76-PL	b
TP8	15	S	20-99361	1509074	b	Volatile organic compounds in soil	L073B-PL	b
TP8	16	S	20-99361	1509075	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP8	16	S	20-99361	1509075	b	Monohydric phenols in soil	L080-PL	b
TP8	16	S	20-99361	1509075	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP8	16	S	20-99361	1509075	b	TPHCWG (Soil)	L088/76-PL	b
TP9	17	S	20-99361	1509076	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP9	17	S	20-99361	1509076	b	Monohydric phenols in soil	L080-PL	b
TP9	17	S	20-99361	1509076	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP9	17	S	20-99361	1509076	b	TPHCWG (Soil)	L088/76-PL	b
TP9	18	S	20-99361	1509077	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP9	18	S	20-99361	1509077	b	TPHCWG (Soil)	L088/76-PL	b
TP9	18	S	20-99361	1509077	b	Volatile organic compounds in soil	L073B-PL	b

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

TerraConsult

Site: Stewartby, Bedford

CHEMICAL STATISTICAL ANALYSIS - based on CLEA v1.06 (Sandy Loam 1% SOM)

Job No: 4329

Analyte	Limit of Detection	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult
		TP1	TP1	TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP5	TP6	TP6
		11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
		1509060	1509061	1509062	1509063	1509064	1509065	1509066	1509067	1509068	1509069	1509070	1509071
		0.50	1.50	0.40	2.10	0.50	2.50	1.00	2.00	1.00	2.00	1.10	1.80
Stone Content	<0.1 %	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Asbestos Screen	Positive / Negative	Negative	-	Negative	-	-	-	-	-	-	-	Negative	-
Metals													
Arsenic (total)	<1 mg/kg	30	20	17	6.7	11	5.6	23	6.7	10	17	9	7.7
Boron (water soluble)	<0.2 mg/kg	3.9	6.5	4.2	5.9	5.1	1.9	2.3	5.7	6.8	5	1.5	4.2
Cadmium (total)	<0.2 mg/kg	0.8	< 0.2	0.3	0.4	0.4	< 0.2	1	0.3	0.3	< 0.2	< 0.2	0.3
Chromium (hexavalent)	<4 mg/kg	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (total) (III for S4ULs)	<1 mg/kg	54	58	30	57	39	57	52	58	29	81	24	47
Copper (total)	<1 mg/kg	93	11	160	21	64	18	140	23	66	18	150	17
Lead (total)	<1 mg/kg	170	17	120	15	110	11	89	14	140	21	32	12
Mercury (total inorganic)	<0.3 mg/kg	0.7	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0.8	< 0.3	0.6
Nickel (total)	<1 mg/kg	57	42	62	41	24	38	64	44	22	47	55	37
Selenium (total)	<1 mg/kg	3.4	< 1.0	2.9	2.1	2.1	2.4	2.4	< 1.0	1.9	< 1.0	2.6	2.2
Zinc (total)	<1 mg/kg	150	100	120	100	200	86	220	100	280	140	100	83
Barium	<1 mg/kg	230	130	300	44	160	83	290	74	480	140	310	47
Beryllium	<0.6 mg/kg	2.1	1.5	7.1	1.4	0.98	1.2	3.6	1.3	0.8	2.1	6.1	1.1
Vanadium	<1 mg/kg	66	76	66	40	42	32	71	42	45	89	65	41
Inorganic													
pH Value	pH Units	10.6	7.8	7.7	7.8	7.9	8.2	8	7.9	8.4	8.3	7.1	7.8
Cyanide (total)	<1 mg/kg	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cyanide (free)	<1 mg/kg	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Sulphate (2:1)	<0.00125 g/l	1.5	0.39	0.59	0.55	1.8	0.25	0.38	1.9	1.6	0.14	0.16	0.14
Sulphate (total)	<200 mg/kg	3100	780	1200	1100	3600	490	770	3800	3200	270	320	270
Organic													
Soil Organic Matter	<0.1 %	4.7	1.2	11	4.2	2.5	3.9	5.4	2.1	1.6	2.4	4.2	5.1
Phenol (Total Monohydric)	<1 mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAH													
Naphthalene	<0.05 mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	<0.05 mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	<0.05 mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.9	< 0.05	< 0.05	< 0.05
Fluorene	<0.05 mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	2.6	< 0.05	< 0.05	< 0.05
Phenanthrene	<0.05 mg/kg	1	< 0.05	0.99	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	17	< 0.05	< 0.05	< 0.05
Anthracene	<0.05 mg/kg	0.27	< 0.05	0.57	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	2.6	< 0.05	< 0.05	< 0.05
Fluoranthene	<0.05 mg/kg	1.4	< 0.05	3.2	< 0.05	0.55	< 0.05	0.85	< 0.05	14	< 0.05	< 0.05	< 0.05
Pyrene	<0.05 mg/kg	2	< 0.05	2.4	< 0.05	0.51	< 0.05	0.87	< 0.05	11	< 0.05	< 0.05	< 0.05
Benz(a)anthracene	<0.05 mg/kg	0.76	< 0.05	1.5	< 0.05	0.25	< 0.05	0.4	< 0.05	5	< 0.05	< 0.05	< 0.05
Chrysene	<0.05 mg/kg	1	< 0.05	1.9	< 0.05	0.32	< 0.05	0.58	< 0.05	3.9	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	<0.05 mg/kg	0.8	< 0.05	1.1	< 0.05	0.3	< 0.05	0.49	< 0.05	3.2	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	<0.05 mg/kg	0.45	< 0.05	0.78	< 0.05	0.24	< 0.05	0.27	< 0.05	2.3	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	<0.05 mg/kg	0.87	< 0.05	0.84	< 0.05	0.34	< 0.05	0.32	< 0.05	2.9	< 0.05	< 0.05	< 0.05
Indeno(123cd)pyrene	<0.05 mg/kg	0.52	< 0.05	0.52	< 0.05	0.23	< 0.05	0.31	< 0.05	2	< 0.05	< 0.05	< 0.05
Dibenzo(ah)anthracene	<0.05 mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.64	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	<0.05 mg/kg	0.82	< 0.05	0.55	< 0.05	0.31	< 0.05	0.41	< 0.05	2.4	< 0.05	< 0.05	< 0.05
Total EPA-16 PAHs	<0.8 mg/kg	9.95	< 0.80	14.4	< 0.80	3.05	< 0.80	4.5	< 0.80	71	< 0.80	< 0.80	< 0.80
BTEX													
