Report

Desk Study & Ground Investigation

Geoenvironmental and Geotechnical Assessment

Knoxbridge Farm

Knox Bridge, Kent

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1. Introduction

1.1 General

Sweco was commissioned by Green Create W2V Kent Ltd to complete a combined Desk Study and Ground Investigation to establish preliminary geotechnical and environmental ground conditions at a Site located to the northeast of Knoxbridge Farm, here in referred to as the Site. The Site location is shown on 120932-NRG-DWG-0400 and the proposed site layout is shown on drawing 120932-NRG-DWG-0401.

The investigation is required to inform the proposed Site development for an Anaerobic Digestion (AD) Plant and associated infrastructure.

1.2 Report Structure

1.2.1 Desk Study

Desk-based information contained within this report has been compiled through Site reconnaissance, regulatory consultation, environmental data review and mapping research (historical, geological and hydrogeological). The historical maps are included in ***Appendix A***.

The information obtained was assessed against the current and proposed Site uses to enable potential geotechnical and contamination issues to be identified through the development of a Conceptual Site Model (CSM). This allowed an appropriate Ground Investigation to be designed to further investigate these potential issues.

1.2.2 Ground Investigation

Following Desk Study recommendations, an intrusive ground investigation was undertaken at the Site in accordance with UK best practice, BS10175: Code of Practice for Investigating Potentially Contaminated Sites and BS5930: Code of Practice for Site Investigations. The investigation resulted in geotechnical and environmental data sets in the form of factual Ground Investigation data (***Appendix H***), gas and groundwater monitoring data (***Appendix D***), and associated laboratory chemical analysis results (***Appendix E***).

1.2.3 Assessment

Chemical test results have been reviewed and a human health and controlled waters risk assessment has been undertaken to identify potentially significant pollutant linkages at the Site through the development of a Conceptual Site Model (CSM). The assessment also identifies the potential for any environmental liabilities associated with the Site and makes recommendations regarding the suitability of the Site for its proposed use in line with local authority planning guidance.

A geotechnical appraisal has been undertaken to identify potential risks associated with the proposed development and provide recommendations for possible foundation solutions. Recommendations for any works required to further investigate and / or mitigate any identified potential risks have been outlined.

2. Desk Study

2.1 Site Description

The Site is located approximately 2.5 km south of Staplehurst village centre, Kent, and comprises approximately 14.5 hectares of land.

The National Grid Reference for the approximate centre of the Site is 579450, 141170.

The Site forms the northeast corner of Knox Bridge Farm. The Site is currently used as a laydown and storage area. Within the southeast of the Site is a farm building noted as a Manure Store (on drawing 120932-NRG-DWG-0401). Along the north and eastern boundaries of the Site there is an earthen bund comprising soil with inclusions of demolition material. Anecdotal evidence suggests this bund was moved to the current location in late 2018 from a location within the Site. Bounding the Site to the south are numerous farm buildings, typical of the wider farm which lies to the southeast. Directly west of the Site is a small pond. Surrounding the Site to the North and East is arable farmland.

2.2 Site Walkover

A Site walkover was undertaken in May 2018 and a selection of representative photographs with associated comments is provided below. No invasive species were noted on or in the vicinity of the Site during the walkover.

2.3 Site History

2.3.1 General

The history of the Site has been reviewed using historical Ordnance Survey maps and available online resources dating from 1873 to the present day (included in ***Appendix A***).

From the first published map edition in 1874 the Site is shown to be in a rural area divided by field boundaries. The small pond lies directly east of the Site. A small track running from northwest to southeast lies close to the northeast of the Site. Approximately 130 m north of the Site lies a small stream flowing east, 100 m north from this lies a second stream also flowing east.

The Site and surrounding areas remained predominantly unchanged until 1937 when the track to the northeast of the Site has been repositioned to follow the route of the field boundaries.

The Site and surrounding land remained predominantly unchanged until 1984 when Knoxbridge farm is recorded 100 m to the southeast. The next available mapping CIRA 1991 shows the farm has expanded east, to within 100m of the Site. The final map provided from Envirocheck, dated from 2006 notes the farm has expanded again to immediately south of the Site boundary.

Current mapping notes further development on Site, a large farm building (Manure Store) is shown within the southeast corner of the Site, see Drawing 120932-NRG-DWG-0401.

2.4 Historical Reports

The following reports were made available to Sweco.

Wardell Armstrong designed and delivered a geotechnical lead ground investigation (GI) at the Site for Rika Biofuels in 2014. GI works were undertaken by Chelmer Site Investigations.

- Factual Report, Chelmer Site Investigation 31 October 2014 included within **Appendix C** of this document;
- Knoxbridge Farm: Interpretation of Ground Investigation, Wardell Armstrong, reference AS/ST14236/001, dated 20 April 2015; and;
- Envirocheck Report, Knoxbridge Farm, ST14236, Ref 61411968_1_1, dated 23/10/2014, for Wardell Armstrong.

The following subsections provide a brief overview of the findings of the first two reports. The Envirocheck report has been used as a source of relevant environmental data on the Site, where possible publicly available records have been used to verify the content of the Envirocheck.

2.4.1 Chelmer Site Investigation, Factual Report, 31 October 2014

Chelmer's ground investigation comprised five window sample boreholes to depths of 2 – 5m, undertaken on 31 October 2014. The factual report has no introductory text and has a site plan which is not to scale. The exploratory hole logs do not contain coordinates or levels. It appears that the holes covered a limited area in the southwest of the site. Testing is limited to Standard Penetration Tests in the holes, four moisture content tests, four Atterberg Limits tests, and six suites of analytical testing. Standpipes were installed in three of the holes but were not monitored by Chelmer or Wardell Armstrong after the date of installation; the data from that date comprises groundwater levels, but no gas monitoring.

The investigation encountered made ground in all locations, ranging from 0.25 m to 3.0 m thick. Made ground consisted of 'Type 1' material and gravelly clays. Beneath the made ground, the investigation encountered light brown firm to stiff silty Clay proven to a depth of 5 m. Groundwater was recorded during drilling at depths between 0.8 and 4.35 mbgl. No visible or olfactory evidence of contamination was noted within the logs.

2.4.2 Wardell Armstrong, April 2015, Knoxbridge Farm: Interpretation of Ground Investigation

The report summarised information from Chelmer's intrusive ground investigation conducted upon part of the current Site. At the time the digester was to be placed at 3mbGL, tough the site layout at the time is not known to Sweco.

2.5 Anticipated Ground Conditions

Anticipated geological and hydrogeological conditions within the Site were established using extracts from the online 1:50,000 scale geological mapping, and the Hydrogeological Map of England and Wales (1:625,000).

2.5.1 Artificial Deposits

Artificial deposits are not identified on the geological maps. However, as previously stated in Section 2.4.2, made ground has been identified in previous site investigation on Site.

2.5.2 Drift Geology

The geological maps do not note any superficial materials beneath the Site. Less than 100 m the north river alluvium deposits associated with the unnamed streams are recorded.

Approximately 200 m to the southeast of the Site, river terrace deposits consisting of sands and gravels are noted. Previous investigations on Site have identified silty clays to underly the Site.

2.5.3 Solid Geology

The geological maps note that the Weald Clay Formation underlay the Site. This formation consists of Mudstones sequences. Previous investigations have not identified the depth to solid / competent rock on Site.

2.5.4 Mining

The Envirocheck report held within **Appendix A** notes that the Site does not fall within a Coal Mining reporting area. The report also notes the Site does fall with an area of Non-Coal Mining Activity area, however it notes that there is highly unlikely to be a risk to the Site.

2.5.5 Hydrology

Publicly available maps show no drains or watercourses across the Site.

A pond is located <20 metres to the west of the Site which is known to be connected an unnamed surface water (stream) approximately 100m north of the Site. The stream flows east before joining with a second stream 1 km northeast of the Site. This stream then flows north before meeting the River Beult 3 km northeast of the Site. No information is available on the water quality of these unnamed streams from online sources or the Envirocheck report.

The nearest recorded discharge consent was located 347 m to the south of the Site.

2.5.6 Hydrogeology

The Hydrogeological Map of England and Wales (1:625,000 scale, 1988) shows that the underlying geology of the Site is generally impermeable and is mostly without groundwater except at shallow depths. Thick clays with subordinate sandstones and limestones are considered to yield water for domestic supplies but is of generally poor quality.

The Envirocheck report notes that the Weald Clay bedrock beneath the Site is an unproductive stratum and that there is no superficial aquifer. The Envirocheck report notes that the bedrock is a Non Aquifer which is negligibly permeable.

There are no recorded ground water abstraction licence held within 1 km of the Site.

2.5.7 Radon

The Radon Map of England and Wales published by the Health Protection Agency in conjunction with the British Geological Survey in 2011 was consulted in order to determine the potential risk from Radon at the Site. The Site is indicated to be in an area of elevated radon potential. With 3-5% of homes above the action level.

2.5.8 Unexploded Ordnance

A review of the online unexploded ordnance risk maps supplied by Zetica, has been conducted. The report notes that the farm lies along the boundary between low and moderate risk, therefore it has been considered to be of moderate risk. A Zetica report is held within **Appendix A**.

2.5.1 Environmental Designations

The Environment Agency's MAGIC map[1] was accessed on 22nd April 2019. The Site is shown to be located in a Site of Special Scientific Interest (SSSI) and therefore it is expected that Natural England will be a statutory consultee.

2.6 Desk Based Conclusions

2.6.1 General

This section summarises potential geotechnical and contamination issues that require intrusive investigation, based on the findings of historical research and a review of environmental and geographical data. As is standard UK best practice, potential contamination issues have been assessed through the development of an Initial Conceptual Site Model.

2.6.2 Potential Historical Contamination Sources

Central to the assessment of potentially Contaminated Land, as is defined in the 1990 Environmental Protection Act, is the concept of a Significant Pollutant Linkage, i.e. a significant connection between the source of contamination and a sensitive receptor via an appropriate environmental pathway. The degree of significance of a pollutant linkage depends on a number of factors including the hazardous nature of the source, the type of pathway (such as dermal contact with contaminants in soils), and the sensitivity of the receptor.

Having reviewed and considered the relevant historical features and environmental data, their proximity to the study Site, the local topography and likely surface and groundwater flow direction,

[1] https://magic.defra.gov.uk/MagicMap.aspx

sources of potential contamination associated with the proposed end use have been identified that require further consideration; these are presented in the following table.

TABLE 2-1: POTENTIAL HISTORICAL CONTAMINATION SOURCES

Source	Description	Distance
1	Made ground associated with the construction of historical farm buildings	On Site
2	An earthen bund located on the north and east of the Site with inclusions of demolition materials.	On Site

TABLE 2-2: POTENTIAL CONTAMINATION RECEPOTORS

Receptors	Description	Distance
1	Construction workers and suture site users (e.g. plant operatives)	On Site
2	Surface Water – Pond	<20 m west of the Site
3	Surface Water – Unnamed streams	100 m north of the Site

2.6.3 Geotechnical

The available ground investigation data from Chelmer's 2014 investigation is lacking in that (a) it does not cover the whole site, (b) the depth of the holes is inadequate, (c) the standpipes were not monitored for gas, (d) the standpipes were not monitored for groundwater after the date of installation, (e) the types of geotechnical testing are limited, (f) the volume of geotechnical laboratory testing is miniscule, and (g) the extent and volume of analytical testing is inadequate.

The following potential geotechnical issues associated with the proposed end use have been identified.

- Insufficient coverage of the areal extent of the site.
- Insufficient information on the depth, nature and extent of the underlying made ground, natural drift and solid geology at the Site.
- Unknown geotechnical properties of the underlying natural soils and rock.
- Insufficient monitoring of groundwater levels.
- The potential for the natural soils or any made ground to be chemically aggressive towards concrete.

3. Ground Investigation

3.1 Rationale

A desk based review of available ground conditions information confirmed the requirement for an intrusive Ground Investigation to further develop the conceptual site model. Soil samples were selected to characterise the chemical nature of the Site with respect to potential human health, infrastructure and environment risks. Shallow and deep boreholes were drilled to allow near surface and deeper ground gas and groundwater monitoring. Further details of the contamination investigation rationale are described below. Rotary boreholes were targeted along the north and west of the Site to prove rock head depth and to provide deeper borehole monitoring locations.

3.1.1 Contamination Investigation

Soil samples from trial pits and cable percussive boreholes were selected to give Site wide coverage and to target potential sources of contamination. Trial pits and soil sampling was also undertaken to assess materials forming an earthen bund located along the north and east of the site. Soil samples were selected for chemical analysis based on any visual or olfactory evidence of contamination and to provide general Site wide coverage.

3.2 Works Undertaken

Table 3-1 shows the works which were undertaken in order to address the investigative requirements. Drawing 120932-NRG-DWG-0404-X0 shows the location of the Site investigation positions.

All soil samples were collected in accordance with BS10175 and dispatched to Jones Environmental Laboratory, and where available the analysis was UKAS accredited.

TABLE 3-1: GROUND INVESTIGATION WORKS UNDERTAKEN

Category	Item	No.
Cable Percussive Boreholes	BH01 – BH08, including BH06A and BH06B	10
Trial pits	TP01 – TP08 and TP08A	9
Trial pits to sample a bund of stockpiled material	TP12 – TP21	10
Gas and Groundwater Monitoring	Standpipes installed in BH01, BH03, BH04 and BH08	3 rounds
Geotechnical Laboratory & Field Analysis	Natural Moisture Content (nmc) determinations	86
	Atterberg Limit tests	21
	Particle size distribution (PSD) tests	11
	Dry density / moisture content relationship (“compaction”) (2.5kg) tests	4
	California Bearing Ratio (CBR) tests	4
	Moisture Condition Value (MCV) at natural moisture content	10 *
	Moisture Condition Value (MCV) “Calibration” tests	1
	“Quick” unconsolidated undrained triaxial tests	5
	One dimensional consolidation (oedometer) tests	4
	BRE SD1 Suites	5
	Standard Penetration Tests (SPT) in boreholes	46
	Hand shear vane tests on borehole and trial pit samples	45

Environmental Laboratory Analysis	Soil Analysis	23
	Soil Leachate Analysis	14
	Groundwater Analysis (including one duplicate)	5

* 1 result outstanding at time of reporting

3.3 Encountered Ground Conditions

The following section summarises the ground conditions recorded during the two ground investigations. Further ground conditions observations and descriptions pertinent to the contamination and geotechnical assessments are presented in the subsequent sections of this report.

3.3.1 Made Ground

Made ground was encountered across the Site to a maximum thickness of 2m (in WS2 which did not penetrate beyond the stratum). The substrata of made ground are described in the following table. The made ground appeared in four forms:

- Type 1 – a covering adjacent to the existing development as encountered in the limited area of the Chelmer investigation;
- General made ground comprising local soils with a fraction of anthropogenic mater;
- Reworked local soils beneath the Type 1 and general made ground, with anthropogenic matter being absent; and
- The bund of stockpiled materials which was relocated from north of the existing farm buildings to outside of the proposed development area in late 2018. It is thought that the bund arose during previous development work at the site.

TABLE 3-2: MADE GROUND

Strata	Description	Vertical Distribution	Lateral Distribution	Thickness (approx.)
Type 1	Type 1	At site surface. Overlain by 0.05m concrete in WS2.	Encountered in the 2014 GI in the southwest of the site adjacent to the existing farm buildings	0.15 – 1.6m
General made ground	As per the local soils (Weald Clay) with a varying fraction of anthropogenic matter, principally fragments of brick, concrete, clinker and ash.	At site surface or beneath Type 1	Across most of the site	0.15 – 1.8m
Reworked local soils	As per the local soils (Weald Clay) with no anthropogenic matter reported	Beneath the general made ground	Encountered in many holes	0.35 - 1.3m
Bund stockpile	As per the local soils (Weald Clay) with a varying fraction of anthropogenic matter, principally fragments of brick; asphalt noted in TP18; clinker noted in TP20.	In the bund (TP12 – TP21)		N/A

Note that TP08 was terminated at 1.6m having encountered timber at 1.5m and black plastic bags filled with animal (chicken) remains. A trace of hydrocarbons was recorded in TP05 and TP06.

3.3.2 Drift Geology

Drift geological deposits were not encountered at the site.

3.3.3 Solid Geology

The Weald Clay was encountered in all those holes which penetrated below the made ground i.e. all holes except WS3, TP08 and TP08A. Borehole BH01 recorded weathered mudstone and mudstone. Trial pits TP01 – TP07 terminated in a gravel stratum, and TP05 also recorded an upper gravel stratum beneath the made ground and reworked strata.

TABLE 3-3: WEALD CLAY

Strata	Description	Vertical Distribution	Lateral Distribution	Thickness (approx.)
Weald Clay	Typically firm to stiff brown / grey (slightly) sandy (slightly) silty CLAY, becoming stiff and very stiff bluish grey slightly silty CLAY with depth. Sometimes described as laminated in TP01 – TP06.	Beneath various made ground deposits. Encountered from 0.3/2.2 – 2.8/10.76mbgl	Encountered in all holes which penetrated the made ground	Maximum 9.26m proven
Gravel (upper)	Brown and black subangular to subrounded fine to coarse mudstone and flint GRAVEL	Encountered between made ground and Weald Clay at 1.6 – 1.9mbgl	In TP05	0.3m
Gravel (lower)	Grey (and orange) (clayey) subangular fine to coarse mudstone (and flint) GRAVEL (with oxidation layers)	At the base of trial pits from 2.8/4m to the end of the pits at 4-4.5mbgl	Recorded across the site in trial pits	0.4 – 1.5m, maximum proven
Weathered Mudstone	Weathered mudstone recovered a stiff to very stiff light grey slightly sandy slightly silty friable CLAY. Sand is fine.	At 4.3 – 11mbgl	In BH01	6.7m proven
Mudstone	Grey mudstone	At 11 – 11.76mbgl (end of borehole)	In BH01	0.76m proven

Note that cable percussion boreholes do not necessarily prove solid or competent rock, and that the cable percussion rig was able to penetrate 6.7m into the weathered mudstone in BH01 and a further 0.76m into mudstone (having chiselled 0.3m in one hour and terminated with a Standard Penetration Test which penetrated 255mm).

3.3.4 Groundwater

The nine trial pits were dry for the short duration they were open. Borehole BH07 was dry when formed. All other boreholes in the two ground investigations encountered groundwater. Water was encountered at depths of 0.45 – 8m in those boreholes, with two holes also recording second deeper strikes at 10.6m and 11m.

Monitoring of groundwater in standpipes revealed water levels as high as 0.25 – 1.59m in the four standpipes installed in the 2019 ground investigation.

During the 2019 ground investigation there was ponded water on the surface which caused some holes to be relocated.

Note that the investigations and limited monitoring of the standpipes may not have revealed the true groundwater profile, and that seasonal variations and fluctuation in the water table may occur.

3.3.5 Contamination Observations

Other than the logged made ground which generally contained brick, observations of asphalt, ash, and/or clinker were recorded in locations BH01, BH02, BH03, BH04 BH06B, BH08, TP02, TP03, TP04, TP07, TP08, TP08A, TP15, and TP20. TP15 and TP20 were located in the earthen bund.

Traces of hydrocarbons were noted in TP05 at 0.50m and 1.50m bgl, and in TP06 at 0.5m bgl,

Timber and plastic bags containing animal remains were recorded in TP08 from 1.50m and TP08A from 0.8, bgl. Both pits were abandoned upon encountering these materials and therefore the depth of the remains was not confirmed.

No visual evidence of asbestos containing materials was recorded, and no visual or olfactory evidence of contamination was recorded during gas and groundwater level monitoring.

3.4 Contamination Investigation

3.4.1 Chemical Analysis

Samples were selected for chemical analysis to assess potential contamination risks to Human Health and Controlled Waters. Testing comprised a suite of contaminants established from the desk based assessment to potentially be present within the Site.

The Site is proposed for industrial development. The soil analysis results have been screened against conservative Tier 1 criteria for commercial end use, using the most suitable conservative Category 4 Screening Levels (C4SL) for 1% Soil Organic Matter (SOM) values.

Due to the proximity of the pond <20m to the west of the Site, which is known to be connected to the stream approximately 100m to the north, soil leachate and groundwater results have been screened against the UK Water Framework Directive (WFD) Values to assess the potential risks to Controlled Waters.

Screened chemical analysis results and further details of the screening are given in ***Appendix F***.

3.4.2 Gas Monitoring

4 No. boreholes within the Site were installed with combined gas/groundwater monitoring installations, all boreholes were screened into the made ground and drift deposits. Gas and groundwater level monitoring has been undertaken on three occasions, with groundwater samples taken on one occasion.

The gas monitoring results have been assessed in accordance with CIRIA C665: Assessing risks posed by hazardous ground gases to buildings, which proposes that ground gas risk assessment should be based on the concept of a Gas Screening Value (GSV). The calculated worst case GSV (measured in litres of hazardous gas per hour) is based on the maximum flow and carbon dioxide/methane concentrations identified during monitoring, which is used to define a Characteristic Situation (CS) for a Site. CS1 indicates that no protection measures are required, whereas CS6 indicates that development should not proceed without remediation.

The monitoring results and further details of the screening and assessment methodology are given in ***Appendix G***.