Benzene	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethyl Benzene	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylene (o)	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylene (m)	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylene (p)	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MTBE	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Petroleum Hydrocarbons													
Aliphatic >C_5 - C_6	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aliphatic >C_6 - C_8	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aliphatic >C_8 - C_{10}	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aliphatic >C_{10} - C_{12}	<1 mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C_{12} - C_{16}	<2 mg/kg	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic >C_{16} - C_{21}	<8 mg/kg	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Aliphatic >C_{21} - C_{35}	<8 mg/kg	< 8.0	< 8.0	< 8.0	< 8.0	30	< 8.0	100	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Total Aliphatic >C_5 - C_{35}	<10 mg/kg	< 10	< 10	< 10	< 10	30	< 10	110	< 10	< 10	< 10	< 10	< 10
Aromatic C_5 - C_7	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aromatic C_7 - C_8	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aromatic >C_8 - C_{10}	<0.001 mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aromatic >C_{10} - C_{12}	<1 mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C_{12} - C_{16}	<2 mg/kg	< 2.0	< 2.0	4.8	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	14	< 2.0	< 2.0	< 2.0
Aromatic >C_{16} - C_{21}	<1 0mg/kg	< 10	< 10	11	< 10	< 10	< 10	< 10	< 10	47	< 10	< 10	< 10
Aromatic >C_{21} - C_{35}	<10 mg/kg	11	< 10	16	< 10	< 10	< 10	< 10	< 10	52	< 10	< 10	< 10
Total Aromatic >C_5 - C_{35}	<10 mg/kg	16	< 10	32	< 10	< 10	< 10	< 10	< 10	110	< 10	< 10	< 10
Chlorinated Hydrocarbons													
Chloromethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Chloroethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Bromomethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Vinylchloride	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Trichlorofluoromethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1-Dichloroethene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Cis-1,2-dichloroethene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1-Dichloroethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
2,2-Dichloropropane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Trichloromethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1,1-Trichloroethane (TCA)	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2-Dichloroethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1-Dichloropropene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Trans-1,2-dichloroethene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Tetrachloromethane/Carbon Tetrachloride	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2-Dichloropropane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Trichloroethene / Trichloroethylene (TCE)	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Dibromomethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Bromodichloromethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Cis-1,3-dichloropropene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Trans-1,3-dichloropropene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1,2-Trichloroethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,3-Dichloropropane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Dibromochloromethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Tetrachloroethene (PCE)	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2-Dibromoethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Chlorobenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1,1,2-Tetrachloroethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Styrene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Tribromomethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,1,2,2-Tetrachloroethane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Isopropylbenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Bromobenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
n-Propylbenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
2-Chlorotoluene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
4-Chlorotoluene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,3,5-Trimethylbenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
tert-Butylbenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2,4-Trimethylbenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
sec-Butylbenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,3 Dichlorobenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
p-Isopropyltoluene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2 Dichlorobenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,4 Dichlorobenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Butylbenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2-Dibromo-3-chloropropane	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2,4 Trichlorobenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
Hexachlorobutadiene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-
1,2,3 Trichlorobenzene	< 0.001 mg/kg	-	-	-	-	-	-	< 0.001	-	-	-	-	-