3.4.3 Assessment Methodology

The investigation and interpretation includes development of a conceptual site model and subsequent risk assessment, and has been undertaken in accordance with relevant guidance documents, including CLR 11: Model Procedures for the Management of Contaminated Land, BS10175: Code of Practice for Investigating Potentially Contaminated Land, and CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice. Full details of the assessment are provided in subsequent sections of this report.

3.5 Geotechnical Investigation

Sampling for geotechnical analyses and in-situ testing within boreholes was undertaken in line with the UK Specification for Ground Investigation, Section Edition (ICE Publishing, 2012 (the “Yellow Book”)) standard sampling frequency and testing guidelines. Geotechnical analysis has been undertaken in order to investigate the suitability of the existing ground conditions for the proposed development, to determine geotechnical parameters for design, and to assess the suitability for reuse of soils within the Site.

For the purposes of summarising geotechnical laboratory test data, the strata encountered have been subdivided into five types on the basis of visual descriptions. These are Type 1, Made Ground, the bund stockpile, the Weald Clay, the weathered mudstone. The engineering properties of these materials are detailed in the tables provided in ***Appendix B***.

4. Contamination Assessment

The following section presents an assessment of the investigation data with respect to human health and the wider environment, including the water environment, and buildings & structures.

4.1 Conceptual Site Model

Central to the assessment of potentially Contaminated Land, as is defined in the 1990 Environmental Protection Act, is the concept of a Significant Pollutant Linkage, i.e. a significant connection between the ***source*** of contamination and a sensitive ***receptor*** via an appropriate environmental ***pathway***. The degree of significance of a pollutant linkage depends on a number of factors including the hazardous nature of the source, the type of pathway (such as dermal contact with contaminants in soils), and the sensitivity of the receptor. The first step towards understanding potential pollutant linkages at a site is through the development of an ***Initial Conceptual Model***. A conceptual model is defined in BS10175 as: "*a textual and/or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information from the preliminary investigation and refined during subsequent phase of investigation and which is an essential part of the risk assessment process*".

The following assessment is qualitative, in that professional value judgments have been applied to the available Site data in order to assess levels of risk. The framework for these assessments is set out in CIRIA C552, "Contaminated Land Risk Assessment, A Guide to Good Practice". This guidance states that the assessment of risk should be based on both the likelihood of an event and the severity of its potential consequences. One of the following six risk levels has been assigned to each potential pollutant linkage identified: Very Low, Low, Low/Moderate, Moderate, High and Very High. A risk of Low/Moderate or above indicates that further assessment, investigation or possibly remediation will be required.

The Site is planned for industrial development comprising an Anaerobic Digester (AD) plant. The following assessment is intended to inform understanding of potential contamination liabilities with the Site in its current use (i.e. an assessment with respect to Part 2a of the Environmental Protection Act 1990) and with respect to its future proposed use.

4.2 Human Health

The majority of the Site currently comprises of an open agricultural field, with an earthen bund located on along the northern and western boundaries, and a warehouse type structure with concrete yard on the south of the Site. Areas of made ground fill were encountered across the Site which generally comprised natural re-worked soils, some with varying fractions of anthropogenic matter, principally fragments of brick, concrete, clinker and ash.

Future construction workers, plant operatives, and neighbouring site workers are considered to be potential receptors.

4.2.1 Direct Contact / Ingestion / Inhalation

Soils results have been screened against Tier 1 values to be protective of a commercial land use scenario. The chemical analysis results are included in ***Appendix E***.

The results of soil analytical testing and the subsequent screening of the results against the appropriate Tier 1 criteria did not record any exceedances of the Tier 1 criteria within the ground or the bunded material. However, asbestos was identified in three samples (TP12 0.8m, TP16 1.0m and TP19 1.0m) within the earthen bund. Asbestos was identified to be chrysotile asbestos fibre bundles, with subsequent quantification of less than <0.001% (i.e. at trace levels). Due to the presence of asbestos in materials at the surface which are open to the air and therefore have the potential to dry and dust, there is a potential risk to human health from these materials.

Overall revised risk (current use): ***Moderate***
Overall revised risk (future use): ***Moderate***

4.2.2 Ground Gas

The maximum concentration of carbon dioxide and methane recorded was 0.8% and 0.1% respectively. A minimum oxygen concentration of 20% and maximum positive flow rate of 0.1 l/hr was recorded.

Screening of the shallow gas data set in accordance with the CIRIA Guidance identifies a worst-case gas screening value of <0.008 l/hr (equivalent to a characteristic gas situation CS1) for the boreholes.

The results of the gas monitoring are provided in ***Appendix D*** with the screened results provided in ***Appendix G.***

Overall revised risk (current use): ***Low***
Overall revised risk (future use): ***Low***

4.3 Water Environment

Groundwater within made ground and shallow superficials is considered by the Environment Agency as a Non Aquifer, and the site is not located within a ground water source protection zone, therefore groundwater is not considered to be a receptor in these assessment works. The primary Controlled Water receptor is a pond which is located <20m to the west of the Site which has been identified to discharge into an unnamed stream approximately 100m to the north of the Site.

The presence of natural superficial clays underlaying the Site which sit upon the impervious Weald Clay formation make the risk to a groundwater environment negligible and therefore risk to groundwater has not been investigated further.

4.3.1 Soil Leachates

Ground Conditions

A total of eight soil samples were taken from below ground level and scheduled for soil leachate testing. The following exceedances of Tier 1 Screening criteria for the protection of surface water were recorded: copper (1 No. sample), nickel (1 No. sample), mercury (1 No. sample), ammoniacal nitrogen (2 No. samples), fluoranthene (2 No. samples), anthracene (1 Sample) and benzo(a)pyrene (2 No. samples). Exceedances were generally marginal, with the exception of the sample from TP8 at 1.0 m bgl which recorded concentrations several orders of magnitude greater than the screening value, however TP8 is located on the east of the Site and is over 100m from the closest surface water receptors (pond to the west, stream to the north).

The presence of elevated concentrations of contaminants within the made ground across the Site indicates a potential risk to surface water in the current site layout, however the construction of the AD plant, access roads and low permeability yard areas will reduce the infiltration of rain water and consequently reduce the potential for soil leaching.

Overall risk (current use): ***Low***
Overall risk (future use): ***Low***

Bunded Materials

A total of five samples were scheduled for soil leachate testing. The following exceedances of Tier 1 Screening criteria for the protection of surface water were recorded as follows: Copper (3 No. Samples) and Fluoranthene (1 No. Sample). Exceedances were marginal.

Given the limited and marginal exceedances recorded within leachate from the bund materials, it is considered that there is a low risk to surface water from this material in its current location.

Overall risk (current use): ***Low***
Overall risk (future use): ***Low***

4.3.2 Groundwater

One round of groundwater monitoring was conducted on the 5th March 2019 as part of the site investigation. Five samples were collected in total from BH01A, BH01B, BH03, BH04 and BH08. The following exceedances of Tier 1 Screening criteria for the protection of surface water were recorded: copper (1 No. sample), nickel (1 No. sample), zinc (5 No. samples), sulphate (4 No. samples), ammoniacal nitrogen (4 No. samples), electrical conductivity (3 No. samples), naphthalene (1 No. sample), fluoranthene (2 No. samples) and benzo(a)pyrene (1 No. sample).

The majority of exceedances are within an order of magnitude of the screening criteria. However, levels of sulphate within 4 of the five samples are more than an order of magnitude greater than the screening value. Elevated levels of sulphate and ammoniacal nitrogen within groundwater are synonymous with areas arable farming in which fertilisers are used, and therefore these contaminants are expected to be found in groundwater in the wider area.

Exceedances of copper, nickel, fluoranthene and benzo(a)pyrene correspond with exceedances of these substances within the soil leachate which indicates that contamination in the soils is leaching into groundwater. These exceedances were recorded in samples from BH04 and BH08 which lie approximately 10 metres (m) and 130m from the closest surface water (pond). The marginal exceedances observed within BH08 and the distance from the receptor limit the potential for these contaminants to migrate through groundwater to the surface water and therefore groundwater in BH08 is not considered to be a risk to Controlled Water. Due to the close proximity of BH04 to the closest surface water, groundwater in BH04 presents a potential risk to Controlled Waters.

Therefore, it is considered that there is a low to moderate risk to Controlled Waters.

Overall risk (current use): ***Low to moderate***
Overall risk (future use): ***Low to moderate***

5. Geotechnical Assessment

5.1 General

The proposed development is an anaerobic digestion plant whose layout is shown on drawing 120932-NRG-DWG-0401.

5.1.1 Anaerobic Digester

The primary and largest component is an anaerobic digester (item 03 on the propose site layout drawing) located at the northwest of the site. The manufacturer of the digester is DVO Inc. and details of the specific structure for "Green Create W2V Kent Ltd (Fridays)" are shown on DVO's drawings 00 to 20, dated 12/21/18.

The nominal dimensions of the digester are 64m by 44.83m, though a 20.77m by 6.13m AR System Aeration Pit and Effluent System is attached at one corner of the digester.

DVO's drawing 20 comprises structural notes, including the following. Where appropriate, Sweco comments are provided, in italics.

A. Loading criteria

A.1. Precast supplier responsible for determining snow load, live load, and dead load.

This may be somewhat contradicted by B.4.

A.2. Precast plank shall contain both top and bottom strands and be designed to withstand uplift force of 703.1kg/m^2 (.60894 bar).

B. Material strengths

B.4. Allowable soil bearing pressure … 190kN/m^2.

The term used is "pressure", which is assumed to mean the loading imparted by the structure into the ground (rather than the resistance or capacity provided by the ground).

The term "allowable" requires there to be an associated allowable settlement, otherwise "allowable soil bearing pressure" is a meaningless term. It has not been possible to obtain the allowable settlement from DVO. A value of 25mm total settlement has been assumed and requires acceptance from DVO.

C. Foundations

C.1. Actual soil bearing conditions shall be confirmed prior to construction, test results copied to DVO.

C.2. Provide sufficient temporary protection to prevent all exposed subgrade from freezing. Do not place concrete or backfill over frozen soil.

C.3. Keep accumulated rain water and surface runoff away from bearing stratum. Do not allow water to stand in the excavation and soften the soils at or below bearing level.

C.4. Base slab must bear on 150mm of compacted gravel.

C.5. Base slab must be a minimum of 750mm above water table.

Note that the highest recorded groundwater in the two ground investigations is at 0.25mbGL (BH04).

Note also that ponded surface water was observed during the 2019 ground investigation, causing a number of exploratory holes to be relocated.

I. Backfilling

I.1. Backfill material shall be Type 1 / made ground. Silty clay shall not be used as backfill.

The consequences of this are that:

(a) site won materials are not suitable for use as backfill; and

(b) Type 1 requires to be imported (a small quantity of existing Type 1 may be won on site provided that it has not become contaminated by fines, etc).

Note that DVO drawing 02 indicates "backfilled native soil … 2:1 maximum slope".

This is assumed to be horizontal : vertical.

I.2. Once the concrete is properly cured, 200mm of backfill can be paced around the tank prior to precast top being permanently fastened. Avoid backfill containing large rocks, hard or frozen soil lumps, or construction debris.

I.3. Earthfill shall be placed in 250mm lifts, prior to compaction. Backfill around structure gradually and uniformly around all sides of the structure. Compact soil to not less than 85% of maximum dry density according to ASTM D 698, Standard Procter (sic) Test.

I.4. Backfill height; 4400mm minimum, 4700mm maximum.

J. Construction compaction adjacent to structure

J.1. Do not operate heavy compaction equipment within 4000mm of the structures.

J.2. Do not operate compaction equipment equipment (sic), in excess of 6800Kg. between 2000mm and 600mm of the structures. Earthfill shall be placed in 200mm lifts (prior to compaction). Compact in a manner adequate to prevent damage and allow the structure to gradually and uniformly assume the backfill loads.

J.3. Compaction shall be accomplished by means of manually directed power tampers or plate vibrators within 600mm of structures. Earthfill shall be placed in 100mm lifts (prior to compaction). Compact in a manner adequate to prevent damage to the structure and allow the structure to gradually and uniformly assume the backfill loads.

K. Grading

K.1. The tank site shall be graded to provide drainage away from the tank at a minimum of 1% slope.

L. Operation

L.1. Day to day operation of heavy equipment is prohibited within 4000mm of permanent structure walls.

5.1.2 Other Features

Drawing 120932-NRG-DWG-0401 shows numerous other features elsewhere within the development at the site, including some which are to be located within the northernmost of the existing farm buildings. There are no details for these features other than their names and locations.

To the south of the northernmost of the existing farm buildings, an existing surfaced road is to be extended to include a turning head. Elsewhere within the site it is likely that surfaces will be required for vehicular access, though this and any details are not certain.

5.2 Summary of Ground Conditions

Ground investigation comprised cable percussion boreholes and trial pits across the site, plus a few shallow window sample boreholes in the southwest of the site in a previous ground investigation.

The ground conditions at the Site comprise made ground overlying deposits of the Weald Clay.

The made ground is 0.3 – 2.2m thick and generally comprises reworked local soils (the Weald Clay) with a varying fraction of anthropogenic matter such as brick, concrete and clinker fragments and ash. The previous ground investigation identified 0.15 – 1.6m of Type 1 in the southwest of the site, adjacent to the northernmost farm building, most likely placed as a surface for trafficking and laying materials. Anthropogenic matter is recorded in the made ground to depths of 0.3 – 2m. The surface of that part of the made ground comprising entirely reworked local soils was encountered at depths ranging from ground level to 1.2m, with the underlying natural strata encountered at depths of 0.8 – 2.2m. Quite why the local Weald Clay should be reworked to a typical depth of c.1.5m at such distance from the existing farm buildings is not understood, particularly as the land is fairly flat.

Note that an animal (chicken) carcass burial pit was encountered in a trial pit (TP08) and requires further investigation.

The upper surface of the Weald Clay was encountered at 0.3 – 2.2m, with the stratum proven to a maximum depth of 11.76m. The stratum is generally firm to stiff (sandy) silty Clay, becoming stiff and very stiff with depth. Trial pits recorded (clayey) gravel of mudstone and flint below c.3 – 4m, and beneath the made ground in one case. Borehole BH01recorded weathered mudstone at 4.3 – 11m, then mudstone to the end of the hole at 11.76m.

A bund of stockpiled materials was present immediately north of the existing farm buildings and was relocated to the east of the proposed development site in early 2019. The material is thought to have accumulated with the progressive development of the existing farm. The material is the local Weald Clay with a varying fraction of anthropogenic matter, principally brick fragments.

While trial pits were dry in the short durations they were open, groundwater was encountered in all but one borehole, at depths of 0.45 – 8m, with two boreholes recording second water strikes at 10.6m and 11m. Monitoring of standpipes revealed water levels as high as 0.25 – 1.59m. Five boreholes recorded water within 1m of surface. During the 2019 ground investigation there was ponded water on the surface. The monitoring may not have revealed the true groundwater regime; seasonal fluctuations may occur. The groundwater level is assumed to be at surface.

5.3 Building Foundations – General

The made ground, including reworked local soils, is not a suitable founding stratum due to its inherent variability and anticipated poor engineering characteristics.

Assessment of the anaerobic digester and other structures should include, where appropriate:

(i) Loadings in the tank empty and tank full scenarios, including for those structures where several tanks may be placed on one (raft) foundation e.g. item 17, six ammonium sulfate storage tanks;

(ii) Uplift due to the high groundwater table;

(iii) Total settlement;

(iv) Differential settlement within a structure;

(v) Differential settlement between structures which are linked by conveyor belts, rails, rigid pipelines and the like; and

(vi) Those structures where overturning and sliding may be of more concern than bearing resistance e.g. while the height of the flare (item 01) is not known, it is possible that the vertical loading may be modest for this structure, and that preventing the stack from toppling may be the more onerous founding criterion.

Note that granular fills placed beneath ground surface may effectively act as sumps for water due to the comparative lack of permeability of the surrounding strata.

5.4 Anaerobic Digester Foundations

DVO requires the structure to be placed 750mm above the water table. It is understood that the digester is to be placed at or near surface level to prevent contact between the structure and groundwater.

5.4.1 Assumptions

The Digester Groundwater Issues Technical Memorandum (120488-NRG-DOC-502) notes that 190kN/m^2 bearing capacity will be achieved at 3m below EGL. The options in the memo accordingly all assume a requirement for dig out and replace with well compacted stone to 3m bgl. This appears to originate from the Wardell Armstrong Interpretation Report, which advises that the design of strip foundations or thickened edge raft foundations may be undertaken assuming a net allowable bearing pressure of 190kN/m^2. The Wardell Armstrong Interpretation Report assumes the digester to be founded at 3m bgl, however, this appears to be based on the understanding that this was the intended arrangement at the time, and the allowable bearing pressure of 190kN/m^2 seems to be independent of founding level. The allowable bearing pressure stated appears to be derived from the simplified "presumed bearing resistance" method. This approach is typically conservative; however, it does not include an assessment of the long-term "drained" soil conditions, which can be the worst-case condition.

A review of the ground conditions and a more detailed assessment of bearing capacity are summarised below.

5.4.2 Ground Conditions

The borehole logs from the Central Alliance 2019 ground investigation show the ground conditions to comprise variable made ground to approximately 1.5m bgl, underlain by firm to very stiff clay (considered to be completely weathered mudstone). In borehole BH01, intact mudstone is noted from 11m bgl, with the borehole showing refusal at 11.76m bgl, and BH6B shows refusal at 10.76. A generalised ground model is shown in the table below.

TABLE 5-1: GENERALISED GROUND MODEL

Strata	Geology	Depth (mbgl)
MADE GROUND: Variable CLAY with gravel of flint, brick, sandstone, asphalt and clinker	Made Ground	GL to 1.5m
Firm to very stiff CLAY (completely weathered mudstone)	Weald Clay Formation	1.5 to 11.0m
Intact MUDSTONE	Weald Clay Formation	11.0 to 11.76m (proven depth)

It should be noted that trial pits TP1 and TP4, which were located near to the digestor location, show bands of gravel of mudstone and flint to be present below 3.2m bgl and 3.5m bgl respectively. This band of granular material is not shown in the borehole logs and has not been included in the generalised ground model. However, its potential presence should be noted as a risk for temporary works, should excavations extend to such depths, as it may allow rapid water ingress into excavations, resulting in a requirement for groundwater control.

5.4.3 Soil Parameters

An assessment of bearing capacity and predicted settlement has been undertaken. The soil parameters derived for use in these calculations are presented in the following table.

Due to the potentially variable nature of made ground, it is not advisable for the structure to be founded on this stratum. Therefore, soil parameters have only been derived for the firm to very stiff clay (completely weathered mudstone).

TABLE 5-2: SOIL PARAMETERS

Parameter	Value #	Derivation / Reference
Unit Weight (kN/m^3)	20	BS 8004: 2015 – Figure 2
Angle of Friction, φ' (degrees)	23	Correlation with Plasticity Index (PI) BS 8004:2015 – equation 8).
Undrained Shear Strength, c_u (kN/m^2)	= 50 + 15 z	Correlation with Standard Penetration Test (SPT) "N" value. (Stroud, M and Butler, F, 1975, "The Standard Penetration Test and the Engineering Properties of Glacial Materials", Conference on the Engineering Behaviour of Glacial Materials, Birmingham.)
Drained Stiffness, E' (MN/m^2)	= 10 + 3.5 z	
Undrained Stiffness, E_u (MN/m^2)	= 12 + 4.3 z	
Coefficient of Volume Compressibility, m_v (m^2/MN)	= 0.12 – 0.007 z	
# where z is depth, m bgl		

5.4.4 Foundation Assessment

As noted above, it is recommended that the structure is not founded on Made Ground. Therefore, the following assessment of bearing capacity and settlement are based on the assumption that the made ground, present to c.1.5m bgl, will be excavated and replaced with well compacted granular material, and the structure will be founded at surface level above this.

The maximum design load of 190kPa is anticipated to occur only under the central walls of the digester, for a width of approximately 1.2m. Therefore, the foundation has been treated as a strip footing, 1.2m wide by 64m long, with an applied pressure of 190kPa.

The design load outside of these areas is understood to be in the region of 50 – 60 kPa, which is not considered to represent the critical design case with respect to bearing capacity but is given consideration in settlement analyses.

It is assumed that the full load in the high load areas comprises dead load only, and that there are no horizontal forces or moments applied.

5.4.5 Bearing Capacity

Design bearing capacity was assessed by confirming that the design bearing resistance of the in-situ firm to very stiff clay below the made ground is greater or equal to the design vertical unfavourable actions.

Bearing resistance was assessed using Terzaghi's method. Bearing capacity, foundation shape and load inclination factors were assumed as presented in Annex D of BS EN 1997-1: 2004. Bearing capacity was assessed assuming both short-term undrained and long-term drained ground conditions, with Eurocode 7 Design Approach 1, Combination 2 factors applied. Based on experience it is judged that Design Approach 1, Combination 2 shall be the critical design case over Combination 1, therefore only Combination 2 has been verified.

The pressure applied to the clay has been calculated by assuming a spread of load from the internal walls of the structure, through the granular fill used to replace the made ground at a gradient of the 1:2 (Horizontal : Vertical).

The results of the bearing capacity assessment are presented in the following table.

TABLE 5-3: RESULTS OF BEARING CAPACITY CACULATIONS

Analysis	DA1-Combination 2		
	Vertical Actions	Bearing Resistance	Degree of utilisation
	(kN/m^2)	(kN/m^2)	
Undrained Case	128	371	34%
Drained Case	128	309	41%

The results indicate that design bearing resistance is greater than design bearing pressure.

5.4.6 Settlement

Immediate and consolidation settlement beneath the digester has been assessed to determine if the calculated magnitude of total or differential settlement indicates a likely serviceability failure.

Immediate settlement was calculated by the "adjusted elasticity" method for average settlement beneath a flexible footing, and consolidation settlement was calculated by the one-dimensional stress - strain m_v (oedometer) method.

Anticipated settlement has been calculated using two approaches, as described below.

Case 1 – Foundation treated as a strip footing, 1.2m wide with a load of 190kPa applied to model the maximum load applied at the central walls of the digestor.

Case 2 – Foundation treated as a raft, 44.8m by 64m, with an applied load of 60kPa to model the settlement of the digestor as a whole.

The magnitudes of calculated settlement for the two approaches are presented in the tables below.

TABLE 5-4: RESULTS OF SETTLEMENT CALCULATION – CASE 1

Net increase in pressure below internal walls of digester	SLS		
	Immediate settlement	Consolidation settlement	Total long-term settlement
(kN/m^2)	(mm)	(mm)	(mm)
190	4	6	10

TABLE 5-5: RESULTS OF SETTLEMENT CALCULATION – CASE 2

Typical net increase in pressure below base of digester	SLS		
	Immediate settlement	Consolidation settlement	Total long-term settlement
(kN/m^2)	(mm)	(mm)	(mm)
60	3	21	24

For both analysis approaches, the total long-term settlement was calculated to be less than 25mm below the digester. This is considered to be sufficiently small to prevent SLS failure based on the tolerance of the connecting duct work.

5.4.7 Recommendations

The made ground present to approximately 1.5m bgl is not considered to be a suitable bearing stratum for the digestor, therefore it is recommended that the made ground is excavated and replaced

with well compacted acceptable granular material. A material compliant with Class 6N or 6P structural fill in accordance with the Specification for Highways Works (SHW) would be suitable.

Consideration of bearing and settlement indicates that the in-situ firm to very stiff Weald Clay below the made ground is likely to be sufficiently competent to provide the required bearing capacity and to limit settlements at 1.5m bgl, without a need for further dig-out and replacement, provided the stratum is encountered by that depth.

It is recommended that an experienced ground engineering professional inspects the exposed sub-formation (firm to stiff clay) prior to backfilling to confirm that the strength and consistency of the founding stratum is in accordance with the design assumptions.

5.5 Foundations for Other Proposed Structures

Structural details, loadings and criteria (e.g. allowable settlement) are not available for the numerous other structures required for the development. Therefore, it is not possible to speculate on the adequacy of the strata at the site as founding strata for the structures (noting that bearing capacity is a function of foundation details (e.g. shape, dimensions, depth) in addition to properties of the founding stratum).

General guidance applies as before e.g. the made ground (including reworked natural strata) is not a suitable founding stratum, uplift should be considered for those structures placed beneath existing levels.

Once structural details including loadings are available for these structures it will be possible to address their founding conditions on an individual basis.

5.6 Foundations of Existing Farm Building

The northernmost existing farm building is to be re0-used within the proposed development. Details of its foundations are not known.

5.7 Ground Aggressivity

Chemical test data is available and has been assessed after the recommendations of Building Research Establishment (BRE) Special Digest 1 (SD1). It is noted that the Weald Clay may potentially contain pyrites.

Consideration of the data indicates that Design Sulfate Class DS–2 and Aggressive Chemical Environment Class AC–2 apply to the Site. The available testing does not indicate the presence of pyrites.

Nevertheless, existing made ground and disturbed ground should be removed from within proximity (0.5m) of any proposed buried concrete, metal, or other potentially sensitive elements of the works such as pipework.

5.8 Roads and Tracks

The existing road immediately south of the northernmost farm building is to be re-used and not modified.

Elsewhere within the site a surfacing of Type 1 is to be provided.

Prior to placing the Type 1, the surface should be levelled and prepared, including the removal of any unsatisfactory materials such as soft spots and artificial matter. It would be prudent to place a geotextile separator on the surface prior to placing the Type 1 to prevent stone from punching into the (clay) surface under compaction or trafficking. The thickness of the Type 1 layer will be dependent on the anticipated vehicular loads. Should the loads be great or should the clay surface be made ground or reworked ground, then it would be prudent to also use a geogrid as basal reinforcement for the Type 1 materials. It would also be prudent to avoid vibratory compaction of the stone, in recognition of the high groundwater table at the site.

5.9 Earthworks

It is assumed that the site will more or less be at existing levels, the surface being prepared to be level or to have a gentle fall. It is understood that this platforming exercise will yield shallow slope angles. Hence, slope stability is not a concern provided the slopes are formed of suitable materials, compacted where appropriate.

Site won materials will be made ground, including some existing Type 1, and the Weald Clay. The made ground may largely be reworked Weald Clay with some artificial matter.

There is no requirement for earthworks materials or fills on site other than granular material for placement beneath structures. The granular fills require to be imported.

The site won materials will be suitable, geotechnically, as landscape fills. However, as noted, DVO's drawing 20 states that the backfill to the AD tank shall be Type 1 / made ground, and that silty clay shall not be used as backfill. Contradicting this, DVO's drawing 02 indicates "backfilled native soil … 2:1 maximum slope". For compacted material to stand at this (maximum) slope angle, respectable engineering properties are required. Note that the location of the materials against the AD tank is such that compactive effort would be limited.

In all cases, prior to reuse of any material on Site, consideration should be given to the results of chemical analytical testing which are discussed elsewhere in this report.

5.10 Site Clearance, Excavations and Groundwater

There is little requirement for Site clearance. A Phase 1 earthworks operation has moved a bund of stockpiled materials away from the required working area.

Topsoil strip and minor vegetation clearance may be required, though the Phase 1 operations may have affected this.

Trial pts were stable when excavated, to a maximum depth of 4.5m, though were only open for short durations. Excavations which are open to shallow depths of for short durations may be expected to be stable. There appears to be sufficient space to batter back excavation faces where longer term excavations are required.

Groundwater entry was not recorded in trial pits but was recorded in all but one borehole. Ponded surface water and near surface groundwater levels have been recorded, so groundwater entry into excavations may be anticipated, though the strata at site are of low permeability, other than the existing Type 1. Perched water may be anticipated within the made ground and disturbed / reworked soils.

The materials at formation level will principally be cohesive. Haul roads may be required for areas which are to be trafficked. It should be noted that if any shallow cohesive deposits at the Site are encountered in open excavations they may be difficult to work and traffic and may be moisture susceptible. Consequently, appropriate Site control should be employed in order to limit the impact of trafficking of sensitive materials. Where granular soils are likely to be encountered within shallow excavations within the Site, these soils are not anticipated to be moisture susceptible. A geotextile separator should be employed prior to placing stone for haul roads.

5.11 Infiltration Drainage

Infiltration drainage is not appropriate at the site as the strata are of low permeability.

5.12 Further Ground Investigation

Further ground investigation is required to delineate the areal extent and depth of the animal (chicken) burial pit encountered in trial pit TP08.

This trial pit was formed beneath the former footprint of the bund.

The farmer does not recall ever doing anything in that area, as it was under the original banking which had been there before his time. He thinks it could date back to the 1970s.

6. Conclusions and Recommendations

6.1 General

The aim of this report was to present the findings of a combined Desk Study and intrusive Ground Investigation at the Site, with recommendations to address geotechnical or contamination issues where required.

This has included assessment of potential contamination issues at the Site in accordance with Part IIa of the 1990 Environmental Protection Act, as well as the suitability of the Site for the proposed use with respect to planning.

From a geotechnical perspective the ground conditions revealed by intrusive investigation have been interpreted and the engineering test results have been assessed to provide outline guidance on geotechnical issues pertinent to the proposed development.

6.2 Contamination

6.2.1 Likely Part IIa Position

Considering the current use of the Site it is unlikely that the recorded concentrations of contaminants would constitute a significant risk to any receptors. Consequently, it is not considered that the Site in its current state would be classed as Contaminated Land (as defined in Part IIa of the 1990 Environmental Protection Act).

6.2.2 Proposed Use

The Site is considered suitable for development, although the following sub-sections provide supplementary conclusions and/or recommendations to facilitate the Site development, ***which includes further monitoring at the Site***.

6.2.2.1 Human Health

The presence of asbestos contaminated materials within the earthen bund presents a potential risk to human health. Due to the potential for these materials to be present at ground surface then mitigation measures will be required to protect current and future site users.

Buried chicken carcases have been identified in 2 trial pits located on the centre east of the Site. Due to the location of the carcasses, buried at depth, it is not thought that they present a risk to human health in their current location, however, carcasses present an unknown risk to human health and therefore if there is an intention to disturb the carcasses then further assessment of the risk to human health will be required. Delineation works to identify the extents of the burial pit may be required to assess if disturbance will be caused by the development works, and may also be required as part of an Environmental Permit, if one is required for the operation of the Site.

6.2.2.2 Ground Gas

Assessment of the gas monitoring data for the boreholes screened within the shallow drift deposits identified a worst-case gas screening value of <0.008 l/hr (equivalent to a characteristic gas situation CS1) for the shallow boreholes. This assessment is in line with expectations for the ground conditions encountered which generally recorded low organic matter content.

However, all three monitoring rounds were conducted during periods of high pressure and therefore it is possible that the Local Authority may require further monitoring to be undertaken during a period of low pressure in order to assess the worst-case scenario ground gas conditions.

6.2.2.3 Water Environment

Elevated concentrations of several metals and individual PAHs were recorded in soil leachates and groundwater in localised areas of the Site. In general the exceedances were marginal or located a significant distance from the closest Controlled Water and therefore are not considered to present a risk to Controlled Waters. However, the proximity to the pond of BH04, which contained elevated metals and PAHs, presents a possible to Controlled Waters if these substances are found to be migrating in to the pond and/ stream. In order to assess if contaminants of concern are impacting on Controlled Water then further monitoring should be undertaken to assess water quality in the

pond and the stream to the north, and a repeat round of groundwater monitoring should be undertaken to confirm the condition of groundwater on Site.

6.2.2.4 Soils Disposal

A preliminary assessment based on observations from the trial pits and boreholes suggests that materials on Site are likely to be Non-Hazardous. There is the potential that some material may qualify as inert waste. A full waste characterisation and classification exercise, including WAC testing of all waste materials, will be required to determine final waste classifications.

6.2.2.5 Potential for Unexpected Contamination

Should any signs of unexpected contamination be identified during earthworks or construction (e.g. burial pits, hydrocarbon impacted soils, asbestos, etc.), work in such areas should be temporarily halted until a suitably qualified professional has been consulted to assess the situation and provide advice.

6.2.2.6 Imported Materials

It is recommended that any imported material required for construction purposes is subject to chemical analysis and assessed against relevant screening criteria to demonstrate its suitability for use.

6.3 Geotechnical

6.3.1 Ground Conditions

The ground conditions at the Site comprise made ground overlying deposits of the Weald Clay.

The made ground is 0.3 – 2.2m thick and generally comprises reworked local soils (the Weald Clay) with a varying fraction of anthropogenic matter such as brick, concrete and clinker fragments and ash. The previous ground investigation identified 0.15 – 1.6m of Type 1 in the southwest of the site.

Note that an animal (chicken) carcass burial pit was encountered in a trial pit (TP08) and requires further investigation.

The Weald Clay was encountered at 0.3 – 2.2m and proven to a maximum depth of 11.76m. The stratum is generally firm to stiff (sandy) silty Clay, becoming stiff and very stiff with depth. Trial pits recorded (clayey) gravel of mudstone and flint below c.3 – 4m. Borehole BH01recorded weathered mudstone at 4.3 – 11m, then mudstone.

A bund of stockpiled materials was present immediately north of the existing farm buildings and was relocated to the east of the proposed development site in early 2019. The material is the local Weald Clay with a varying fraction of anthropogenic matter, principally brick fragments.

While trial pits were dry in the short durations they were open, groundwater was encountered in all but one borehole, at depths of 0.45 – 8m, with two boreholes recording second water strikes at 10.6m and 11m. Monitoring of standpipes revealed water levels as high as 0.25 – 1.59m. The monitoring may not have revealed the true groundwater regime; seasonal fluctuations may occur. Ponded water was observed during the 2019 ground investigation. The groundwater level is assumed to be at surface.

6.3.2 Foundations

6.3.2.1 Building Foundations – General

The made ground, including reworked local soils, is not a suitable founding stratum.

Assessment of structural foundations should include: loadings in the tank empty and tank full scenarios; uplift due to the high groundwater table; total settlement; differential settlement within a structure; differential settlement between structures which are linked by conveyor belts, rails, rigid pipelines and the like; and those structures where overturning and sliding may be of more concern than bearing resistance.

Note that granular fills placed beneath ground surface may effectively act as sumps for water due to the comparative lack of permeability of the surrounding strata.

6.3.2.2 Anaerobic Digester Foundations

DVO requires the structure to be placed 750mm above the water table.

It is assumed that the digester imparts a bearing pressure of 190kPa into the ground beneath its internal walls, and a loading of 50 – 60kPa outside these areas. It is also assumed that made ground beneath the structure will be excavated and replaced with well compacted granular material, and that the structure will be founded at surface level above this. In the absence of information from DVO an allowable total settlement of 25mm has been assumed.

Consideration of bearing and settlement indicates that the in-situ firm to very stiff Weald Clay below the made ground is likely to be sufficiently competent to provide the required bearing capacity and to limit settlements at 1.5m bgl, without a need for further dig-out and replacement, provided the stratum is encountered by that depth.

It is recommended that an experienced ground engineering professional inspects the exposed sub-formation (firm to stiff clay) prior to backfilling to confirm that the strength and consistency of the founding stratum is in accordance with the design assumptions.

6.3.2.3 Foundations for Other Proposed Structures

Structural details, loadings and criteria such as allowable settlement are not available for the numerous other proposed structures required for the development. Once these details are available it will be possible to address the founding conditions on an individual basis. General guidance applies as for the digester.

The northernmost existing farm building is to be re-used within the proposed development. Details of its foundations are not known.

6.3.3 Ground Aggressivity

Consideration of chemical test data indicates that Design Sulfate Class DS–2 and Aggressive Chemical Environment Class AC–2 apply to the Site after the recommendations of BRE SD1. The available testing does not indicate the presence of pyrites. Made ground and disturbed ground should be removed from within proximity (0.5m) of any proposed buried concrete, metal, or other potentially sensitive elements of the works such as pipework.

6.3.4 Roads and Tracks

The existing road immediately south of the northernmost farm building is to be re-used and not modified. Elsewhere within the site a surfacing of Type 1 is to be provided.

Prior to placing the Type 1, the surface should be levelled and prepared, including the removal of any unsatisfactory materials such as soft spots and artificial matter. It would be prudent to place a geotextile separator on the surface prior to placing the Type 1. The thickness of the Type 1 layer will be dependent on the anticipated vehicular loads. Should the loads be great or should the clay surface be made ground or reworked ground, then it would be prudent to also use a geogrid as basal reinforcement for the Type 1 materials.

6.3.5 Earthworks

It is assumed that the site will more or less be at existing levels, the surface being prepared to be level or to have a gentle fall. It is understood that this platforming exercise will yield shallow slope angles.

6.3.6 Re-use of Site Won Materials

Site won materials will be made ground, including some existing Type 1, and the Weald Clay. The made ground may largely be reworked Weald Clay with some artificial matter. The site won materials will be suitable, geotechnically, as landscape fills. However, DVO states that the backfill to the AD

tank shall be Type 1 / made ground, and that silty clay shall not be used as backfill, though this is contradicted by a DVO drawing which indicates “backfilled native soil”.

In all cases, prior to reuse of any material on Site, consideration should be given to the results of chemical analytical testing which are discussed elsewhere in this report.

There is no requirement for earthworks materials or fills on site other than granular material for placement beneath structures. The granular fills require to be imported.

6.3.7 Site Clearance, Excavations and Groundwater

There is little requirement for Site clearance. A Phase 1 earthworks operation has moved a bund of stockpiled materials away from the required working area. Topsoil strip and minor vegetation clearance may be required, though the Phase 1 operations may have affected this.

Trial pts were stable when excavated, to a maximum depth of 4.5m. Excavations which are open to shallow depths of for short durations may be expected to be stable. There appears to be sufficient space to batter back excavation faces where longer term excavations are required.

Groundwater entry was not recorded in trial pits but was recorded in all but one borehole. Ponded surface water and near surface groundwater levels have been recorded. Groundwater entry into excavations may be anticipated, though the strata at site are of low permeability. Perched water may be anticipated within the made ground and disturbed / reworked soils.

The materials at formation level will principally be cohesive, moisture susceptible, and may be difficult to work and traffic. A geotextile separator should be employed prior to placing stone for haul roads.

6.3.8 Infiltration Drainage

Infiltration drainage is not appropriate at the site as the strata are of ow permeability.

6.3.9 Further Ground Investigation

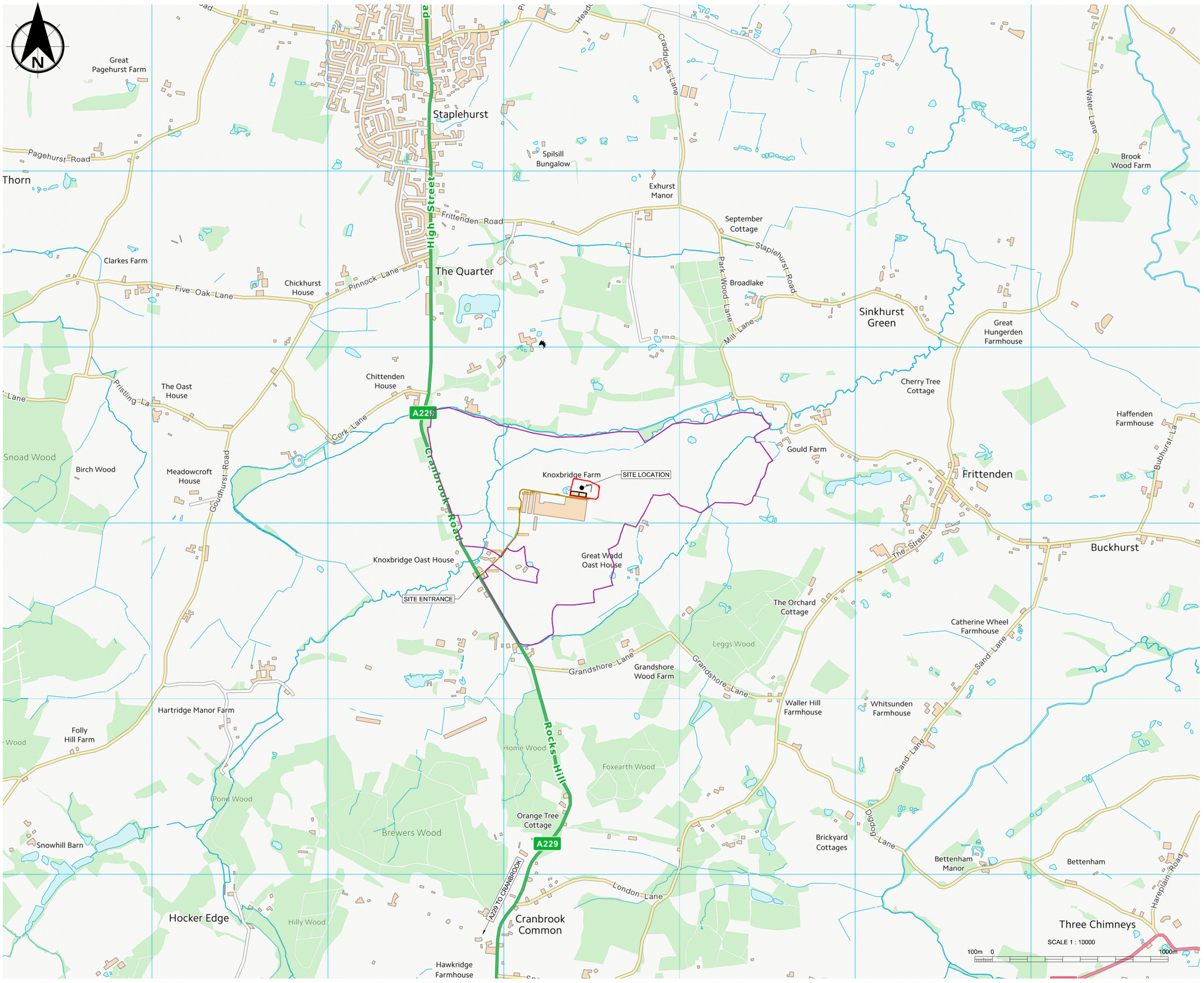
Further ground investigation is required to delineate the areal extent and depth of the animal (chicken) burial pit encountered in trial pit TP08 which was formed beneath the former footprint of the bund. The farmer does not recall ever doing anything in that area, as it was under the original banking which had been there before his time. He thinks it could date back to the 1970s.