Analyte	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult	TerraConsult
	TP7	TP7	TP8	TP8	TP9	TP9	TP10	TP10	TP11	TP11	TP12	TP12
	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020	11/05/2020
	1509072	1509073	1509074	1509075	1509076	1509077	1509078	1509079	1509080	1509081	1509082	1509083
	0.90	1.50	1.10	1.50	1.00	1.50	0.50	1.20	0.80	1.80	0.50	1.10
Stone Content	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Asbestos Screen	Negative	-	-	-	-	-	Negative	-	Negative	-	-	-
Metals												
Arsenic (total)	14	3.8	8.6	6	17	4.3	16	7.6	13	7.6	26	7.2
Boron (water soluble)	3.2	9.3	1.8	5.8	1.1	5.4	1.9	4.9	4.5	7.2	4.4	3.6
Cadmium (total)	0.3	0.7	0.4	0.2	0.6	< 0.2	< 0.2	< 0.2	0.7	< 0.2	0.9	< 0.2
Chromium (hexavalent)	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (total) (III for S4ULs)	45	49	61	56	48	55	30	61	87	53	37	34
Copper (total)	84	25	26	22	23	22	79	19	30	18	130	9.8
Lead (total)	27	10	12	11	16	11	33	14	29	15	110	17
Mercury (total inorganic)	0.5	< 0.3	< 0.3	< 0.3	0.6	0.4	< 0.3	0.4	< 0.3	< 0.3	0.7	0.5
Nickel (total)	47	42	35	43	29	38	33	48	33	35	55	20
Selenium (total)	< 1.0	< 1.0	< 1.0	2	4	2.9	< 1.0	1.5	3.1	1.5	4.5	< 1.0
Zinc (total)	91	110	63	99	48	69	120	95	110	93	220	71
Barium	220	29	170	66	150	69	410	76	220	76	440	61
Beryllium	4.1	1.1	2.2	1.3	1.7	1.4	1.5	1.4	3.1	1.3	4.2	0.84
Vanadium	51	30	52	38	50	36	48	46	91	43	65	38
Inorganic												
pH Value	7.7	7.7	8.4	8.1	8.5	8.3	8.1	7.8	9.2	7.1	6.8	7.1
Cyanide (total)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cyanide (free)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Sulphate (2:1)	0.54	2.4	0.29	0.36	0.13	0.24	0.8	1.7	2	0.38	1.9	0.32
Sulphate (total)	1100	4700	580	720	260	490	1600	3500	4100	770	3900	640
Organic												
Soil Organic Matter	5.3	3.4	0.9	1.4	0.8	1.3	2.7	1	2.9	1.6	11	2.8
Phenol (Total Monohydric)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAH												
Naphthalene	0.42	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.68	< 0.05
Acenaphthylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	1.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.37	< 0.05	0.35	< 0.05	2	< 0.05
Anthracene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	1.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.42	< 0.05	0.35	< 0.05	2.5	< 0.05
Pyrene	1.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.51	< 0.05	0.4	< 0.05	2.6	< 0.05
Benz(a)anthracene	0.78	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.29	< 0.05	< 0.05	< 0.05	1.5	< 0.05
Chrysene	0.76	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.27	< 0.05	< 0.05	< 0.05	1.7	< 0.05
Benzo(b)fluoranthene	0.73	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.28	< 0.05	< 0.05	< 0.05	1.7	< 0.05
Benzo(k)fluoranthene	0.28	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.22	< 0.05	< 0.05	< 0.05	0.69	< 0.05
Benzo(a)pyrene	0.56	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.2	< 0.05	< 0.05	< 0.05	1.3	< 0.05
Indeno(123cd)pyrene	0.34	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.68	< 0.05
Dibenzo(ah)anthracene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.27	< 0.05
Benzo(ghi)perylene	0.35	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.89	< 0.05
Total EPA-16 PAHs	8.01	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	2.56	< 0.80	1.1	< 0.80	16.4	< 0.80
BTEX												
Benzene	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethyl Benzene	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylene (o)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylene (m)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylene (p)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MTBE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Petroleum Hydrocarbons												
Aliphatic >C_5 - C_6	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aliphatic >C_6 - C_8	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aliphatic >C_8 - C_{10}	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aliphatic >C_{10} - C_{12}	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C_{12} - C_{16}	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic >C_{16} - C_{21}	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Aliphatic >C_{21} - C_{35}	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	78	< 8.0
Total Aliphatic >C_5 - C_{35}	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	80	< 10
Aromatic C_5 - C_7	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aromatic C_7 - C_8	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aromatic >C_8 - C_{10}	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Aromatic >C_{10} - C_{12}	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C_{12} - C_{16}	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic >C_{16} - C_{21}	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	10	< 10
Aromatic >C_{21} - C_{35}	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	55	< 10
Total Aromatic >C_5 - C_{35}	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	66	< 10
Chlorinated Hydrocarbons												
Chloromethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Chloroethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Bromomethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Vinylchloride	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Trichlorofluoromethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1-Dichloroethene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1,2-Trichloro 1,2,2-Trifluoroethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Cis-1,2-dichloroethene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1-Dichloroethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
2,2-Dichloropropane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Trichloromethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1,1-Trichloroethane (TCA)	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2-Dichloroethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1-Dichloropropene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Trans-1,2-dichloroethene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Tetrachloromethane/Carbon Tetrachloride	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2-Dichloropropane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Trichloroethene / Trichloroethylene (TCE)	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Dibromomethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Bromodichloromethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Cis-1,3-dichloropropene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Trans-1,3-dichloropropene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1,2-Trichloroethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,3-Dichloropropane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Dibromochloromethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Tetrachloroethene (PCE)	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2-Dibromoethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Chlorobenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1,1,2-Tetrachloroethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Styrene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Tribromomethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,1,2,2-Tetrachloroethane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Isopropylbenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Bromobenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
n-Propylbenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
2-Chlorotoluene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
4-Chlorotoluene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,3,5-Trimethylbenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
tert-Butylbenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2,4-Trimethylbenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
sec-Butylbenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,3 Dichlorobenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
p-Isopropyltoluene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2 Dichlorobenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,4 Dichlorobenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Butylbenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2-Dibromo-3-chloropropane	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2,4 Trichlorobenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
Hexachlorobutadiene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001
1,2,3 Trichlorobenzene	-	-	< 0.001	-	-	< 0.001	-	< 0.001	-	< 0.001	-	< 0.001