6.4 Recommendations

The following actions are recommended to further assess risks identified within this report-

a) Further ground investigation is required to delineate the areal extent and depth of the animal (chicken) burial pit encountered in trial pits TP08 and TP08A; and;
b) Surface and groundwater monitoring should be undertaken to further assess the potential risk from groundwater to Controlled Waters.
c) Action should be taken to address the risk from asbestos within the earthen bund to current and future site users

Drawings



NOTES

1. CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2018.
2. ACCURACY OF MAP IMAGE NOT GUARANTEED DUE TO REPRODUCTION METHODS.
3. FOR DETAILS OF THE PROPOSED LAYOUT REFER TO SWECO DRAWING: '120932-NRG-DWG-0401'.

LEGEND

- LEASE BOUNDARY
- LANDOWNER BOUNDARY
- ACCESS TRACK

Rev.	Date	Amendment Details	Drawn	Chk'd	App'd
0	30/10/18	FIRST ISSUE	JHD	SC	CM

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SWECO

Client

GREEN CREATE
Waste-to-Value Solutions

Drawing Status

FOR INFORMATION

Project Title

FRIDAYS AD PLANT

Drawing Title

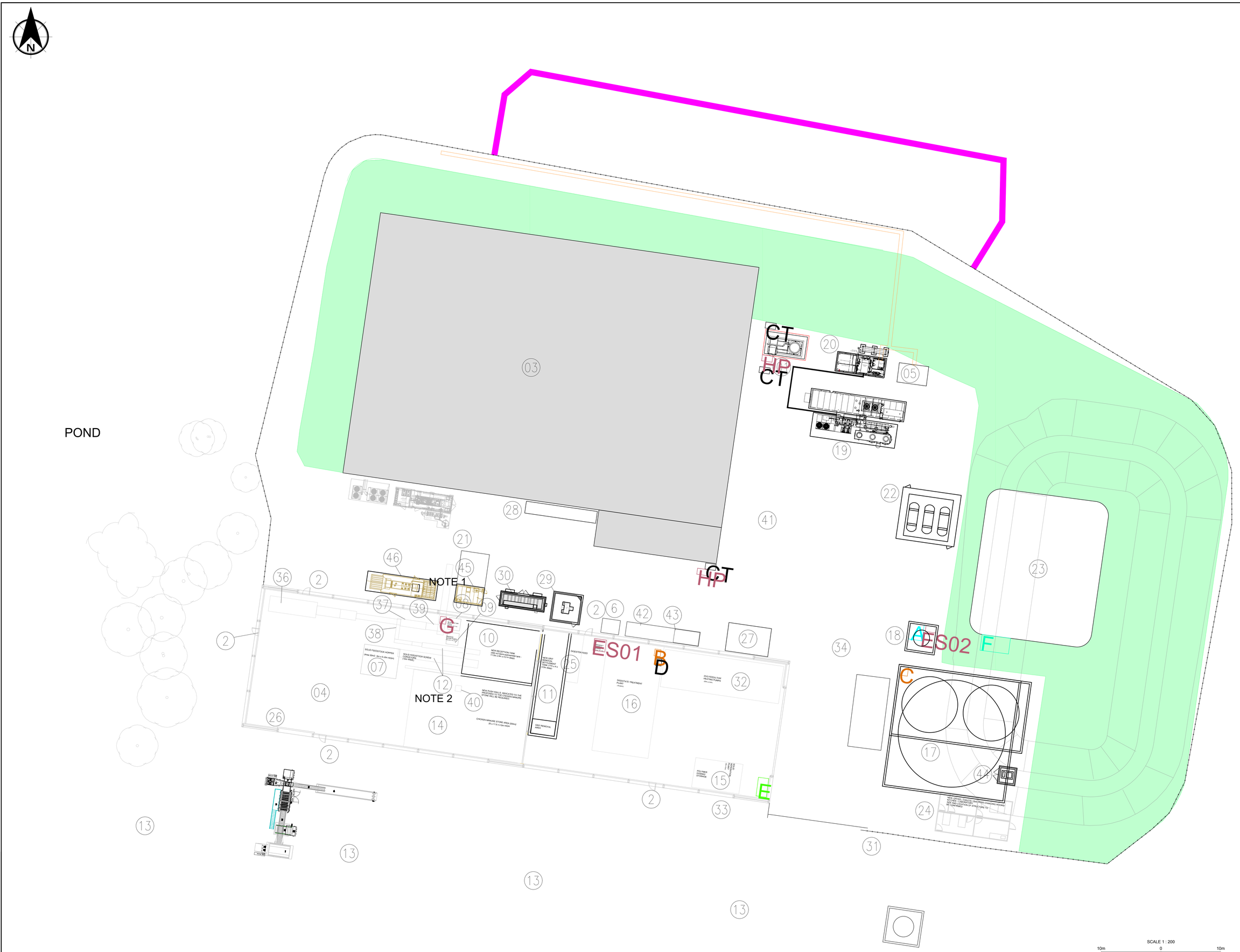
SITE LOCATION PLAN

Scale	Designed	Drawn	Checked	Approved
1:10,000	JHD	JHD	SC	CM
Original Size	Date	Date	Date	Date
A1	30/10/18	30/10/18	30/10/18	30/10/18

Drawing Number: 120932-NRG-DWG-0400

Revision: 0

P:\EY\120932_Fridays AD Plant Detailed Design\05 Design and Project Delivery\Drawings\Working Drawings\ 120932-NRG-DWG-0400-00 Site Location Plan.dwg



SCALE 1 : 200

10m 0 10m

NOTES

1. THE ENCLOSED DIMENSIONS AND EXISTING DETAILS PROVIDED HAVE BEEN TAKEN FROM EXISTING SCORPION DRAWINGS.
2. THE REVISED LAYOUT IS AN INDICATIVE ASSESSMENT OF ADDITIONAL WORKS REQUIRED.
3. DISCHARGE MATERIAL FROM BIOEXTRUDER TO BE COLLECTED OUTSIDE OF THE BUILDING.
4. INSTALLATION OF A SHOOT TO DIVERT MATERIAL FROM EXISTING CONVEYOR MAY BE REQUIRED. A LOADER WILL MOVE THE MATERIAL TO THE EAST OF THE STORAGE AREA.

STRUCTURE & EQUIPMENT LABELS

01 FLARE
02 NEW PERSONNEL AND FIRE DOORS
03 ANAEROBIC DIGESTER
04 LOADING AREA. BASED ON A 15m LONG LORRY
05 DRYERS
06 SKIPPER AND SCRUBBER OF DIGESTATE TREATMENT PLANT
07 SOLID FEED STOCK HOPPER
08 RECEPTION TANK PUMPS
09 PROCESS WATER PUMPS
10 RECEPTION TANK
11 GRIT REMOVAL SETTLEMENT TANK
12 CONVEYOR
13 EXISTING BUILDING
14 MANURE STORAGE
15 DIGESTATE TREATMENT PLANT
16 SOLID SEPARATION PLANT
17 6 No.100m³ AMMONIUM SULFATE STORAGE TANKS
18 1 No. 100m³ SULFURIC ACID STORAGE TANK & DELIVERY HARDSTAND
19 BIOGAS UPGRADE PLANT
20 GRID ENTRY UNIT
21 CHP AND PRE-TREATMENT PLANT
22 6 No. PROPANE TANKS
23 LAGOON (30 DAY STORAGE)
24 OFFICE TOILETS LABORATORY
25 DIGESTER FEED PUMPS
26 NEW LARGE OPENING IN THE EXISTING STRUCTURE
27 BOILER ENCLOSURE
28 ACCESS STAIRS TO ROOF OF DIGESTER
29 AD TRANSFORMER SIZE & LOCATION TBC
30 SWITCH ROOM SIZE & LOCATION TBC
31 JUNCTION REVISED TO ALLOW DELIVERY LORRIES TO REVERSE
32 DVO DIGESTER FEED PUMPS
33 OPERATORS PARKING AREA PARALLEL TO BUILDING
34 PRECAST CONCRETE CHANNEL FOR CONNECTION OF SERVICES
35 -
36 BALES TABLE 10m
37 1800 BALES BREAKER AND TDA
38 DE-STONING AND METAL BELT
39 BIO-EXTRUDER 90e
40 CONVEYOR / AUGER
41 PATH FOR HEATING AND MIXING PIPES TO BE TAKEN UNDER GROUND LOCALLY FOR ACCESS TO 30/21/29
42 BYOSIS HEAT EXCHANGERS
43 -
44 UKPN SWITCH ROOM
45 STANDBY GENERATOR FUEL TANK
46 STANDBY GENERATOR

PROPANE
DIGESTER HEATING PIPE
1.8m HIGH PALISADE FENCE

Rev.	Date	Amendment Details	Drawn	Chk'd	App'd
0	30/10/18	FIRST ISSUE	JHD	CM	CM

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Waste-to-Value Solutions

Drawing Status
FOR COMMENT

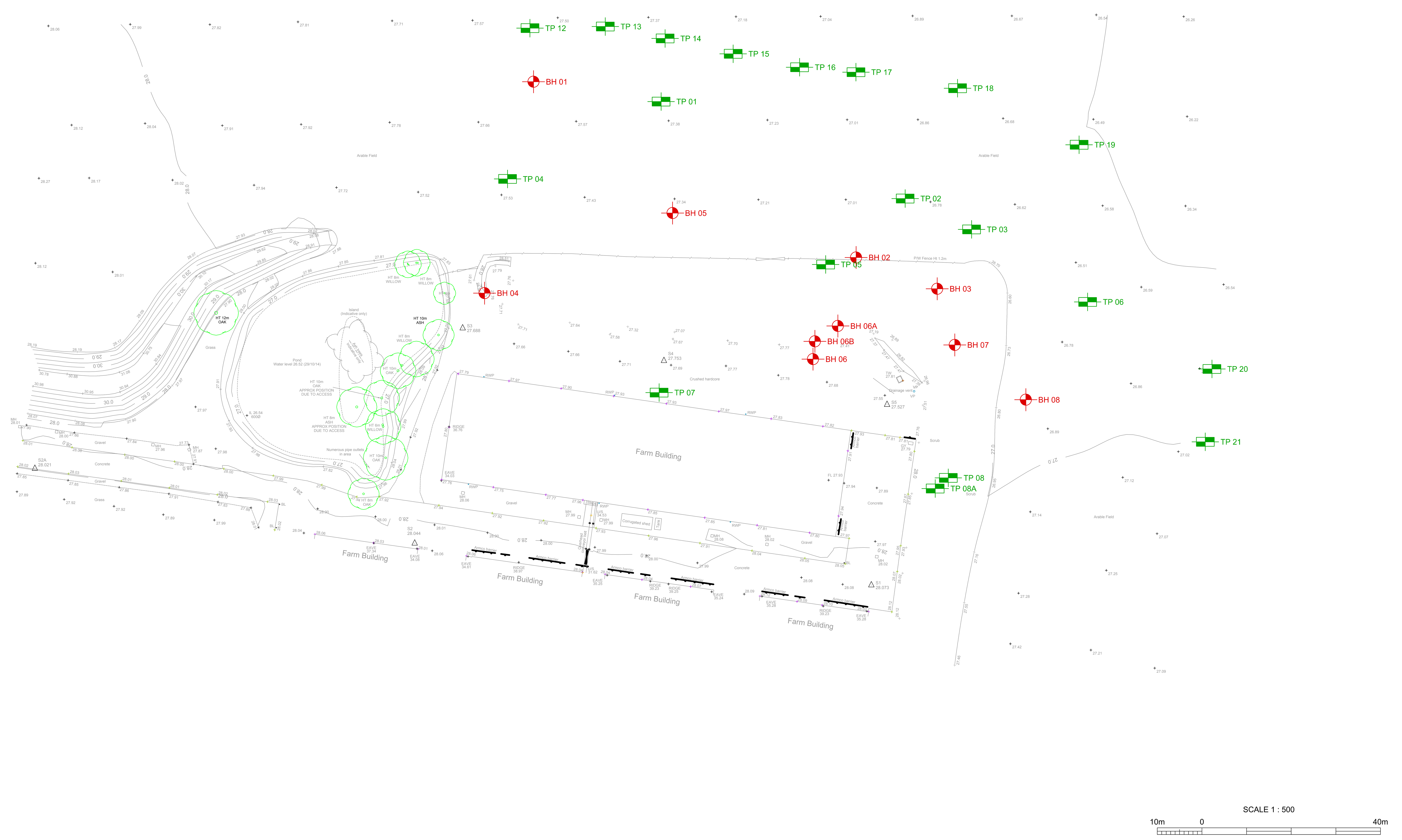
Project Title
FRIDAYS AD PLANT

Drawing Title
PROPOSED SITE LAYOUT

Scale	Designed	Drawn	Checked	Approved
1:200	RME	JHD	CM	CM
Original Size	Date	Date	Date	Date
A0	30/08/18	30/08/18	30/08/18	30/08/18

Drawing Number: 120932-NRG-DWG-0401
Revision: 00

Fridays AD Plant Coordinates					
Location ID	Location Type	Easting	Northing	Ground Level	Final Depth
BH01	CP	579400.54	141247.27	25.27	11.76
BH02	CP	579472.79	141207.93	26.91	10
BH03	CP	579490.94	141200.92	27.05	10
BH04	CP	579389.58	141199.95	25.27	10
BH05	CP	579431.69	141217.87	25.27	10
BH06	CP	579463.14	141185.17	27.74	0.85
BH06A	CP	579468.71	141192.59	27.81	0.4
BH06B	CP	579463.55	141189.15	27.41	10.76
BH07	CP	579494.89	141188.35	25.27	10
BH08	CP	579510.79	141176.08	27.25	10
TP01	TP	579429.11	141242.83	25.301	4
TP02	TP	579483.77	141221.12	25.427	4.3
TP03	TP	579498.64	141214.21	25.419	4.2
TP04	TP	579394.73	141225.51	25.279	4
TP05	TP	579465.96	141206.36	25.674	4.2
TP06	TP	579524.63	141197.98	25.364	4.2
TP07	TP	579428.67	141177.68	26.143	4.5
TP08	TP	579493.43	141158.59	27.829	1.6
TP08A	TP	579490.5	141156.2	27.866	0.8
TP12	TP	579399.75	141259.27	28.45	2
TP13	TP	579416.62	141259.63	29.01	2
TP14	TP	579430.01	141256.96	28.86	2
TP15	TP	579445.25	141253.52	28.56	2
TP16	TP	579460.12	141250.51	28.46	2
TP17	TP	579472.75	141249.41	28.57	2
TP18	TP	579495.5	141245.82	27.81	2
TP19	TP	579522.72	141233.16	27.54	2
TP20	TP	579552.47	141182.97	28.52	2
TP21	TP	579550.98	141166.66	28.58	2



NOTES

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN m AOD UNLESS SHOWN OTHERWISE.
2. TRIAL PIT'S 12 TO 21 WERE ADVANCED THROUGH AN EARTHEN BUND, EXCAVATIONS DID NOT PENETRATE NATURAL GROUND.

BH 01 BOREHOLE

TP 01 TRIAL PIT

Rev.	Date	Amendment Details	Drawn	Chk'd	App'd
X1	25/04/19	AS BUILT	SC	DS	SL

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SWECO

Client

GREEN CREATE
Waste-to-Value Solutions

Drawing Status
AS BUILT

Project Title
FRIDAYS AD PLANT

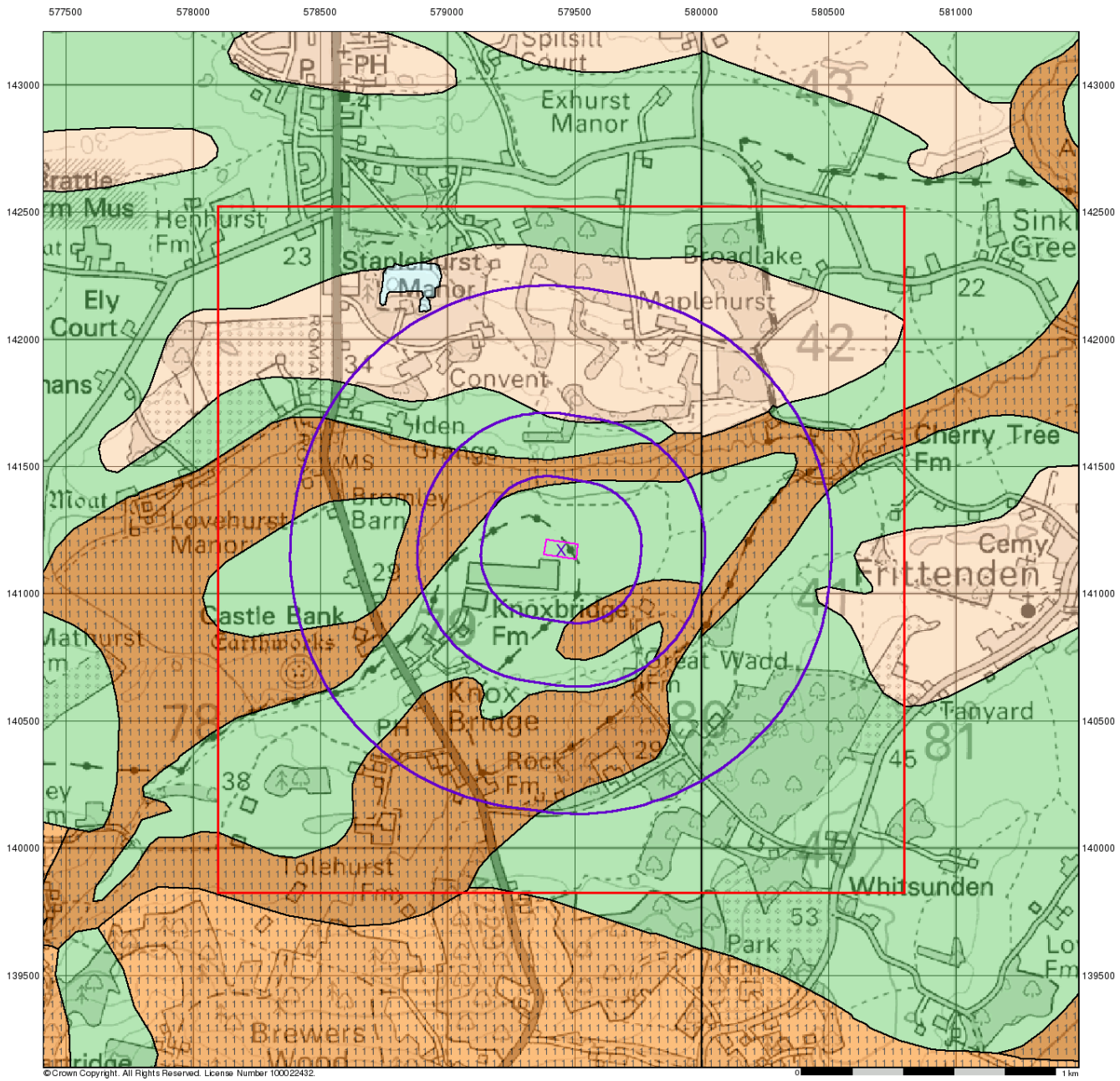
Drawing Title
SI LOCATION DRAWING

Scale	Designed	Drawn	Checked	Approved
1:500	RW	RW	RS	NPT
Original Size: A1	Date: 06/12/18	Date: 06/12/18	Date: 18/01/19	Date: 18/01/19

Drawing Number: 120932-NRG-DWG-0404
Revision: X0

P:\EY\120932_Fridays AD Plant Detailed Design\05 Design and Project Delivery\Drawings\Working Drawings\ 120932-NRG-DWG-0404-X0 SI Location Plan.dwg

Appendix A – Envirocheck and Zetica Reports



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Groundwater Vulnerability

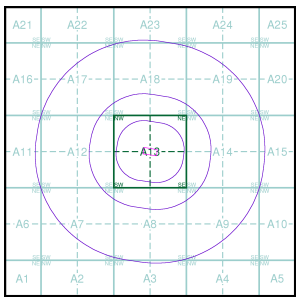
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



Order Details

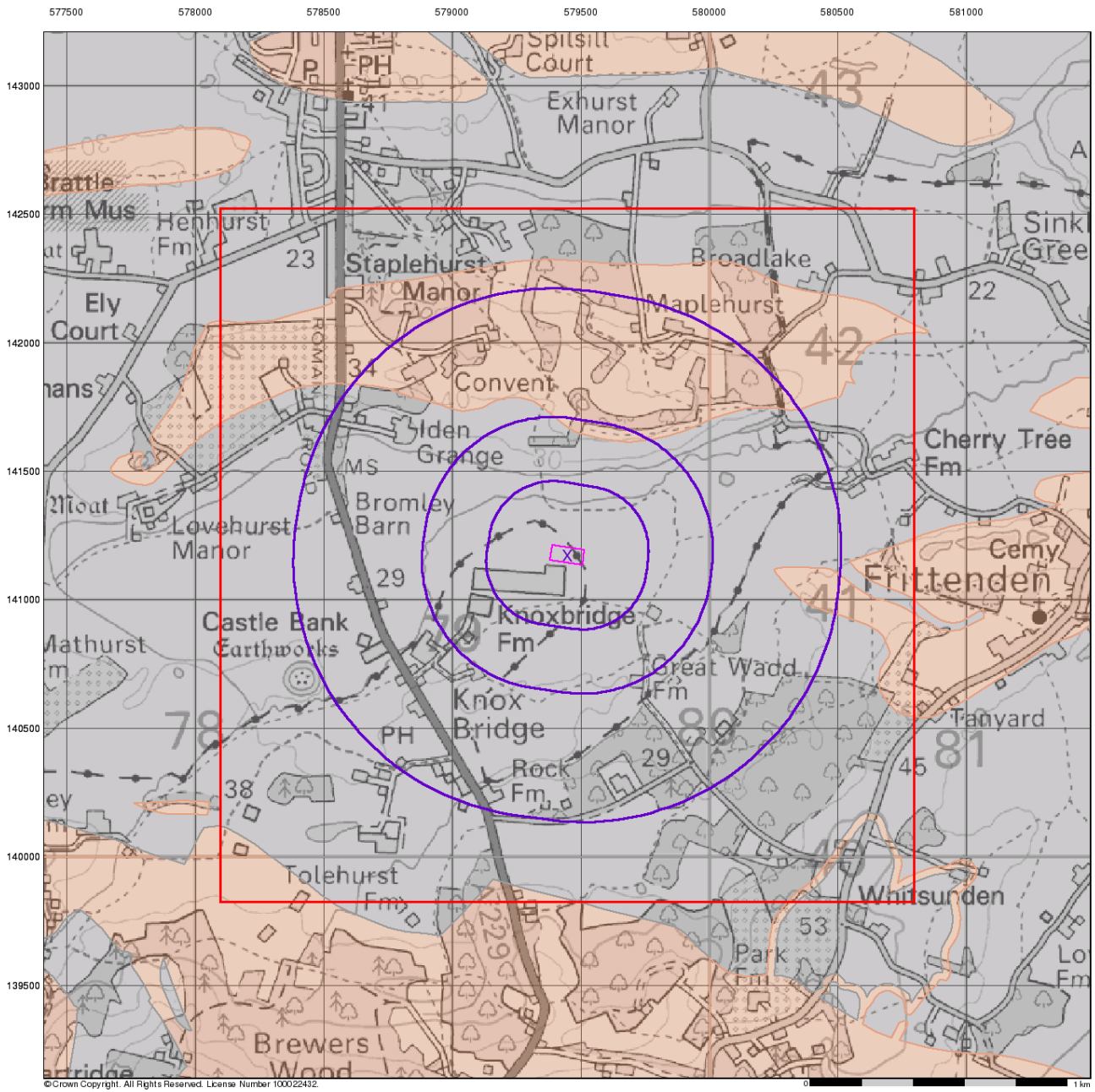
Order Number:	61411958_1_1
Customer Ref:	Knoxbridge Farm ST14236
National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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Bedrock Aquifer Designation

General

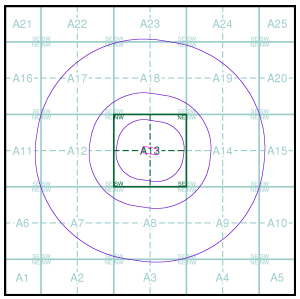
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



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National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

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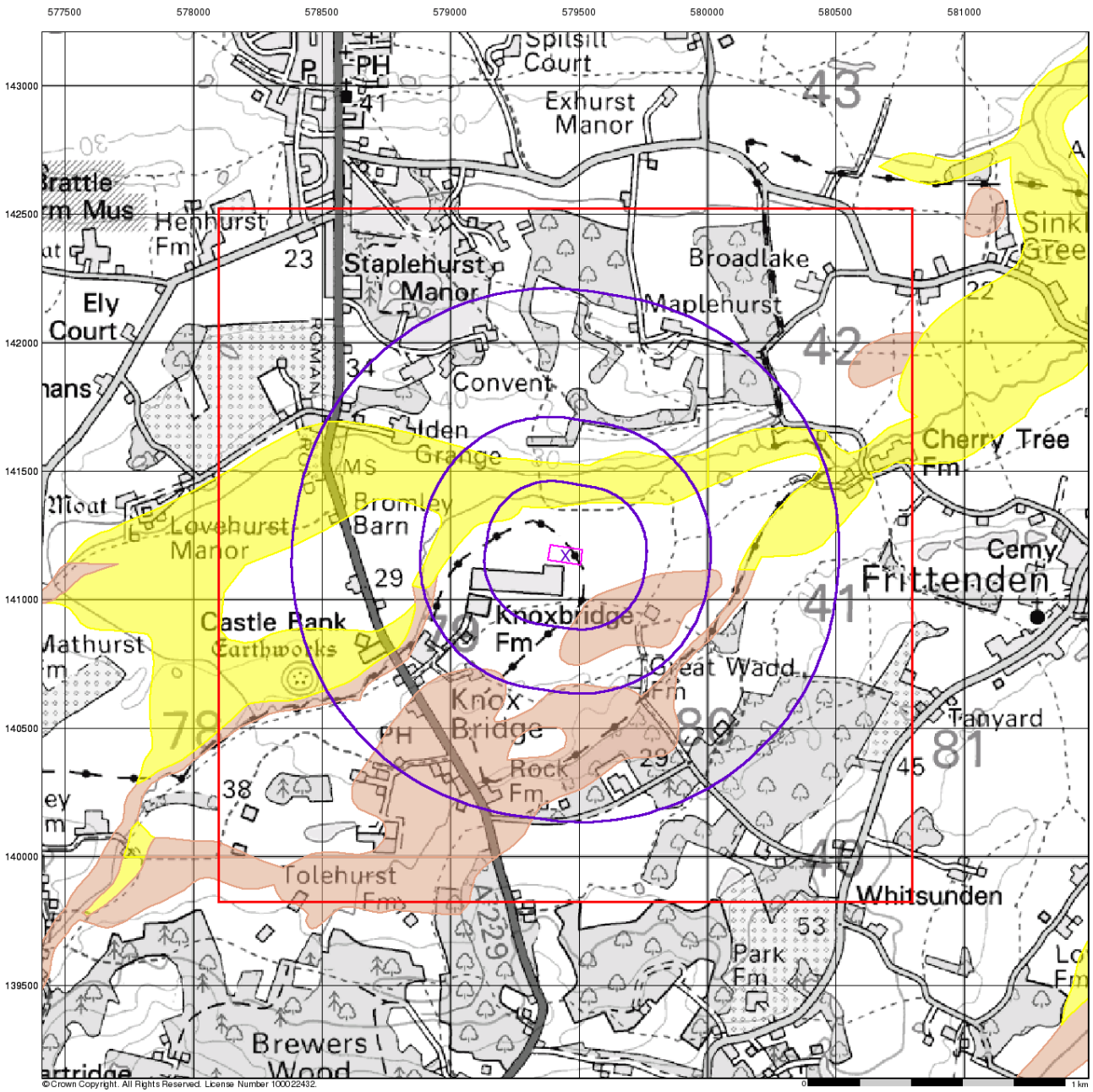

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Superficial Aquifer Designation

General

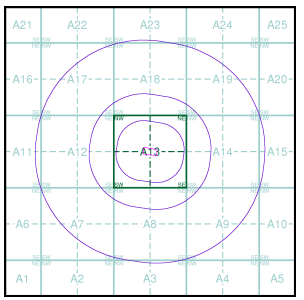
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



Order Details

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National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

Landmark Information Group

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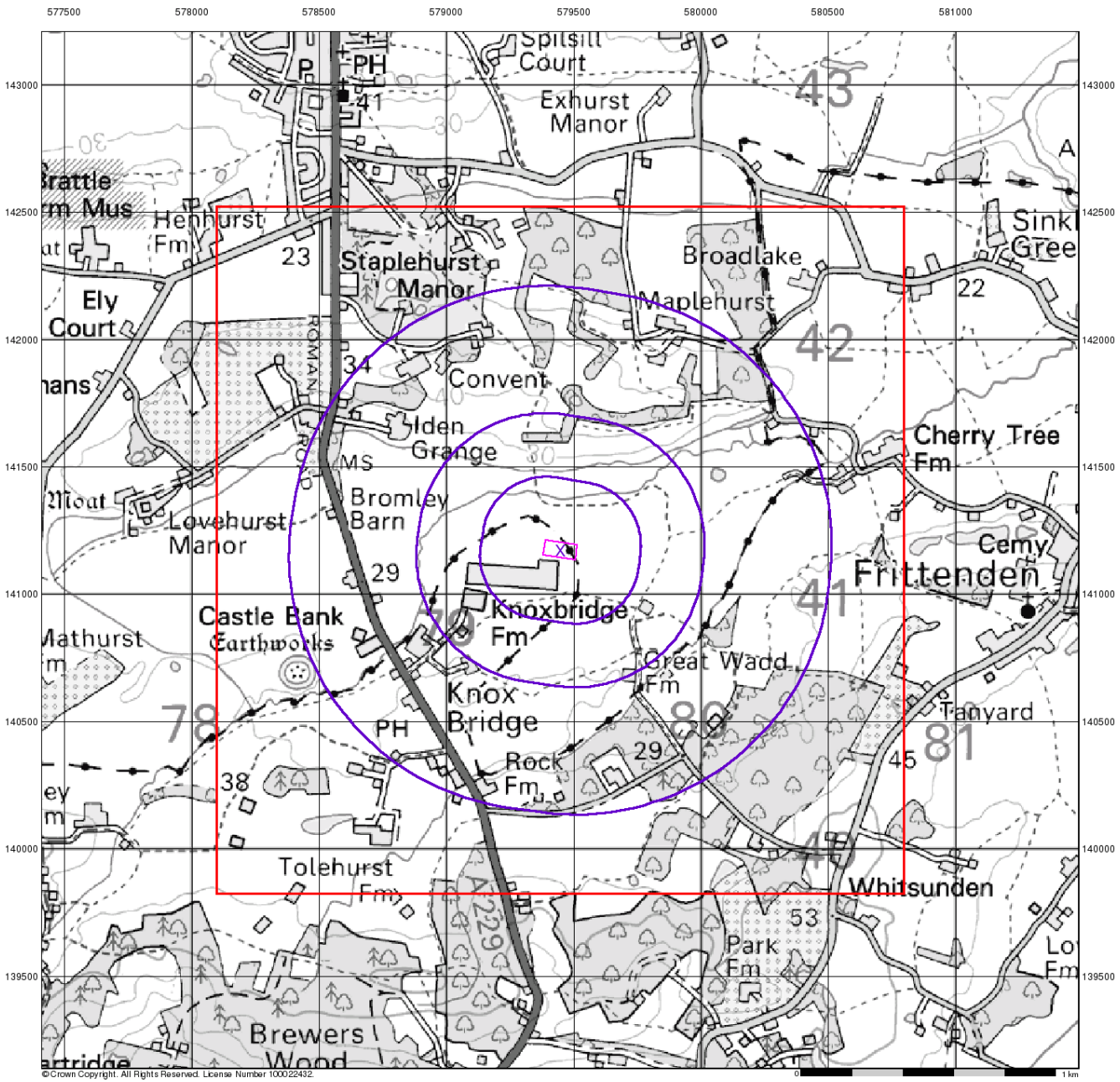
Web: www.envirocheck.co.uk



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Source Protection Zones

General

Specified Site | Specified Buffer(s) | Bearing Reference Point

Slice | Map ID

Agency and Hydrological

Source Protection Zone I

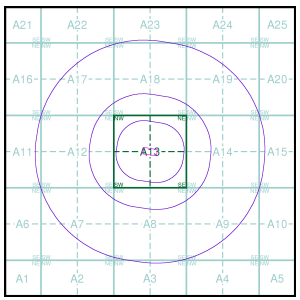
Source Protection Zone II

Source Protection Zone III

Zone of Special Interest

Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



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Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

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Landmark Information Group

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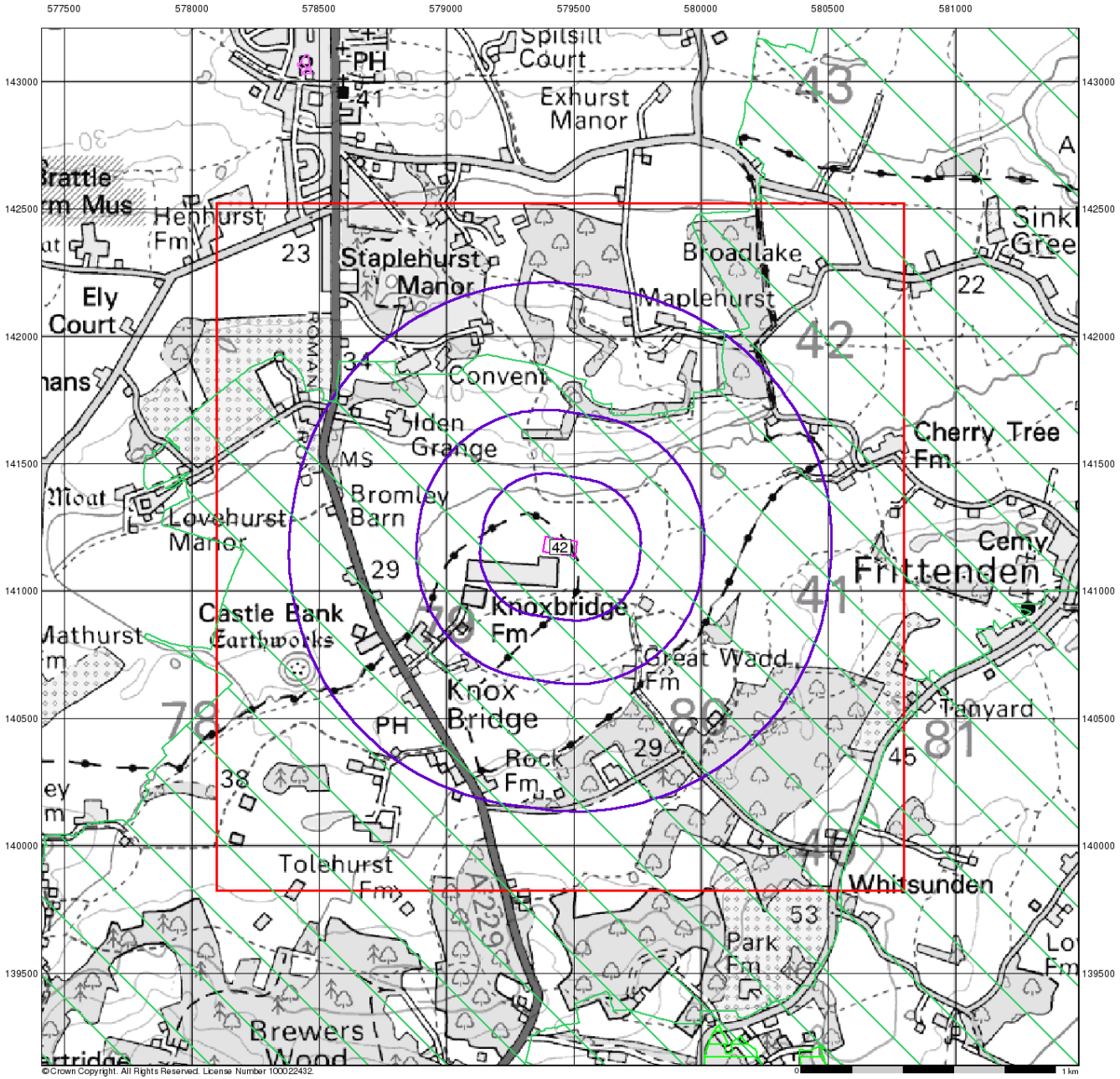
Web: www.envirocheck.co.uk



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Sensitive Land Uses

General

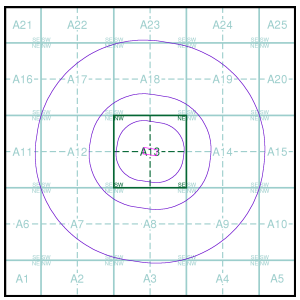
Specified Site | Specified Buffer(s) | Bearing Reference Point

Slice | Map ID

Sensitive Land Uses

- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

Site Sensitivity Context Map - Slice A



Order Details

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Customer Ref:	Knoxbridge Farm ST14236
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Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

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Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
61411958_1_1

Customer Reference:
Knoxbridge Farm ST14236

National Grid Reference:
579450, 141170

Slice:
A

Site Area (Ha):
0.75

Search Buffer (m):
1000

Site Details:

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CRANBROOK
Kent
TN17 2BT

Client Details:

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Wardell Armstrong LLP
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46 Chancery Lane
London
WC2A 1JE

Contents

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Peter Brett Associates Copyright Notice

Radon Potential dataset Copyright Notice

Report Version v49.0

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1			1	13
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control	pg 4				8
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls					
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 6		Yes		
Pollution Incidents to Controlled Waters	pg 6				2
Prosecutions Relating to Authorised Processes					
Prosecutions Relating to Controlled Waters					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions	pg 7				(*9)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 9	Yes	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 9	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 9		Yes	n/a	n/a
Flooding from Rivers or Sea without Defences	pg 9		Yes	n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
Detailed River Network Lines	pg 9		Yes	Yes	n/a
Detailed River Network Offline Drainage	pg 13			Yes	n/a

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Recorded Landfill Sites					
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					
Geological					
BGS 1:625,000 Solid Geology	pg 15	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 15	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
Brine Compensation Area			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 23	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 23	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 24		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 24	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 24		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 24	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 25				1
Fuel Station Entries					
Sensitive Land Use					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 26	1			
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Mr J Thompson Property Type: Domestic Property (Single) Location: Rose Cottage Farm Barn, Cranbrook Road, Frittenden, Kent, Tn17 2bt Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P06349 Permit Version: 1 Effective Date: 23rd August 1996 Issued Date: 23rd August 1996 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	347	2	579400 140800
2	**Discharge Consents** Operator: Mr N.H.Furlonge Property Type: Undefined Or Other Location: Honeywell Oast, Knoxbridge, Frittenden Kent Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P01983 Permit Version: 1 Effective Date: 25th January 1989 Issued Date: 25th January 1989 Revocation Date: Not Supplied Discharge Type: Non Water Company (Private) Sewage Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 100m	A12SE (SW)	543	2	578900 140900
3	**Discharge Consents** Operator: Mr C Austen Property Type: Domestic Property (Single) Location: Knoxbridge Barn,Frittenden,Kent Knoxbridge Barn, Cranbrook Road, Frittenden,Cranbrook, Kent, Tn17 2bt Authority: Environment Agency, Southern Region Catchment Area: River Beult Reference: P11321 Permit Version: 1 Effective Date: 20th February 2003 Issued Date: 20th February 2003 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: A Tributary Of River Beult **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	577	2	578950 140770
4	**Discharge Consents** Operator: Mr Baker Property Type: Domestic Property (Single) Location: 1-4 Orchard Cottages, Cranbrook Road, Staplehurst, Tonbridge, Kent, Tn12 0eu Authority: Environment Agency, Southern Region Catchment Area: River Beult Reference: P06537 Permit Version: 1 Effective Date: 6th January 1997 Issued Date: 6th January 1997 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A12SW (W)	649	2	578750 141000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	**Discharge Consents** Operator: Ian Standen Property Type: Domestic Property (Single) Location: 2 Gordon Cottages, Cranbrook Road, Frittenden, Kent Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P06381 Permit Version: 1 Effective Date: 20th September 1996 Issued Date: 20th September 1996 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A12NW (W)	716	2	578700 141400
5	**Discharge Consents** Operator: D G Macey Property Type: Domestic Property (Single) Location: 1 Gordon Cottages, Cranbrook Road, Frittenden, Kent, Tn17 2bw Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P06382 Permit Version: 1 Effective Date: 20th September 1996 Issued Date: 20th September 1996 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A12NW (W)	716	2	578700 141400
5	**Discharge Consents** Operator: Mr Lower Property Type: Domestic Property (Single) Location: 2 Ian Cottages, Cranbrook Road, Frittenden, Kent, Tn17 2bp Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P06383 Permit Version: 1 Effective Date: 20th September 1996 Issued Date: 20th September 1996 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A12NW (W)	716	2	578700 141400
6	**Discharge Consents** Operator: P J Wheatley Esq. Property Type: Horticulture Est. Nursery Gardens Location: Cottage Garden Nursery, Cranbrook Road, Staplehurst, Kent Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P04024 Permit Version: 1 Effective Date: 8th January 1992 Issued Date: 8th January 1992 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Post National Rivers Authority Legislation where issue date > 31/08/1989** Positional Accuracy: Located by supplier to within 100m	A7NW (SW)	733	2	578750 140780

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Discharge Consents** Operator: Mr Cox Property Type: Domestic Property (Single) Location: Little Knoxbridge, Cranbrook Rd, Staplehurst, Kent Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: P09800 Permit Version: 1 Effective Date: 9th March 2001 Issued Date: 9th March 2001 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 10m	A12SW (W)	779	2	578610 141040
8	**Discharge Consents** Operator: Mr J.Aldhouse Property Type: Undefined Or Other Location: Wadd Farm, Grandshore Lane, Frittenden , Cranbrook Kent Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P02757 Permit Version: 1 Effective Date: 5th February 1990 Issued Date: 5th February 1990 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Into Land Receiving Water: Into Land **Status: Post National Rivers Authority Legislation where issue date > 31/08/1989** Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	805	2	580000 140500
9	**Discharge Consents** Operator: Mr Thomas Rae & Mrs Margaret Bernadette Smith Property Type: Domestic Property (Single) Location: Rock Farm Oast, Cranbrook Road Rock Farm Oast, Cranbrook Road, Frittenden, Kent, Tn17 2bl Authority: Environment Agency, Southern Region Catchment Area: Medway Reference: P20353 Permit Version: 1 Effective Date: 24th November 2004 Issued Date: 24th November 2004 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: A Tributary Of River Beult **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A8SW (S)	901	2	579200 140270
10	**Discharge Consents** Operator: Mr Redmayne Property Type: Domestic Property (Single) Location: The Old Barn, Rocks Hill, Cranbrook, Kent Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: P07262 Permit Version: 1 Effective Date: 7th July 1998 Issued Date: 7th July 1998 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A8SW (S)	932	2	579150 140250