Analyte	Statistical Analysis					SGV / GAC Statistical Results			SGV / GAC Criteria Source		pC4SL Screening Criteria		pC4SL Criteria Source		LQM/CIEH S4UL Screening Criteria		LQM/CIEH S4UL Criteria Source	
	n	Standard Deviation	Minimum	Average	Maximum	Maximum	Commercial & Industrial Tier 1 Screening Threshold	Pass/ Fail	Source of Screening Criteria	Source of Toxicological Data	Commercial	Pass / Fail	Source of Screening Criteria	Source of Toxicological Data	Commercial	Pass / Fail	Source of Screening Criteria	Source of Toxicological Data
Stone Content		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Screen		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																		
Arsenic (total)	24	7.12	4	12	30	30.00	635	Pass	SC050021*	SC050021	640	Pass	CLEA v1.06	Defra 2014	640	Pass	CLEA v1.06	LQM/CIEH 2014
Boron (water soluble)	24	2.04	1	4	9	9.30	192000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	240000	Pass	CLEA v1.06	LQM/CIEH 2014
Cadmium (total)	15	0.25	0	1	1	1.00	230	Pass	SC050021*	SC050021	420	Pass	CLEA v1.06	Defra 2014	190	Pass	CLEA v1.06	LQM/CIEH 2014
Chromium (hexavalent)	0	#DIV/0!	0	#DIV/0!	0	0.00	35	Pass	CLEA v1.06	LQM 2009	52	Pass	CLEA v1.06	Defra 2014	33	Pass	CLEA v1.06	LQM/CIEH 2014
Chromium (total) (III for S4ULs)	24	15.31	24	50	87	87.00	30400	Pass	CLEA v1.06	LQM 2009	-	-	-	-	8600	Pass	CLEA v1.06	LQM/CIEH 2014
Copper (total)	24	48.65	10	53	160	160.00	71700	Pass	CLEA v1.06	LQM 2009	-	-	-	-	68000	Pass	CLEA v1.06	LQM/CIEH 2014
Lead (total)	24	48.95	10	44	170	170.00	N/A	-	-	-	6000	Pass	CLEA v1.06	Defra 2014	-		-	-
Mercury (total inorganic)	9	0.14	0	1	1	0.80	3640	Pass	SC050021*	SC050021	-	-	-	-	1100	Pass	CLEA v1.06	LQM/CIEH 2014
Nickel (total)	24	11.83	20	41	64	64.00	840	Pass	CLEA v1.071	EFSA	-	-	-	-	980	Pass	CLEA v1.06	LQM/CIEH 2014
Selenium (total)	16	0.84	2	3	5	4.50	13000	Pass	SC050021*	SC050021	-	-	-	-	120000	Pass	CLEA v1.06	LQM/CIEH 2014
Zinc (total)	24	56.60	48	120	280	280.00	662000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	730000	Pass	CLEA v1.06	LQM/CIEH 2014
Barium	24	132.82	29	178	480	480.00	22000	Pass	CLEA v1.06	IC/AGS/CL:AIR	-	-	-	-	-		-	-
Beryllium	24	1.67	1	2	7	-	-	-	-	-	-	-	-	-	-		-	-
Vanadium	24	17.11	30	53	91	91.00	3160	Pass	CLEA v1.06	LQM 2009	-	-	-	-	9000	Pass	CLEA v1.06	LQM/CIEH 2014
Inorganic											-	-	-	-	-	-		
pH Value	24	0.76	6.8	8	10.6	10.60	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	0	#DIV/0!	0	#DIV/0!	0.0	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (free)	0	#DIV/0!	0.0	#DIV/0!	0.0	0.00	34	Pass	ATRISK SOIL	ATRISK SOIL	-	-	-	-	-	-	-	-
Sulphate (2:1)	24	0.75	0.13	1	2	2.40	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (total)	24	1517.32	260.00	1719	4700	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic											-	-	-	-	-	-		
Soil Organic Matter	24	2.74	0.8	3	11.00	11.00	-	-	-	-	-	-	-	-	-	-	-	-
Phenol (Total Monohydric)	0	#DIV/0!	0	#DIV/0!	0.0	0.00	24200	Pass	CLEA v1.06	SC050021	-	-	-	-	760	Pass	CLEA v1.06	LQM/CIEH 2014
PAH																		
Naphthalene	2	0.18	0.4	1	0.7	0.68	200	Pass	CLEA v1.06	LQM 2009	-	-	-	-	190	Pass	CLEA v1.06	LQM/CIEH 2014
Acenaphthylene	0	#DIV/0!	0.0	#DIV/0!	0.0	0.00	84000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	83000	Pass	CLEA v1.06	LQM/CIEH 2014
Acenaphthene	1	#DIV/0!	1.9	2	1.9	1.90	8500	Pass	CLEA v1.06	LQM 2009	-	-	-	-	84000	Pass	CLEA v1.06	LQM/CIEH 2014
Fluorene	1	#DIV/0!	2.6	3	2.6	2.60	64000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	63000	Pass	CLEA v1.06	LQM/CIEH 2014
Phenanthrene	7	6.08	0.4	3	17.0	17.00	22000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	22000	Pass	CLEA v1.06	LQM/CIEH 2014
Anthracene	3	1.27	0.3	1	2.6	2.60	530000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	520000	Pass	CLEA v1.06	LQM/CIEH 2014
Fluoranthene	9	4.33	0.4	3	14.0	14.00	23000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	23000	Pass	CLEA v1.06	LQM/CIEH 2014
Pyrene	9	3.33	0.4	2	11.0	11.00	54400	Pass	CLEA v1.06	LQM 2009	-	-	-	-	54000	Pass	CLEA v1.06	LQM/CIEH 2014
Benz(a)anthracene	8	1.57	0.3	1	5.0	5.00	92	Pass	CLEA v1.06	LQM 2009	-	-	-	-	170	Pass	CLEA v1.06	LQM/CIEH 2014
Chrysene	8	1.21	0.3	1	3.9	3.90	138	Pass	CLEA v1.06	LQM 2009	-	-	-	-	350	Pass	CLEA v1.06	LQM/CIEH 2014
Benzo(b)fluoranthene	8	0.98	0.3	1	3.2	3.20	100	Pass	CLEA v1.06	LQM 2009	-	-	-	-	44	Pass	CLEA v1.06	LQM/CIEH 2014
Benzo(k)fluoranthene	8	0.70	0.2	1	2.3	2.30	140	Pass	CLEA v1.06	LQM 2009	-	-	-	-	1200	Pass	CLEA v1.06	LQM/CIEH 2014
Benzo(a)pyrene	8	0.88	0.2	1	2.9	2.90	14	Pass	CLEA v1.06	LQM 2009	77	Pass	CLEA v1.06	Defra 2014	35	Pass	CLEA v1.06	LQM/CIEH 2014
Indeno(123cd)pyrene	7	0.61	0.2	1	2.0	2.00	60	Pass	CLEA v1.06	LQM 2009	-	-	-	-	500	Pass	CLEA v1.06	LQM/CIEH 2014
Dibenzo(ah)anthracene	2	0.26	0.3	0	0.6	0.64	13	Pass	CLEA v1.06	LQM 2009	-	-	-	-	3.5	Pass	CLEA v1.06	LQM/CIEH 2014
Benzo(ghi)perylene	7	0.73	0.3	1	2.4	2.40	650	Pass	CLEA v1.06	LQM 2009	-	-	-	-	3900	Pass	CLEA v1.06	LQM/CIEH 2014
Total EPA-16 PAHs	9	21.83	1.1	15	71.0	71.00	-	-	-	-	-	-	-	-	-	-	-	-
BTEX																		
Benzene	0	#DIV/0!	0.000	#DIV/0!	0.000	0.00	43.6	Pass	CLEA v1.06	SC050021	100	Pass	CLEA v1.06	Defra 2014	27	Pass	CLEA v1.06	LQM/CIEH 2014
Toluene	0	#DIV/0!	0.000	#DIV/0!	0.000	0.00	86200	Pass	CLEA v1.06	SC050021	-	-	-	-	56000	Pass	CLEA v1.06	LQM/CIEH 2014
Ethyl Benzene	0	#DIV/0!	0.000	#DIV/0!	0.000	0.00	25000	Pass	CLEA v1.06	SC050021	-	-	-	-	5700	Pass	CLEA v1.06	LQM/CIEH 2014