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	**Discharge Consents** Operator: Mr & Mrs Gilbert Property Type: Domestic Property (Single) Location: Cresslands Farm Cranbrook Rd Kent Cresslands Farm, Cranbrook Road, Frittenden Cranbrook, Kent, Tn17 2bl Authority: Environment Agency, Southern Region Catchment Area: River Beult Reference: P20696 Permit Version: 1 Effective Date: 11th November 2005 Issued Date: 11th November 2005 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Of The River Beult **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A7SE (SW)	965	2	579040 140250
12	**Discharge Consents** Operator: Mr M L Marchant Property Type: Domestic Property (Single) Location: 1 Ian Cottages, Tolhurst Farm, Cranbrook Road, Frittenden, Kent, Tn17 2bw Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P06330 Permit Version: 1 Effective Date: 2nd August 1996 Issued Date: 2nd August 1996 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A7SW (SW)	982	2	578750 140400
13	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Knoxbridge/Tolehurst Poultry, Knoxbridge Farm, Knoxbridge,, Cranbrook, Kent, TN17 2BT Authority: Environment Agency - South East Region, Kent & South London Area Permit Reference: AP3738ZE Original Permit Ref: Kp3333us Effective Date: 25th March 2013 **Status: Effective** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A7NE (SW)	619	2	578873 140800
13	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Knoxbridge/Tolehurst Poultry, Knoxbridge Farm, Knoxbridge,, Cranbrook, Kent, TN17 2BT Authority: Environment Agency - South East Region, Kent & South London Area Permit Reference: WP3432CD Original Permit Ref: Kp3333us Effective Date: 13th August 2012 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y	A7NE (SW)	619	2	578873 140800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Knoxbridge/Tolehurst Poultry, Knoxbridge Farm, Knoxbridge,, Cranbrook, Kent, TN17 2BT Authority: Environment Agency - South East Region, Kent & South London Area Permit Reference: BP3131KQ Original Permit Ref: Kp3333us Effective Date: 16th April 2010 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y	A7NE (SW)	619	2	578873 140800
13	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Knoxbridge/Tolehurst Poultry, Knoxbridge Farm, Knoxbridge,, Cranbrook, Kent, TN17 2BT Authority: Environment Agency, Southern Region Permit Reference: BP3131KQ Original Permit Ref: Kp3333us Effective Date: 16th April 2010 **Status: Effective** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y	A7NE (SW)	619	2	578873 140800
13	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Knoxbridge/Tolehurst Poultry, Knoxbridge Farm, Knoxbridge,, Cranbrook, Kent, TN17 2BT Authority: Environment Agency - South East Region, Kent & South London Area Permit Reference: ZP3338XX Original Permit Ref: Kp3333us Effective Date: 17th April 2008 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A7NE (SW)	619	2	578873 140800
13	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Knoxbridge Farm, Cranbrook Road, Frittenden, Cranbrook, Kent, TN17 2BT Authority: Environment Agency, Southern Region Permit Reference: ZP3338XX Original Permit Ref: Kp3333us Effective Date: 17th April 2008 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y	A7NE (SW)	619	2	578873 140800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Knoxbridge/Tolehurst Poultry, Knoxbridge Farm, Knoxbridge,, Cranbrook, Kent, TN17 2BT Authority: Environment Agency - South East Region, Kent & South London Area Permit Reference: KP3333US Original Permit Ref: Kp3333us Effective Date: 26th October 2007 **Status: Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y	A7NE (SW)	619	2	578873 140800
14	**Integrated Pollution Prevention And Control** Name: Fridays Ltd Location: Cranbrook Road, Frittenden, Cranbrook, Kent, TN17 2BT Authority: Environment Agency, Southern Region Permit Reference: KP3333US Original Permit Ref: Kp3333us Effective Date: 26th October 2007 **Status: Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 6.9 A(1) (A) (I) Activity Description: Intensive Farming; Greater Than 40,000 Poultry Primary Activity: Y	A7NE (SW)	727	2	578879 140626
	Nearest Surface Water Feature	A13NW (W)	5	-	579383 141196
15	**Pollution Incidents to Controlled Waters** Property Type: Cess Pit Location: 1-4 Orchard Cottages, STAPLEHURST Authority: Environment Agency, Southern Region Pollutant: Crude Sewage Note: Sewage In Ditch Incident Date: 15th February 1996 Incident Reference: 396049 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7NW (SW)	723	2	578750 140800
16	**Pollution Incidents to Controlled Waters** Property Type: Domestic/Residential Location: Location Description Not Available Authority: Environment Agency, Southern Region Pollutant: Miscellaneous - Natural Note: Stream White Incident Date: 7th March 1997 Incident Reference: 397079 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: General Pollution - Natural Causes Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7SE (SW)	831	2	579030 140400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Mr A V Breech Licence Number: 05/084 Permit Version: 100 Location: Point A, B, C, D, Pond At Chittenden Farm, Staplehurst Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 25 Yearly Rate (m3): 300 Details: As Boldly Outlined On Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A16NE (NW)	1212	2	578400 141910
	Water Abstractions Operator: Mr A V Breech Licence Number: 05/084 Permit Version: 100 Location: Point D, Pond At Chittenden Farm, Staplehurst Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: As Boldly Outlined On Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NW (NW)	1239	2	578570 142140
	Water Abstractions Operator: James Highwood Day Licence Number: 3/0012/ /SR Permit Version: Not Supplied Location: Paley Farm, CRANBROOK Authority: Environment Agency, Southern Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 455 Yearly Rate (m3): 22730 Details: Auger Hole Stream Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A6NE (SW)	1277	2	578250 140560
	Water Abstractions Operator: Mr J Hasell Licence Number: 9/40/03/0105/Sr Permit Version: 101 Location: Point A Near Frittenden Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Land Boldly Edged In Black Authorised Start: 01 October Authorised End: 31 March Permit Start Date: 6th December 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	1408	2	580080 139850

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Mr P Tompsett Licence Number: 9/40/03/0105/Sr Permit Version: 100 Location: Point A Near Frittenden Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Land Boldly Edged In Black Authorised Start: 01 October Authorised End: 31 March Permit Start Date: 7th August 1991 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A4NW (SE)	1408	2	580080 139850
	Water Abstractions Operator: Mr A V Breech Licence Number: 05/084 Permit Version: 100 Location: Point E, F, Iden Stream At Chittenden Farm, Staplehurst Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: As Boldly Outlined On Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A21SE (NW)	1429	2	578430 142270
	Water Abstractions Operator: Mr A V Breech Licence Number: 05/084 Permit Version: 100 Location: Point B, Pond At Chittenden Farm, Staplehurst Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: As Boldly Outlined On Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A16NE (NW)	1457	2	578140 141960
	Water Abstractions Operator: Mr A V Breech Licence Number: 05/084 Permit Version: 100 Location: Point C, Pond At Chittenden Farm, Staplehurst Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: As Boldly Outlined On Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A16SW (W)	1483	2	577990 141700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Mr A V Breech Licence Number: 05/084 Permit Version: 100 Location: Point F, Iden Stream At Chittenden Farm, Staplehurst Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: As Boldly Outlined On Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A21SE (NW)	1569	2	578180 142210
	Groundwater Vulnerability Soil Classification: Not classified Map Sheet: Sheet 46 East Sussex Scale: 1:100,000	A13SE (SE)	0	2	579447 141173
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13SE (SE)	0	3	579447 141173
	Superficial Aquifer Designations No Data Available				
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NE (N)	172	2	579455 141380
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models and Fluvial Events Boundary Accuracy: As Supplied	A13NE (N)	192	2	579460 141395
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NE (N)	182	2	579460 141385
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
17	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Secondary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NE (N)	191	2	579468 141395
18	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Secondary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NW (NW)	217	2	579333 141421

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NW (N)	285	2	579421 141495
20	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Secondary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NE (NE)	305	2	579720 141416
21	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Secondary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NE (NE)	326	2	579742 141423
22	**Detailed River Network Lines** River Type: Tertiary River River Name: Drain Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (SW)	352	2	579079 140972
23	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13SW (SW)	389	2	579117 140867
24	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Secondary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A14NW (NE)	400	2	579803 141466

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
25	**Detailed River Network Lines** River Type: Tertiary River River Name: Drain Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (SW)	401	2	579058 140915
26	**Detailed River Network Lines** River Type: Tertiary River River Name: Drain Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (SW)	401	2	579058 140915
27	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A18SW (NW)	410	2	579137 141534
28	**Detailed River Network Lines** River Type: Tertiary River River Name: Drain Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A18SW (NW)	410	2	579137 141534
29	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12NE (W)	411	2	578992 141312
30	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12NE (W)	412	2	578993 141317

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
31	**Detailed River Network Lines** River Type: Lake/Reservoir River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NW (SW)	456	2	579163 140752
32	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NW (SW)	456	2	579192 140736
33	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (W)	458	2	578954 140986
34	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (W)	469	2	578935 141007
35	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (W)	469	2	578935 141007
36	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (SW)	470	2	579018 140855

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
37	**Detailed River Network Lines** River Type: Tertiary River River Name: Drain Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (W)	483	2	578903 141086
38	**Detailed River Network Offline Drainage** River Type: Tertiary River Hydrographic Area: D007	A13SE (SE)	306	2	579777 140995
39	**Detailed River Network Offline Drainage** River Type: Tertiary River Hydrographic Area: D007	A13SE (SE)	312	2	579768 140967
40	**Detailed River Network Offline Drainage** River Type: Tertiary River Hydrographic Area: D007	A13SE (SE)	339	2	579758 140909

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Maidstone Borough Council - Has supplied landfill data		0	8	579473 141202
	Local Authority Landfill Coverage Name: Tunbridge Wells Borough Council - Has no landfill data to supply		0	7	579447 141173
	Local Authority Landfill Coverage Name: Kent County Council - Had landfill data but passed it to the relevant environment agency		0	9	579447 141173

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Weald Clay	A13SE (SE)	0	3	579447 141173
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (SE)	0	4	579447 141173
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (S)	12	4	579447 141123
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (SE)	134	4	579562 141014
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (S)	135	4	579447 141000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (SE)	140	4	579543 141000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (N)	146	4	579418 141361

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (NW)	179	4	579263 141337
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (N)	322	4	579470 141530
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	381	4	579000 141173
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	382	4	579000 141127
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NE (W)	382	4	579000 141175
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	411	4	579000 141000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	416	4	578966 141128
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	437	4	578947 141099
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NE (W)	438	4	578961 141295
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (N)	439	4	579568 141630
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A8NE (S)	464	4	579480 140671
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NE (NW)	475	4	579000 141481

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	477	4	578930 141000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	488	4	580000 141173
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	492	4	578890 141128
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	493	4	580000 141116
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	493	4	580000 141118
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	504	4	579991 141000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	513	4	580000 141000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A9NW (SE)	525	4	579898 140786
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	545	4	578858 141000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14NW (NE)	546	4	580000 141439
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	549	4	578858 140985
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (SE)	552	4	580000 140889

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A17SE (NW)	554	4	579000 141605
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A9NW (SE)	557	4	579883 140725
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A9NW (SE)	558	4	579880 140722
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (SE)	577	4	580000 140837
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7NE (SW)	580	4	579000 140716
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	595	4	580085 141000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19SW (NE)	627	4	580000 141586
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SE (E)	640	4	580131 141000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A8NW (S)	640	4	579402 140503
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A17SE (NW)	660	4	579000 141744
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SE (E)	675	4	580183 141117
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SE (E)	696	4	580208 141168

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19SW (NE)	705	4	580000 141702
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SE (E)	744	4	580252 141116
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SE (E)	744	4	580252 141116
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18NE (N)	788	4	579447 142000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19NW (NE)	810	4	579810 141945
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18NE (N)	833	4	579713 142000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SE (E)	866	4	580361 141000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A17NE (NW)	880	4	579000 142000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19NW (NE)	884	4	580000 141929
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19NW (NE)	944	4	580000 142000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A15SW (E)	971	4	580480 141114
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	146	3	579418 141361
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	146	3	579418 141361
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	134	3	579562 141014
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	146	3	579418 141361
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	3	579447 141173

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
41	**Contemporary Trade Directory Entries** Name: Mobitech Fork Lift Trucks Location: Grandshore Wood Farm, Grandshore Lane, Frittenden, Cranbrook, Kent, TN17 2BZ Classification: Fork Lift Trucks **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SE (S)	886	-	579719 140276

Sensitive Land Use

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
42	**Nitrate Vulnerable Zones** Name: Not Supplied Description: Surface Water Source: Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	A13SE (SE)	0	6	579447 141173

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Maidstone Borough Council - Environmental Health Department	January 2013	Annual Rolling Update
Ashford Borough Council - Environmental Health Department	May 2013	Annual Rolling Update
Tunbridge Wells Borough Council - Environmental Health Department	October 2013	Annual Rolling Update
Discharge Consents		
Environment Agency - Southern Region	August 2014	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Southern Region	March 2013	As notified
Integrated Pollution Controls		
Environment Agency - Southern Region	October 2008	Not Applicable
Integrated Pollution Prevention And Control		
Environment Agency - South East Region - Kent & South London Area	August 2014	Quarterly
Environment Agency - Southern Region	August 2014	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Tunbridge Wells Borough Council - Environmental Health Department	August 2013	Annual Rolling Update
Ashford Borough Council - Environmental Health Department	June 2014	Annual Rolling Update
Maidstone Borough Council - Environmental Health Department	May 2012	Annual Rolling Update
Local Authority Pollution Prevention and Controls		
Maidstone Borough Council - Environmental Health Department	April 2013	Annual Rolling Update
Tunbridge Wells Borough Council - Environmental Health Department	August 2013	Annual Rolling Update
Ashford Borough Council - Environmental Health Department	June 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Maidstone Borough Council - Environmental Health Department	April 2013	Annual Rolling Update
Tunbridge Wells Borough Council - Environmental Health Department	August 2013	Annual Rolling Update
Ashford Borough Council - Environmental Health Department	June 2014	Annual Rolling Update
Nearest Surface Water Feature		
Ordnance Survey	July 2012	Quarterly
Pollution Incidents to Controlled Waters		
Environment Agency - Southern Region	December 1999	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - Southern Region	March 2013	As notified
Prosecutions Relating to Controlled Waters		
Environment Agency - Southern Region	March 2013	As notified
Registered Radioactive Substances		
Environment Agency - Southern Region	August 2014	Quarterly
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points		
Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register		
Environment Agency - Southern Region - Kent Area	August 2014	Quarterly
Environment Agency - Southern Region - Kent and East Sussex	August 2014	Quarterly
Water Abstractions		
Environment Agency - Southern Region	July 2014	Quarterly
Water Industry Act Referrals		
Environment Agency - Southern Region	August 2014	Quarterly
Groundwater Vulnerability		
Environment Agency - Head Office	January 2011	Not Applicable
Drift Deposits		
Environment Agency - Head Office	January 1999	Not Applicable

Data Currency

Agency & Hydrological	Version	Update Cycle
Bedrock Aquifer Designations		
British Geological Survey - National Geoscience Information Service	October 2012	Annually
Superficial Aquifer Designations		
British Geological Survey - National Geoscience Information Service	October 2012	Annually
Source Protection Zones		
Environment Agency - Head Office	August 2014	Quarterly
Extreme Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	August 2014	Quarterly
Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	August 2014	Quarterly
Areas Benefiting from Flood Defences		
Environment Agency - Head Office	August 2014	Quarterly
Flood Water Storage Areas		
Environment Agency - Head Office	August 2014	Quarterly
Flood Defences		
Environment Agency - Head Office	August 2014	Quarterly
Detailed River Network Lines		
Environment Agency - Head Office	March 2012	Annually
Detailed River Network Offline Drainage		
Environment Agency - Head Office	March 2012	Annually
Waste	**Version**	**Update Cycle**
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites		
Environment Agency - Southern Region - Kent Area	May 2014	Quarterly
Environment Agency - Southern Region - Kent and East Sussex	May 2014	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - Southern Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - Southern Region - Kent Area	August 2014	Quarterly
Environment Agency - Southern Region - Kent and East Sussex	August 2014	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - Southern Region - Kent Area	August 2014	Quarterly
Environment Agency - Southern Region - Kent and East Sussex	August 2014	Quarterly
Local Authority Landfill Coverage		
Ashford Borough Council - Environmental Health Department	May 2000	Not Applicable
Kent County Council - Waste Management Group	May 2000	Not Applicable
Maidstone Borough Council - Environmental Health Department	May 2000	Not Applicable
Tunbridge Wells Borough Council - Environmental Health Department	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Maidstone Borough Council - Environmental Health Department	February 2004	Not Applicable
Ashford Borough Council - Environmental Health Department	May 2000	Not Applicable
Kent County Council - Waste Management Group	May 2000	Not Applicable
Tunbridge Wells Borough Council - Environmental Health Department	May 2000	Not Applicable
Registered Landfill Sites		
Environment Agency - Southern Region - Kent Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - Southern Region - Kent Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - Southern Region - Kent Area	March 2003	Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	August 2014	Bi-Annually
Explosive Sites		
Health and Safety Executive	October 2014	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
Ashford Borough Council	August 2013	Annual Rolling Update
Kent County Council	September 2013	Annual Rolling Update
Maidstone Borough Council	September 2014	Annual Rolling Update
Tunbridge Wells Borough Council - Planning Department	September 2014	Annual Rolling Update
Planning Hazardous Substance Consents		
Ashford Borough Council	August 2013	Annual Rolling Update
Kent County Council	September 2013	Annual Rolling Update
Maidstone Borough Council	September 2014	Annual Rolling Update
Tunbridge Wells Borough Council - Planning Department	September 2014	Annual Rolling Update

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology		
British Geological Survey - National Geoscience Information Service	August 1996	Not Applicable
BGS Estimated Soil Chemistry		
British Geological Survey - National Geoscience Information Service	January 2010	Annually
BGS Recorded Mineral Sites		
British Geological Survey - National Geoscience Information Service	April 2014	Bi-Annually
Brine Compensation Area		
Cheshire Brine Subsidence Compensation Board	August 2011	Not Applicable
Coal Mining Affected Areas		
The Coal Authority - Mining Report Service	December 2013	As notified
Mining Instability		
Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain		
British Geological Survey - National Geoscience Information Service	July 2014	Not Applicable
Potential for Collapsible Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Compressible Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Ground Dissolution Stability Hazards		
British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Landslide Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Running Sand Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	June 2014	Annually
Radon Potential - Radon Affected Areas		
British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures		
British Geological Survey - National Geoscience Information Service	July 2011	Annually

Data Currency

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	August 2014	Quarterly
Fuel Station Entries Catalist Ltd - Experian	August 2014	Quarterly
Sensitive Land Use	**Version**	**Update Cycle**
Areas of Adopted Green Belt Maidstone Borough Council Tunbridge Wells Borough Council	 August 2014 August 2014	 As notified As notified
Areas of Unadopted Green Belt Maidstone Borough Council Tunbridge Wells Borough Council	 August 2014 August 2014	 As notified As notified
Areas of Outstanding Natural Beauty Natural England	August 2014	Bi-Annually
Environmentally Sensitive Areas Natural England	August 2014	Annually
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	October 2014	Bi-Annually
Marine Nature Reserves Natural England	July 2013	Bi-Annually
National Nature Reserves Natural England	September 2014	Bi-Annually
National Parks Natural England	August 2014	Bi-Annually
Nitrate Sensitive Areas Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	February 2012	Not Applicable
Nitrate Vulnerable Zones Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	July 2014	Annually
Ramsar Sites Natural England	March 2014	Bi-Annually
Sites of Special Scientific Interest Natural England	September 2014	Bi-Annually
Special Areas of Conservation Natural England	March 2014	Bi-Annually
Special Protection Areas Natural England	September 2014	Bi-Annually

Data Suppliers

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Useful Contacts

Contact	Name and Address	Contact Details
2	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 08708 506 506 Email: enquiries@environment-agency.gov.uk
3	**British Geological Survey - Enquiry Service** British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
4	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmark.co.uk Website: www.landmarkinfo.co.uk
5	**Natural England** Suite D, Unex House, Bourges Boulevard, Peterborough, Cambridgeshire, PE1 1NG	Telephone: 0845 600 3078 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
6	**Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)** Government Buildings, Otley Road, Lawnswood, Leeds, West Yorkshire, LS16 5QT	Telephone: 0113 2613333 Fax: 0113 230 0879
7	**Tunbridge Wells Borough Council - Environmental Health Department** Town Hall, Royal Tunbridge Wells, Kent, TN1 1RS	Telephone: 01892 526121 Fax: 01892 546387 Website: www.tunbridgewells.gov.uk
8	**Maidstone Borough Council - Environmental Health Department** Maidstone House, King Street, Maidstone, Kent, ME15 6JQ	Telephone: 01622 602000 Fax: 01622 602444 Website: www.maidstone.gov.uk
9	**Kent County Council - Waste Management Group** Block H, The Forstal, Beddow Way, Aylesford, Kent, ME20 7BT	Telephone: 01622 605976 Website: www.kent.gov.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Pylon
Electricity Transmission Line
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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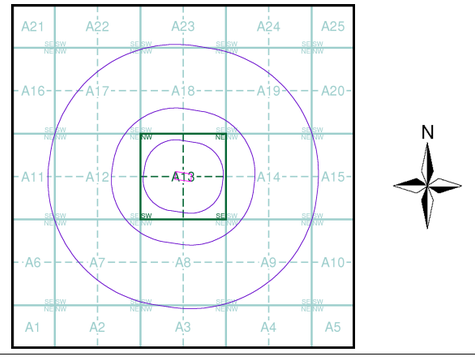
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Kent	1:10,560	1873 - 1876	2
Kent	1:10,560	1898	3
Kent	1:10,560	1909	4
Kent	1:10,560	1938 - 1950	5
Historical Aerial Photography	1:10,560	1945 - 1947	6
Ordnance Survey Plan	1:10,000	1961	7
Ordnance Survey Plan	1:10,000	1972 - 1978	8
Ordnance Survey Plan	1:10,000	1984	9
Ordnance Survey Plan	1:10,000	1990	10
10K Raster Mapping	1:10,000	2006	11
VectorMap Local	1:10,000	2014	12

Historical Map - Slice A



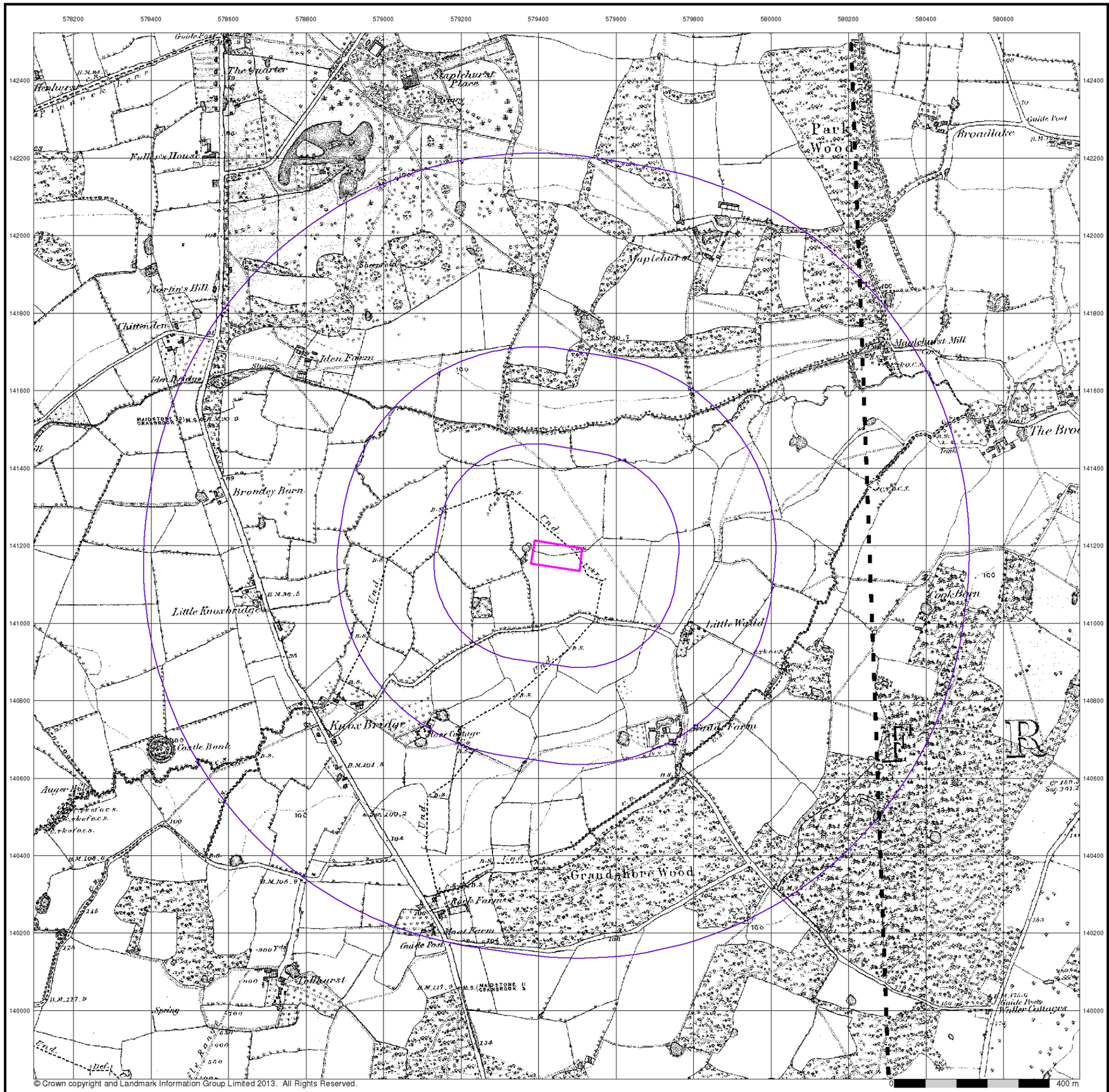
Order Details

Order Number: 61411958_1_1
Customer Ref: Knoxbridge Farm ST14236
National Grid Reference: 579450, 141170
Slice: A
Site Area (Ha): 0.75
Search Buffer (m): 1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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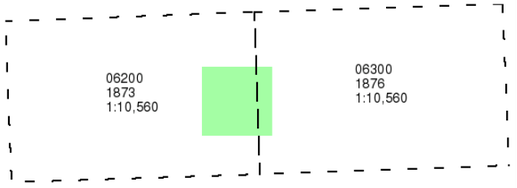
Kent

Published 1873 - 1876

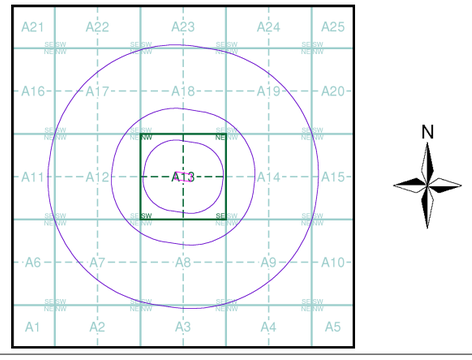
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



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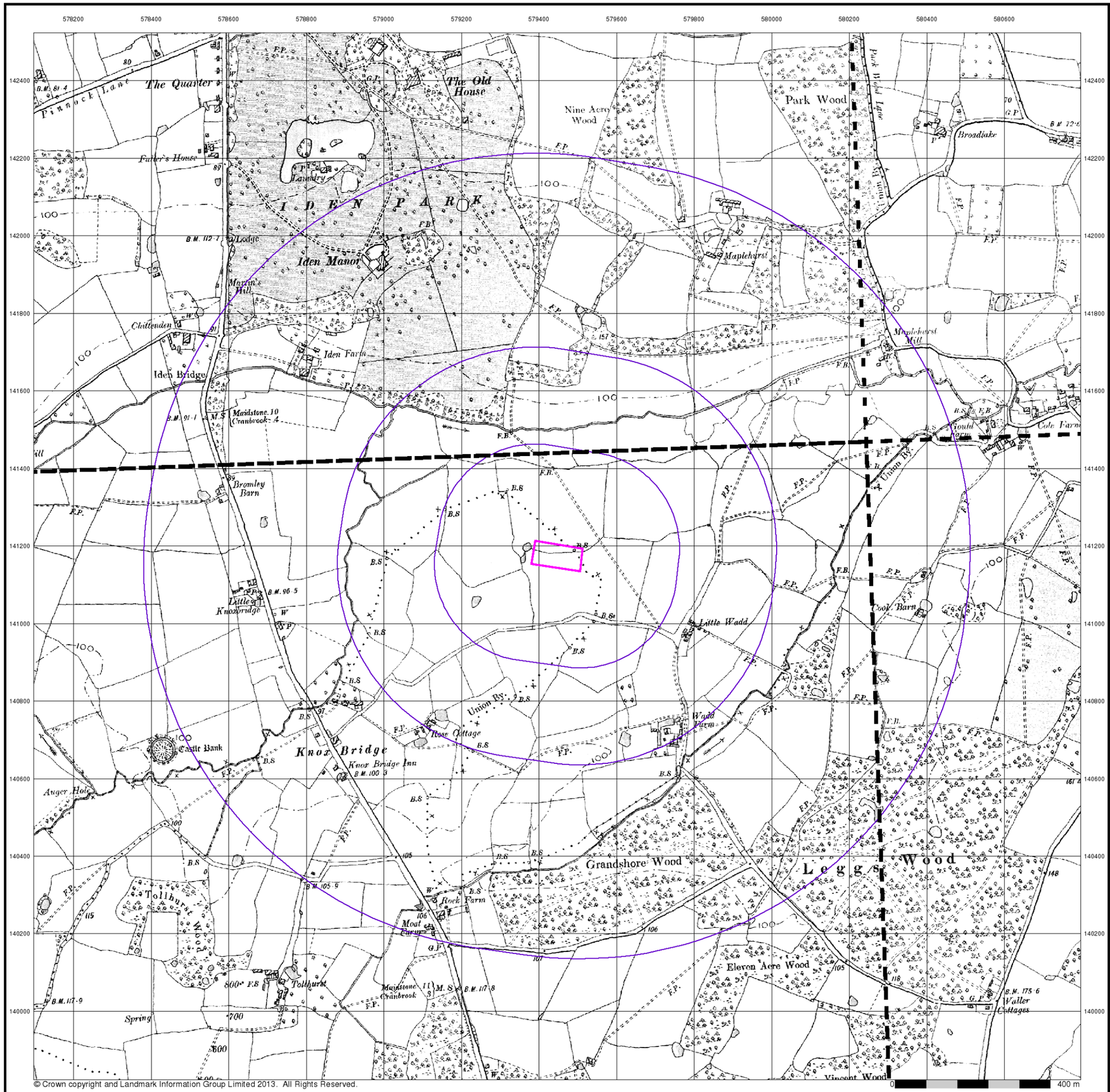

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Kent

Published 1898

Source map scale - 1:10,560

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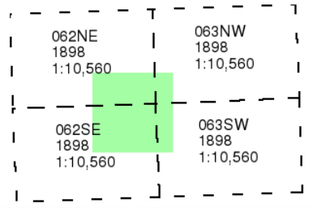
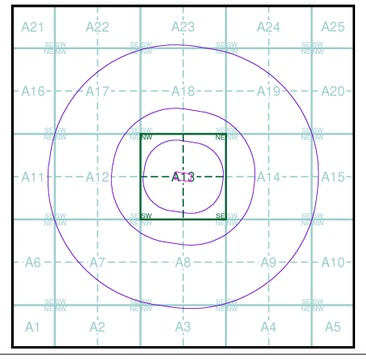


Historical Map - Slice A



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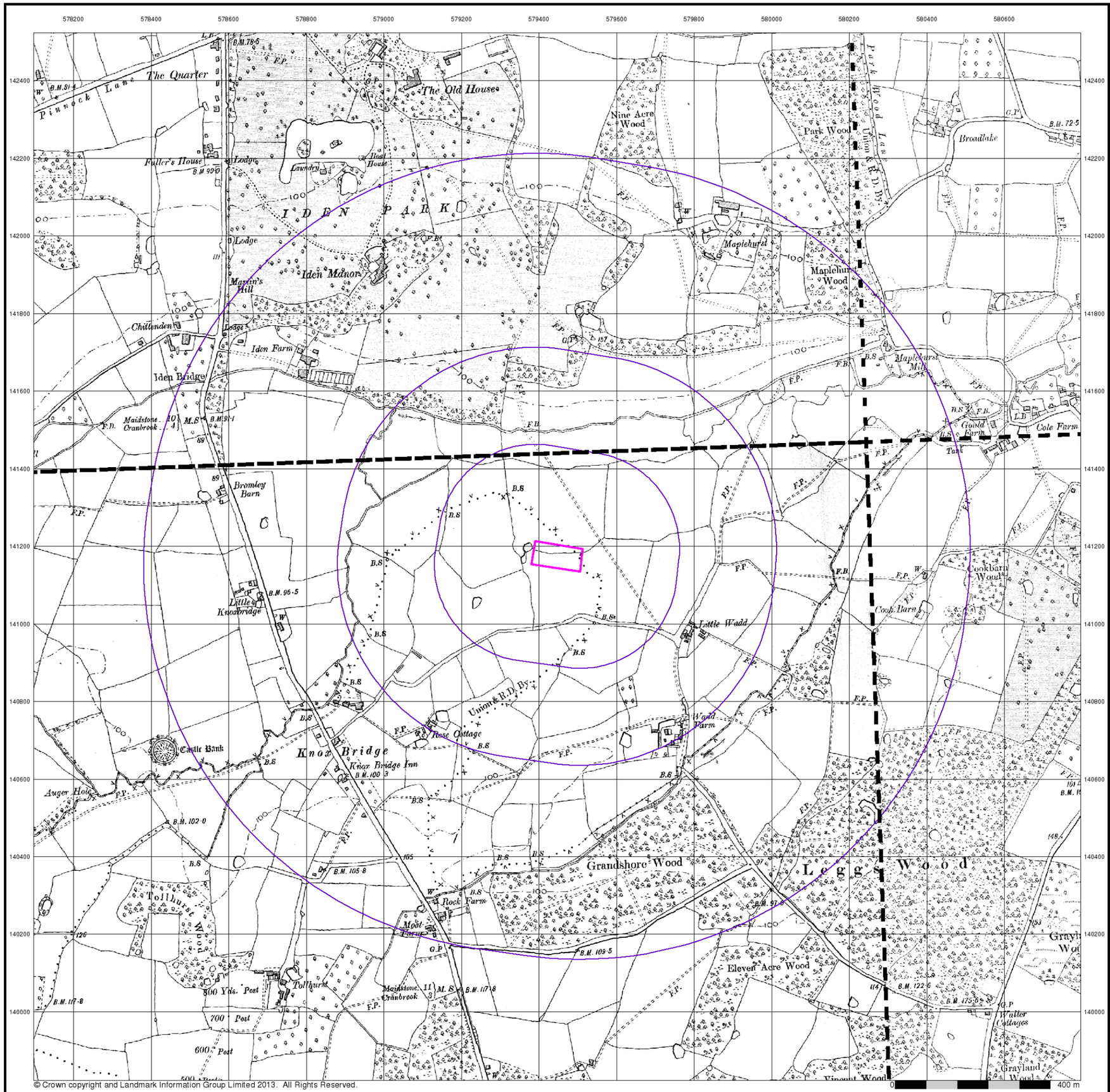

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Kent

Published 1909

Source map scale - 1:10,560

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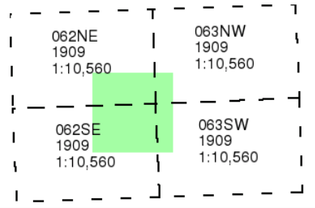
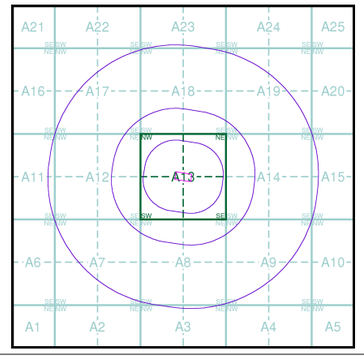


Historical Map - Slice A



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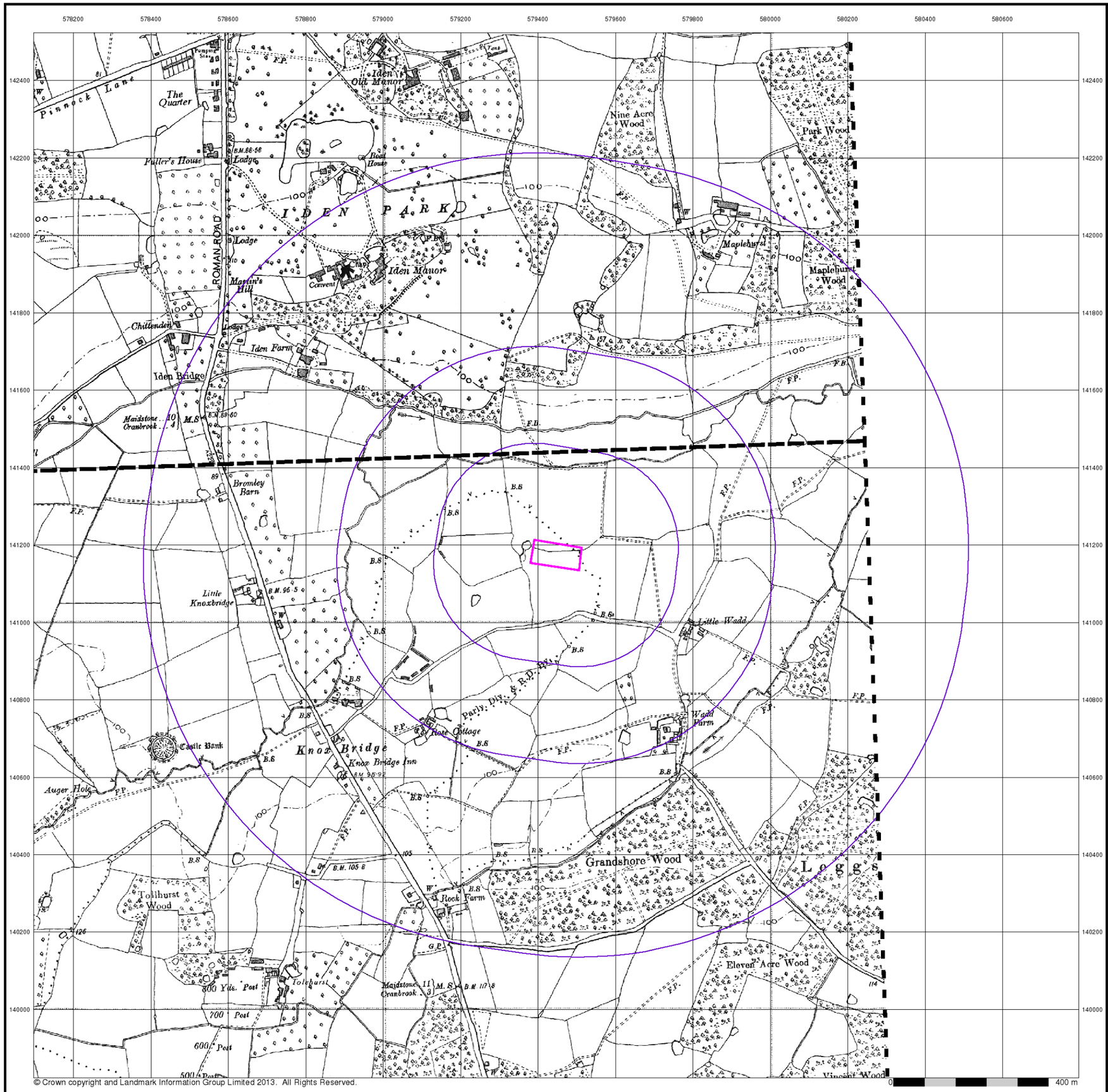

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Kent

Published 1938 - 1950

Source map scale - 1:10,560

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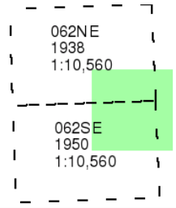
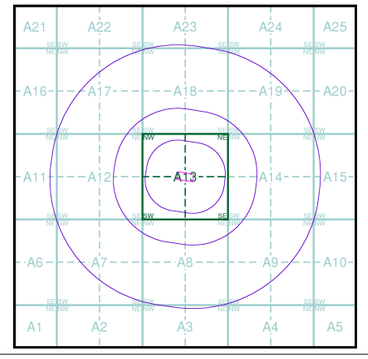
Map Name(s) and Date(s)



Historical Map - Slice A



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Order Number:	61411958_1_1
Customer Ref:	Knoxbridge Farm ST14236
National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
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Site Details