Xylene (o)	0	#DIV/0!	0.000	#DIV/0!	0.000	0.00	10,700	Pass	CLEA v1.06	SC050021	-	-	-	-	6600	Pass	CLEA v1.06	LQM/CIEH 2014
Xylene (m)	0	#DIV/0!	0.000	#DIV/0!	0.000	0.00	9,990	Pass	CLEA v1.06	SC050021	-	-	-	-	6200	Pass	CLEA v1.06	LQM/CIEH 2014
Xylene (p)	0	#DIV/0!	0.000	#DIV/0!	0.000	0.00	9,630	Pass	CLEA v1.06	SC050021	-	-	-	-	5900	Pass	CLEA v1.06	LQM/CIEH 2014
MTBE	0	#DIV/0!	0.000	#DIV/0!	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons																		
Aliphatic >C_5 - C_6	0	#DIV/0!	0.00	#DIV/0!	0.0	0.00	3400	Pass	CLEA v1.06	LQM 2009	-	-	-	-	3200	Pass	CLEA v1.06	LQM/CIEH 2014
Aliphatic >C_6 - C_8	0	#DIV/0!	0.00	#DIV/0!	0.0	0.00	8300	Pass	CLEA v1.06	LQM 2009	-	-	-	-	7800	Pass	CLEA v1.06	LQM/CIEH 2014
Aliphatic >C_8 - C_{10}	0	#DIV/0!	0	#DIV/0!	0.0	0.00	2100	Pass	CLEA v1.06	LQM 2009	-	-	-	-	2000	Pass	CLEA v1.06	LQM/CIEH 2014
Aliphatic >C_{10} - C_{12}	0	#DIV/0!	0	#DIV/0!	0.0	0.00	10000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	9700	Pass	CLEA v1.06	LQM/CIEH 2014
Aliphatic >C_{12} - C_{16}	0	#DIV/0!	0	#DIV/0!	0.0	0.00	61000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	59000	Pass	CLEA v1.06	LQM/CIEH 2014
Aliphatic >C_{16} - C_{21}	0	#DIV/0!	0	#DIV/0!	0.0	0.00	1600000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	160000	Pass	CLEA v1.06	LQM/CIEH 2014
Aliphatic >C_{21} - C_{35}	3	35.80	30	69	100.0	100.00	1600000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	160000	Pass	CLEA v1.06	LQM/CIEH 2014
Total Aliphatic >C_5 - C_{35}	3	40.41	30	73	110.0	110.00	-	-	-		-	-	-	-	-	-	-	
Aromatic C_5 - C_7	0	#DIV/0!	0	#DIV/0!	0.00	0.00	28000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	26000	Pass	CLEA v1.06	LQM/CIEH 2014
Aromatic C_7 - C_8	0	#DIV/0!	0	#DIV/0!	0.00	0.00	59000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	56000	Pass	CLEA v1.06	LQM/CIEH 2014
Aromatic >C_8 - C_{10}	0	#DIV/0!	0	#DIV/0!	0.0	0.00	3700	Pass	CLEA v1.06	LQM 2009	-	-	-	-	3500	Pass	CLEA v1.06	LQM/CIEH 2014
Aromatic >C_{10} - C_{12}	0	#DIV/0!	0	#DIV/0!	0.0	0.00	17000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	16000	Pass	CLEA v1.06	LQM/CIEH 2014
Aromatic >C_{12} - C_{16}	2	6.51	5	9	14.0	14.00	36000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	36000	Pass	CLEA v1.06	LQM/CIEH 2014
Aromatic >C_{16} - C_{21}	3	21.08	10	23	47.0	47.00	28000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	28000	Pass	CLEA v1.06	LQM/CIEH 2014
Aromatic >C_{21} - C_{35}	4	23.22	11	34	55.0	55.00	28000	Pass	CLEA v1.06	LQM 2009	-	-	-	-	28000	Pass	CLEA v1.06	LQM/CIEH 2014
Total Aromatic >C_5 - C_{35}	4	41.60	16	56	110.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																		
Chloromethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinylchloride	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	0.06	Pass	CLEA v1.06	Former TOX	-	-	-	-	0.059	Pass	CLEA v1.06	LQM/CIEH 2014
Trichlorofluoromethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Cis-1,2-dichloroethene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloromethane	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	107	Pass	CLEA v1.06	LQM 2009	-	-	-	-	99	Pass	CLEA v1.06	LQM/CIEH 2014
1,1,1-Trichloroethane (TCA)	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	700	Pass	CLEA v1.06	LQM 2009	-	-	-	-	660	Pass	CLEA v1.06	LQM/CIEH 2014
1,2-Dichloroethane	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	0.71	Pass	CLEA v1.06	LQM 2009	-	-	-	-	0.67	Pass	CLEA v1.06	LQM/CIEH 2014
1,1-Dichloropropene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Trans-1,2-dichloroethene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloromethane/Carbon Tetrachloride	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	3.04	Pass	CLEA v1.06	LQM 2009	-	-	-	-	2.9	Pass	CLEA v1.06	LQM/CIEH 2014
1,2-Dichloropropane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene / Trichloroethylene (TCE)	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	11.9	Pass	CLEA v1.06	LQM 2009	-	-	-	-	1.2	Pass	CLEA v1.06	LQM/CIEH 2014
Dibromomethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Cis-1,3-dichloropropene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Trans-1,3-dichloropropene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	131	Pass	CLEA v1.06	LQM 2009	-	-	-	-	19	Pass	CLEA v1.06	LQM/CIEH 2014
1,2-Dibromoethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	59	Pass	CLEA v1.06	LQM 2009	-	-	-	-	56	Pass	CLEA v1.06	LQM/CIEH 2014
1,1,1,2-Tetrachloroethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Tribromomethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Propylbenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3 Dichlorobenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	32.1	Pass	CLEA v1.06	LQM 2009	-	-	-	-	30	Pass	CLEA v1.06	LQM/CIEH 2014
p-Isopropyltoluene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2 Dichlorobenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	2140	Pass	CLEA v1.06	LQM 2009	-	-	-	-	2000	Pass	CLEA v1.06	LQM/CIEH 2014
1,4 Dichlorobenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	0.00	4460	Pass	CLEA v1.06	LQM 2009	-	-	-	-	4400	Pass	CLEA v1.06	LQM/CIEH 2014
Butylbenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4 Trichlorobenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	220	Pass	CLEA v1.06	LQM/CIEH 2014
Hexachlorobutadiene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-			-	-	31	Pass	CLEA v1.06	LQM/CIEH 2014
1,2,3 Trichlorobenzene	0	#DIV/0!	0.00	#DIV/0!	0.00	-	-	-	-	-	-	-	-	-	102	Pass	CLEA v1.06	LQM/CIEH 2014

▨ Below Detection Limits.

🟨 Exceeded GAC/SGV

🟥 Exceeded pC4SL / S4ULs

🟧 Assessment criteria for pH, Sulphide and Sulphate are not based on human health. Sulphate criteria assumes DS-1 ACEC classification for concrete.

Notes

1. Generic Qualitative Assessment Criteria have been used where appropriate based on the current CLEA 1.06 Model (default values, sandy loam 1%SOM). Where no CLEA generic guideline value has been calculated no assessment has been made. The results presented show maximum and mean concentrations. This is to provide a reasonable prediction of the range of data rather than to provide any detailed statistical appraisal.
2. Results lower than detection limit are shaded in grey.
3. When the test result is recorded as being less than the detection limit, the result used for the analysis is the detection limit.
4. Cyanide (total)*, in the absence of a GQAC based on current CLEA 1.06 Model, the Atrisk Soil Value for Cyanide (free) has been used.
5. For metals, where an SGV has been published, this value has been used. Note that the published SGVs do not include the residential without plant uptake scenario. CLEA v1.06 has therefore been used to derive GACs for this scenario. For organics, CLEA v1.06 has been used (as the SGV assumes 6% SOM)
6. pC4SL based on adjusted toxicology and exposure assumptions
7. pC4SL for benzene assumes 6% SOM

APPENDIX D

Service Constraints, Report Limitations & Planning Requirements

Service Constraints, Report Limitations & Planning Requirements

This consultancy contract, report and the site investigation (together comprise the "Services") were compiled and carried out by TerraConsult Limited (TCL) for FCC Environment and Renewi PLC (the "client") on the basis of a defined programme and scope of works and the terms of a contract between TCL and the "client." The Services were performed by TCL with all reasonable skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by TCL taking into account the limits of the scope of works required by the client, the prevailing site conditions, the time scale involved and the resources, including financial and manpower resources, agreed between TCL and the client. TerraConsult Ltd cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered out with the agreed scope of works.

Other than that expressly contained in the above paragraph, TCL provides no other representation or warranty whether express or implied, is made in relation to the Services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of TCL. If a third party relies on this report, it does so wholly at its own and sole risk and TCL disclaims any liability to such parties.

It is TCL's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without TCL 's review and advice shall be at the client's sole and own risk.

The information contained in this report is protected by disclosure under Part 3 of the Environmental Information Regulations 2004 pursuant to the provisions of Regulation 12(5) without the consent in writing of a Director of TerraConsult Limited.

The report was written in July 2020 and should be read in light of any subsequent changes in legislation, statutory requirements and industry practices. Ground conditions can also change over time and further investigations or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of TCL. In the absence of such written advice of TCL, reliance on the report in the future shall be at the client's own and sole risk. Should TCL be requested to review the report in the future, TCL shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between TCL and the client.

The observations and conclusions described in this report are based solely upon the Services that were provided pursuant to the agreement between the client and TCL. TCL has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report. TCL is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, TCL did not seek to evaluate the presence on or off the site of electromagnetic fields or materials in buildings (i.e. materials inside or as part of the building fabric) such as asbestos, lead paint, radioactive or hazardous materials.

The Services are based upon TCL's observations of existing physical conditions at the site gained from a walkover survey of the site together with TCL's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst TerraConsult Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report. Further TCL was not authorised and did not attempt to independently verify the accuracy or completeness of

information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. TCL is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to TCL and including the doing of any independent investigation of the information provided to TCL save as otherwise provided in the terms of the contract between the client and TCL.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and TCL] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site.

Throughout the report the term ‘geotechnical’ is used to describe aspects relating to the physical nature of the site (such as foundation requirements) and the term ‘geoenvironmental’ is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. The geoenvironmental sections are written in broad agreement with BS 10175:2011+A2 2017. For the geotechnical aspects of the report, the general requirements of Eurocode 7 (BS EN 1997-2:2007) are to produce a Ground Investigation Report (GIR) which shall form part of the Geotechnical Design Report (GDR). The geotechnical section of this report is intended to fulfil the general requirements of the GIR as outlined in BS EN 1997-2, Section 6. The GIR contains the factual information including geological features and relevant data, and a geotechnical evaluation of the information stating the assumptions made in the interpretation of the test results. This report shall not be considered as being a GDR.

Planning Requirements

The National Planning Policy Framework (NPPF, 2019) emphasises the presumption in favour of sustainable development. Paragraph 11, which defines the presumption in favour of sustainable development, has two similar clauses which related to potentially contaminated land and sensitive receptors:

11 Plans and decisions should apply a presumption in favour of sustainable development.

*For **plan-making** this means that:*

b) strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas, unless:

i) the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for restricting the overall scale, type or distribution of development in the plan area;

*For **decision-taking** this means:*

d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:

ii) the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed

In accordance with the NPPF, areas or assets of particular importance are defined as:

habitats sites (and those sites listed in paragraph 176 – potential Special Protection Areas and Possible Areas of Conservation; listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites) and/or designated as Sites of Special Scientific Interest; land designated as Green Belt, Local Green Space, an Area of Outstanding Natural Beauty, a National Park (or within the Broads Authority) or defined as Heritage Coast; irreplaceable habitats; designated heritage assets (and other heritage assets of archaeological interest referred to in footnote 63 (Non-designated heritage assets of archaeological interest, which are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.); and areas at risk of flooding or coastal change.

Paragraph 118 states that planning policies and decisions should:

- *give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land;*

Paragraph 170 clarifies that enhancing the natural environment includes:

Planning policies and decisions should contribute to and enhance the natural and local environment by:

- *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*

- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

Paragraph 180 of NPPF states that planning policies and decisions should ensure the following:

- *Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.*

Paragraph 178 of NPPF states that planning policies and decisions for developments should also ensure that:

a) *a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);*

b) *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*

c) *adequate site investigation information, prepared by a competent person, is available to inform these assessments.*

Paragraph 179 states that where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

This report has been prepared and authorised by staff that are competent as defined in the NPPF.

Unexploded Ordnance

Clients have a legal duty under the CDM 2015 Regulations to provide designers and contractors with project-specific health and safety information needed to identify hazards and risks. This includes the possibility of unexploded ordnance (UXO) being encountered on the site. Further details are given in CIRIA Report C681 (Stone et al 2009). A non-UXO specialist screening exercise has been carried out for the site by considering any evidence of UK defence activities on or near the site evident from the gathered desk study information and the unexploded aerial delivered bomb (UXB) regional risk maps produced by Zetica. Other data sources are available, but as a first stage screening exercise the freely available Zetica maps have been used. The level of risk stated is that determined by Zetica, a company experience in the desk study, field investigation and clearance of UXO/UXB.







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PICS THE CONTRACTORS' CHOICE

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Appendix D – Stewartby Landfill Site: Site Report

Environmental Simulations International Ltd

Stewartby Landfill Site: Site Report

Environmental Simulations International Ltd

Stewartby Landfill Site: Site Report

Prepared for

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Report reference: . 6397R2 October 2003
Report status: Final

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Stewartby Landfill Site: Site Report

This report has been prepared by Environmental Simulations International Ltd. (ESI) in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client, and is provided by ESI solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to ESI at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. Should the client wish to release this report to a third party for that party's reliance, ESI may, by prior written agreement, agree to such release, provided that it is acknowledged that ESI accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. ESI accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against ESI except as expressly agreed with ESI in writing.

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1 INTRODUCTION

1.1 Report Context

This document comprises the Site Report in support of the PPC application for Stewartby Landfill Site (hereafter referred to as 'the Site'). The operator of the site is Shanks Waste Services Ltd ('Shanks').

This report has been prepared on behalf of Shanks by Environmental Simulations International Ltd ('ESI').

The application is for the whole of the Stewartby Landfill Site, with the exception of the Leachate Treatment Plant for which a separate PPC application is being made. However, this report refers specifically to the areas of the site within the permit boundary, but outside the waste mass areas, in answer to question 1.1.36 on the PPC application.

The Site was originally worked from 1953-1960 as a clay pit extracting Oxford Clay for the adjacent Stewartby Brickworks. It has been in operation as a landfill since the 1976. The most recent planning permission (reference 4/1980) was granted by Bedfordshire County Council in July 1980. The most recent Waste Management Licence (number 4/1986) was issued in November 1986. This licence has been the subject of a number of modifications since then.

The Site is an existing landfill which is being surcharged in the areas known as Phases 1-6. The surcharging involves removal of the existing capping, emplacement of waste followed by a new engineered cap and restoration soils

1.2 Installation Details

1.2.1 Site Location and Access

Stewartby Landfill Site lies just over 800 m north west of Stewartby village and about 7 km south west of the centre of Bedford, with the centre of Site at NGR TL 015435. The PPC application site boundary is shown on Figure 2.1

The main site access is from Green Lane to the southwest of the Site. Additionally, there is an access point for authorised traffic from Broadmead Road to the northeast of the Site, 200m from the A421, and an access point for quarry vehicles on the same road, 500m from the A421.

1.2.2 Site Security

The site is fenced along the southern, western and northern boundaries to prevent un authorised access, with 2.5m high security fence topped with barbed wire. The eastern boundary (with the adjacent Stewartby Brickworks) comprises a combination of earth bunds and fencing. 2.5m high steel lockable gates and electronic barriers are located at the Green Lane and Broadmead Road quarry vehicle entrances, with 5 bar wooden gates at the Broadmead authorised traffic entrance. These features are all shown in Shanks Drawing No: S.2003/LF/PPC1.

1.2.3 Landfill Classification

The Site currently operates as a hazardous site, with a wide range of waste including household, industrial, commercial and Special Waste. From July 2004, co-disposal will end, and the site will accept non hazardous waste only.

1.2.4 Site Context

The site is approximately rectangular in shape, and over 1 km long along its long axis (north east to south west). The total site area is approximately 88 ha, with the landfill occupying 76 ha. Ground levels adjacent to the site are typically around 35-40 mAOD whilst the highest point of the restored landfill will be 60 mAOD (post settlement). Stewartby Brickworks are located adjacent to the site to the south.

Potential environmental receptors are shown on Figure 3.2 of the Hydrogeological Risk Assessment Report (ESI, 2003). There are two water significant water bodies in close proximity, namely Stewartby Lake and Elstow Brook. The former is a flooded brick pit located immediately to the south of the site and used as a recreation area. This lake overflows into the Elstow Brook, which flows along the south eastern boundary of the site. The nearest settlements are Stewartby village approximately 0.7km to the southeast, Lower Shelton approximately 0.7km to the southwest, and Wootton approximately 0.8km to the north. There are some scattered farms located in the vicinity of the site.

2 SITE REPORT

This section provides the baseline report for the areas of the site within the site permit boundary but outside the waste deposition area. The non landfill areas occupy approximately 12 ha. Most of this land is located in the south of the site, and is occupied by site office buildings, car parks, access roads, power station and the waste reception areas. This latter includes railway sidings.

The comments and descriptions made in the following sections are based on a site visit undertaken by ESI on 15 September 2003, accompanied by Shanks personnel, together with information provided by Shanks during the site visit. It is understood that a review of the oil storage facilities at the site has been undertaken recently by the Environment Agency, and that Shanks are in the process of responding to and acting on Agency comments.

2.1.1 Geology and Hydrogeology

The geology of the area comprises Oxford Clay overlying Kellaways Sand, which in turn is underlain by a succession of thin clays and subsequently the Blisworth Limestone. The Kellaways Sand is classified by the Environment Agency as a Minor Aquifer, but it is very thin, has low permeability and is of very poor quality. The Blisworth Limestone is also of classified as a Minor Aquifer, but again provides a very limited resource due to poor quality and low permeability.

The geology and hydrogeology of the site and area, including flood plains, source protection zones, groundwater vulnerability and groundwater and surface water abstractions are described in detail in the Conceptual Model and Hydrogeological Risk Assessment Report (ESI, 2003).

2.1.2 Hydrochemistry

The baseline chemistry of the groundwater and surface water is described in the Conceptual Model and Hydrogeological Risk Assessment Report (ESI, 2003), together with the location of all groundwater and surface water monitoring points.

2.1.3 Description of non landfill operations

For the purpose of describing the non landfill operations, the area outside the waste has been subdivided into the following areas:

- Car park, offices and weighbridge
- Power station
- Railbourne Waste reception area
- Access Roads

Only aspects of potential contamination are relevant to this application, and these are described in the following sections. Key locations described below are shown in Figure 2.1.

2.1.3.1 Car park, offices and weighbridge

The majority of surface water collecting on the entrance road and the hard standing in these areas are reported to drain to the Elstow Brook. No specific information concerning the drainage system was available. It is understood from Shanks personnel that some water drains to a small lagoon located adjacent to and east of Phase 2. Spill kits are distributed around this area to contain any potentially contaminating liquid spillages from vehicles. All collected liquid and used spill kit material are subsequently collected for disposal to an appropriately licensed site.

Welfare facilities are located in the site office, and in the weighbridge, and drain to separate cesspits located in the car park area.

2.1.3.2 Power Station

The power station at the site has been constructed to utilise landfill gas. The main station building is constructed with a concrete base, into which drainage channels have been laid. All waste water, together with condensate, from within the station building drains to an underground tank at the front of the building, which is subsequently emptied by tanker and disposed of at an appropriately licensed disposal site. It was not possible to access the tank during the site visit.

Along the western side of the building there are two small locked paint store cupboards. There are 5 oil tanks located at the northern end of the building, as follows:

- Two 8,800 litre tanks with integral metal bunds for new oil
- One 5,700 litre tank on pillars within a large concrete bund for new oil
- One 14,000 litre tank on pillars within the same large concrete bund for new oil
- One 6000 litre tank for waste oil, located within the same concrete bund, but under the new oil tanks.

The tanks are located on two sides of a concrete area of hardstanding that drains to one corner. The filling points for the two 8,800 tanks are located outside their bunds but over this concrete area. The filling points for the other tanks are within the concrete bund. A drain cover is located in one corner of the bund, and it is understood that both the bund and the concrete hardstanding drain by underground pipe to the underground tank described above.

To the north of the main station building, chemicals, mainly comprising cleaners, degreasers and compressor/valve oils are stored in a covered shed, with a concrete drainage tray at the base. The storage area is situated directly above the collection tray.

At the northern end of the power station compound there is a second building containing gas compressors, built on concrete bases. Rainwater from the roof of this building drains to a soakaway. Condensate collected from the gas is pumped or tankered back into the landfill. Drums of compressor oil are located within this building, with their filling points located over drip trays.

2.1.3.3 Railbourne Waste Reception

Waste is brought into this area by train in metal containers. Household waste containers are transferred to trucks for transport to the waste face. Spoil or other suitable wastes are transferred from open containers into dump trucks for transport to the waste face.

At the southern end of the railbourne waste reception area, there is an open ‘sheepdip’ style wheel wash that is used in winter. Although there are drainage pipes in the sides, these are blocked, and the water is removed by tanker as necessary for disposal at a suitably licensed facility. There is a self contained covered monsoon wheel wash, within which water is recirculated via a series of small concrete settlement tanks.

It is understood that the fuel storage arrangements in the railbourne waste reception area are undergoing review at present, in consultation with the Environment Agency. At the time of the site visit there was a partially bunded fuel filling point located on the access road between the railways sidings, with a pipe passing under the railway to a tank located to the west. The tank is located within a concrete bund. There was evidence of some oil staining on the hardcore adjacent to the tank at the vehicle refueling point. It is understood that this facility will be replaced with a new suitably bunded oil storage facility in November 2003.

There is a machinery washdown point located outside the Plant Workshop. This drains to a shallow concrete tank covered by a metal grille. The tank is emptied as necessary for disposal of at a suitably licensed facility.

The Plant Workshop is a concrete floored building. In one corner, a concrete bunded area has been constructed to house two 2000 litre metal oil tanks, and oil drums. Other oil drums

in use within the building are stored over drip trays. Waste oil is stored in a metal bunded tank in front of the workshop, and heating oil stored in a bunded tank at the rear.

To the south of the building there is a water tank, and an underground biodigester for the workshop toilet. There is also a lockable solvent store, but no solvents were being stored at the time of the site visit.

2.1.3.4 Access Roads and Other Areas

It is understood that the access road along the southeastern boundary of the site is constructed on made ground that is likely to comprise material from the brickworks. The extent and nature of this material is not known but is unlikely to contain potential contamination in any significant amount.

There is a dip in the access road as it passes the Stewartby Treatment Plant. A gravel filled shallow excavation into the clay allows surface water and runoff to be collected and removed to a suitably licensed facility.

Tank No 3, shown on Figure 2.1, is located on the site of a former lagoon that has been infilled with clay, overlain by hardcore. The tank is located within a bund, on the area of hardcore, which enables any runoff or leakage to be collected at a sump at the base of the hardcore. The tank is a temporary store for leachate, which is either pumped to the leachate treatment plant or tankered off site for disposal.

To the north of the waste reception area, the access road continues around the perimeter of the site, between the edge of waste and the Elstow Brook. Drainage ditches run between the road and the Brook, and between the waste and the road, with sluice gates at intervals that can be closed to restrict the impact of any contamination incident on the Brook. The Marston Vale pipeline crosses the site adjacent to the perimeter, with intermittent inspection hatches. The pipeline transfers treated leachate off site from the Leachate Treatment Plant.

In the north of the site, there is a small vehicle wheel spinner adjacent to the quarry access gate. This is a dry wheel cleaning devise, and therefore there is no water to dispose of.

2.1.4 Summary of Potential Impacts

The non landfill areas described above are underlain either by up to 20m of clay, or by made ground resulting from the adjacent brickworking activities, which is likely to comprise dominantly clay. The low permeability, thickness and attenuating properties of the clay will provide considerable protection to the underlying Kellaways Sand and Blisworth Limestone.

All tanks observed on site were contained within bunds. Although the adequacy of these could not be confirmed during the site visit, they are the subject of a recent inspection by the Environment Agency and Shanks are involved in a programme of responding to Agency comments. Likewise, oil drums and chemical containers were stored over drip trays. It is therefore likely that any leakage or spillage would be adequately contained to prevent contamination of the groundwater or Elstow Brook. Whilst there was evidence of spillage adjacent to the fuel tank in the railbourne waste reception areas, the extent of this indicated it was likely to arise from drips and splashes during refueling rather than a major pollution incident. Given the thickness of clay beneath this area and distance to the Brook, the impact on the Kellaways Sand or surface water quality is likely to be negligible.

The only opportunity for the potential for the direct discharge to the Elstow Brook is via the surface water drainage system. In the northern part of the site, sluice gates exist to restrict the connection between surface water drainage and the Brook. In the car park area, protection of the Brook will rely on effective use of the spill kits.

3 REFERENCES

ESI, 2003. Conceptual Model and Hydrogeological Risk Assessment Report: Stewartby Landfill Site. 6397R1. October 2003

FIGURES

APPENDICES

APPENDIX A

Historical Maps

IRELAND | UK | UAE | BAHRAIN | KSA

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