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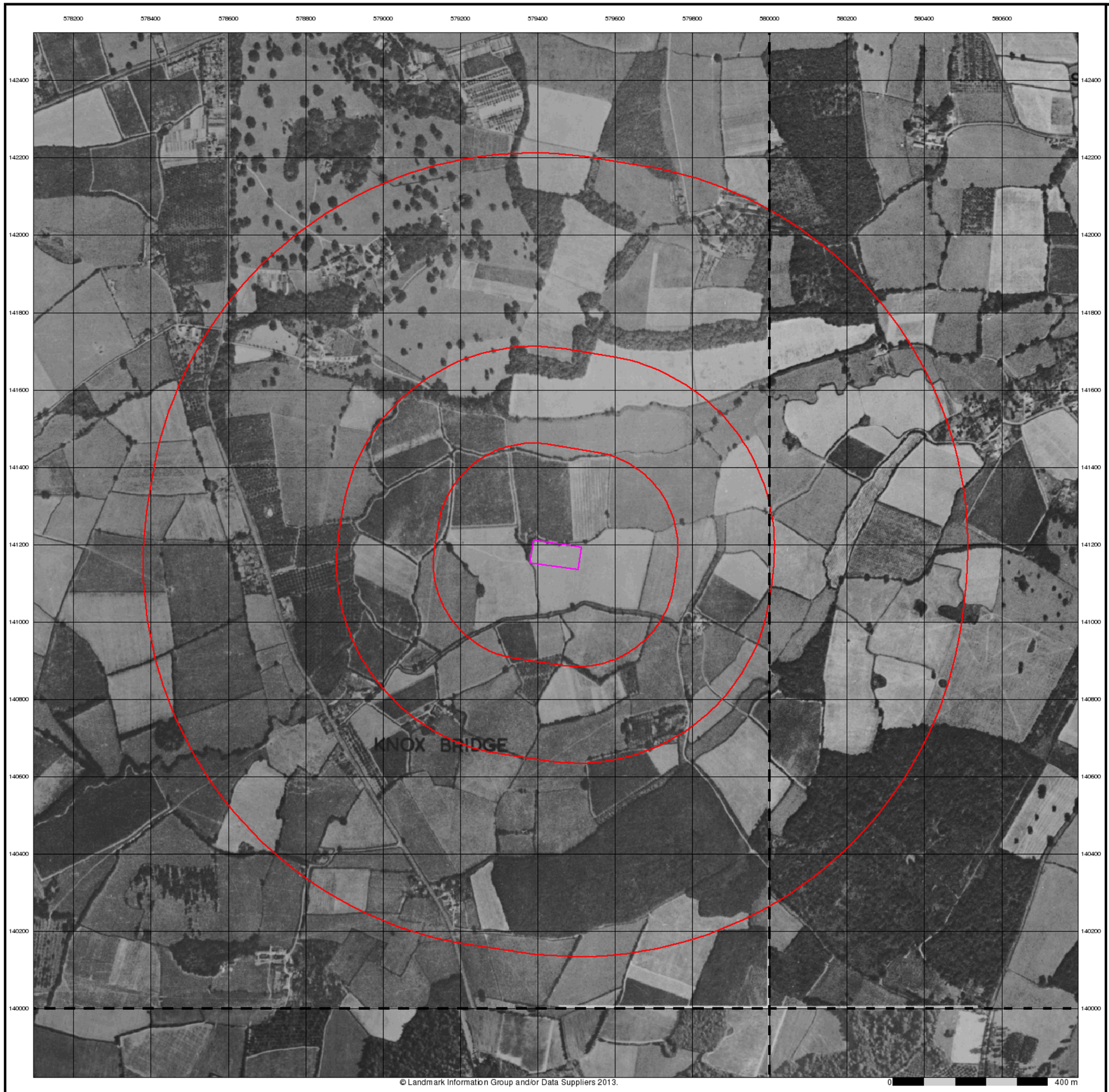

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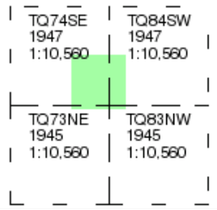
Historical Aerial Photography

Published 1945 - 1947

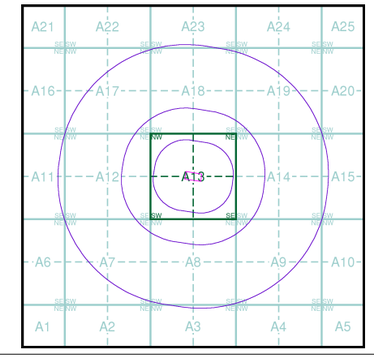
Source map scale - 1:10,560

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



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Order Number:	61411958_1_1
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National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

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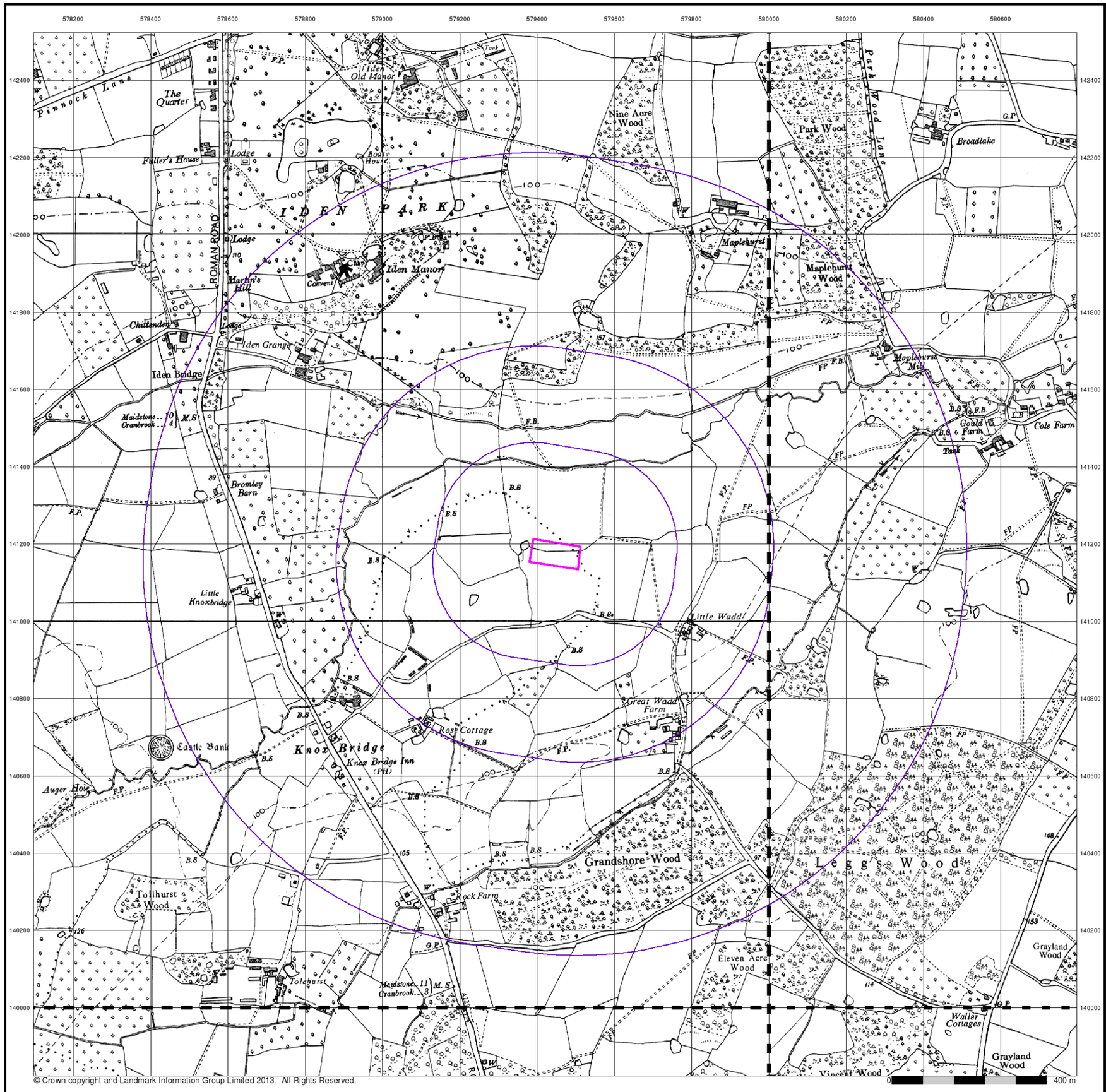

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Ordnance Survey Plan

Published 1961

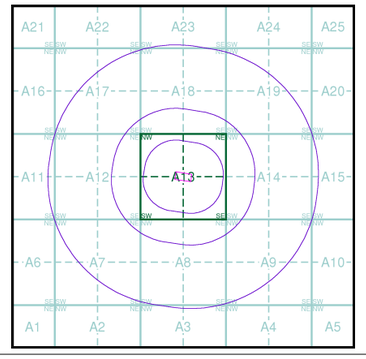
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

TQ74SE 1961 1:10,560	TQ84SW 1961 1:10,560
TQ73NE 1961 1:10,560	TQ83NW 1961 1:10,560

Historical Map - Slice A



Order Details

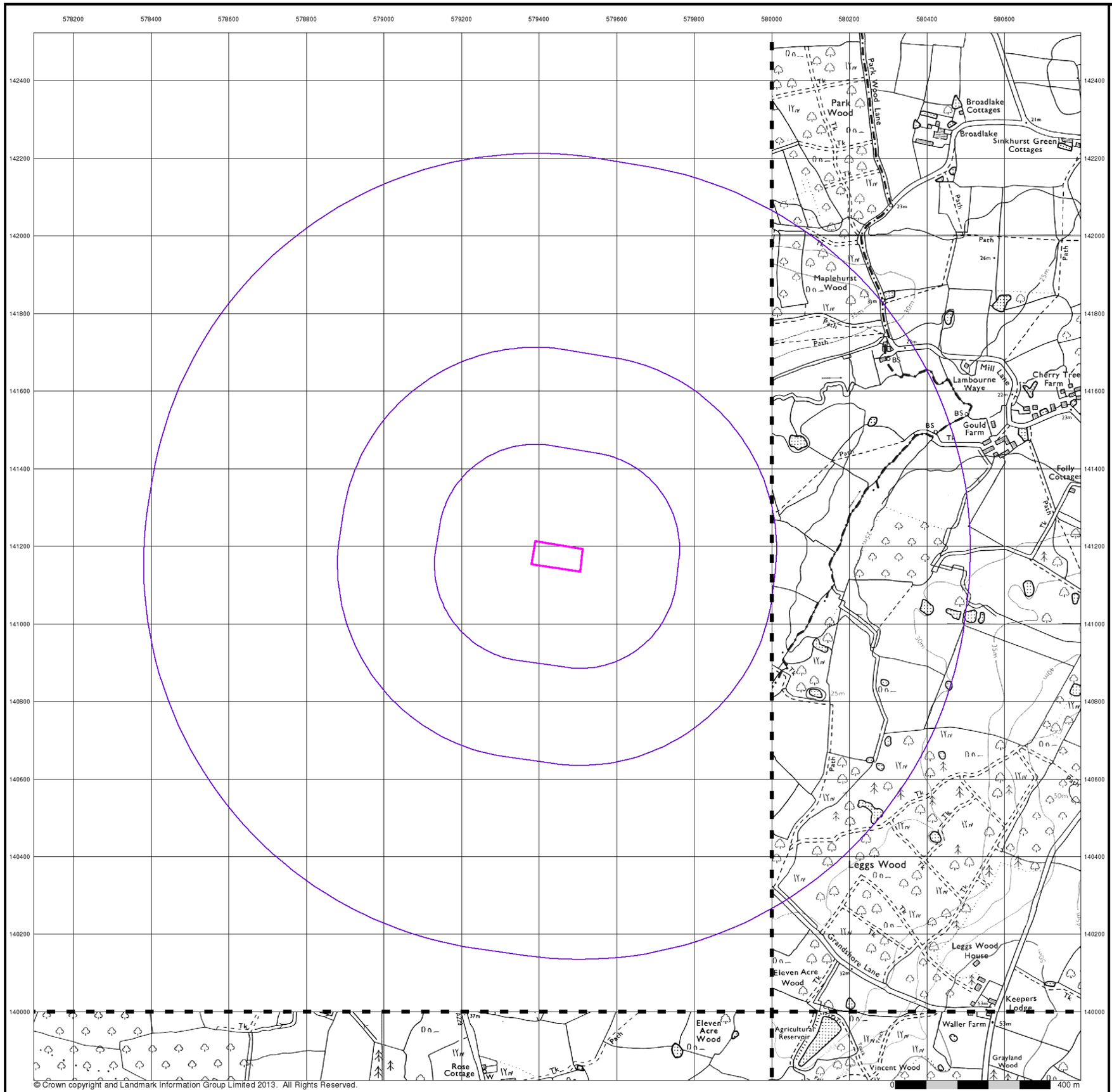
Order Number:	61411958_1_1
Customer Ref:	Knoxbridge Farm ST14236
National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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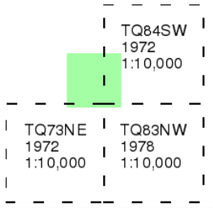
Ordnance Survey Plan

Published 1972 - 1978

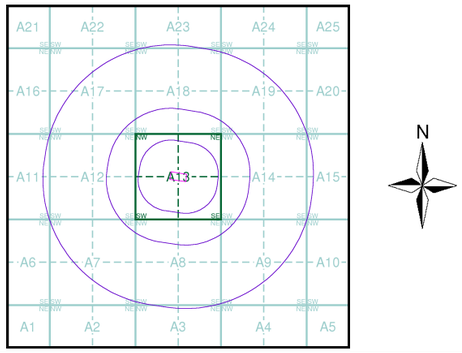
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



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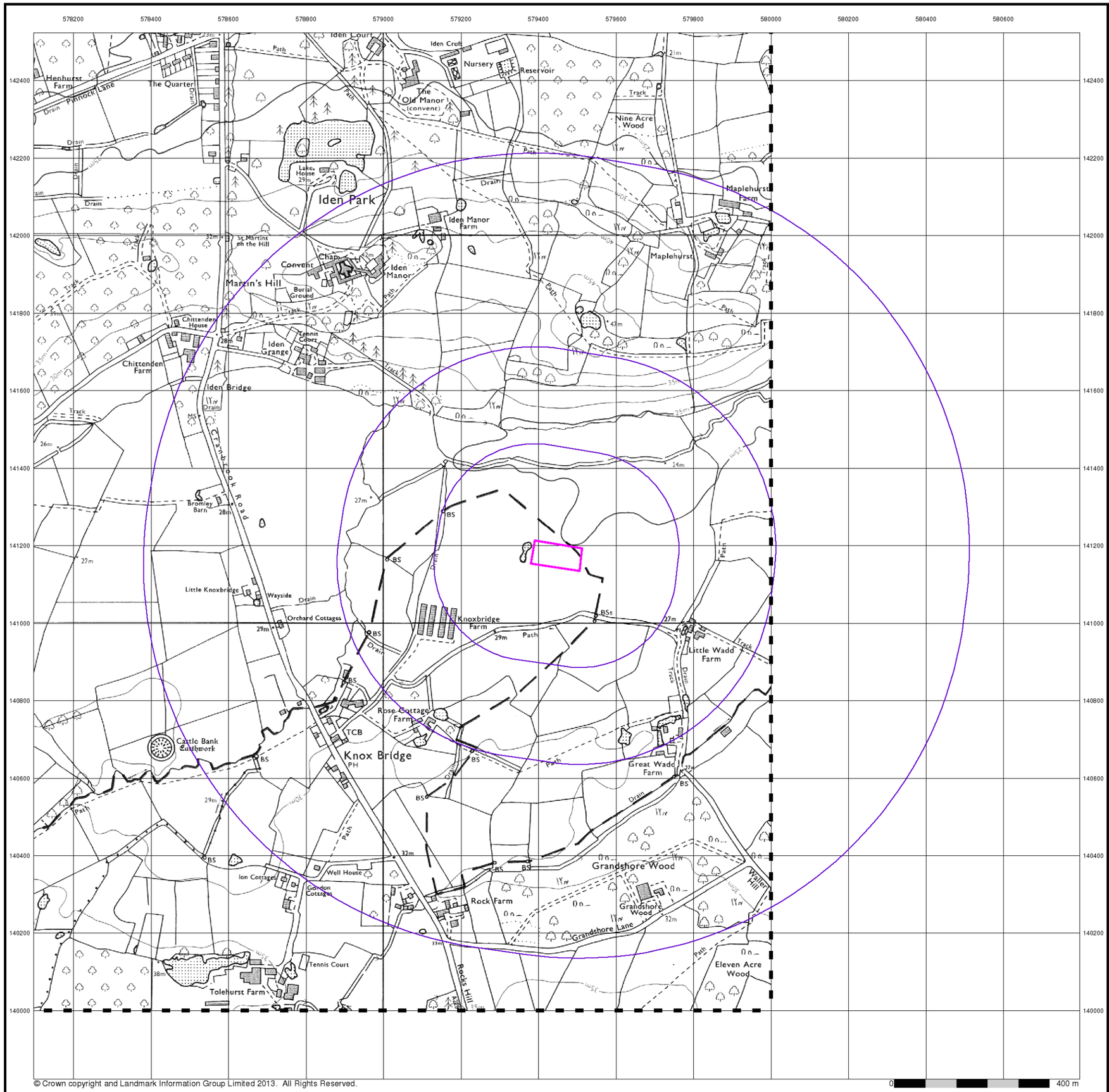

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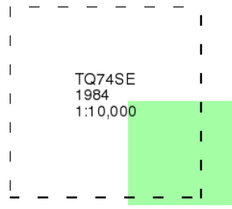
Ordnance Survey Plan

Published 1984

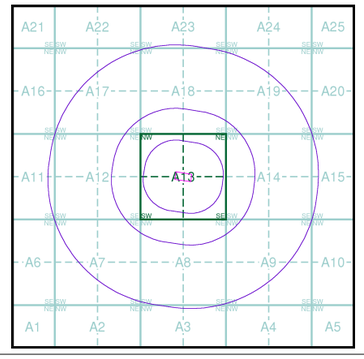
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



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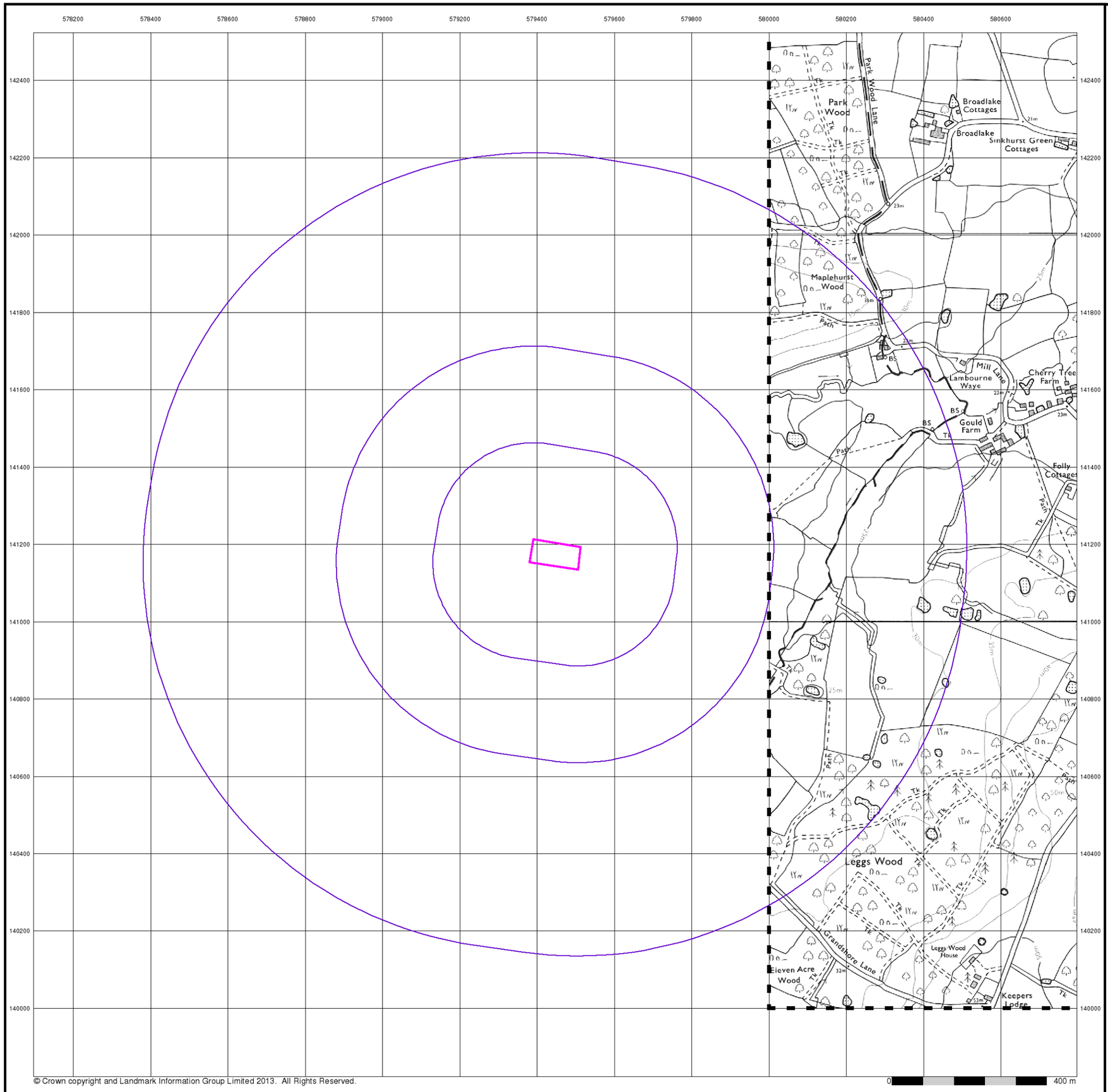

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Ordnance Survey Plan

Published 1990

Source map scale - 1:10,000

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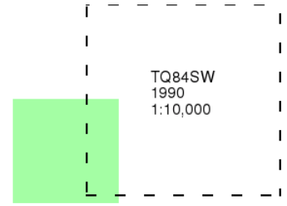
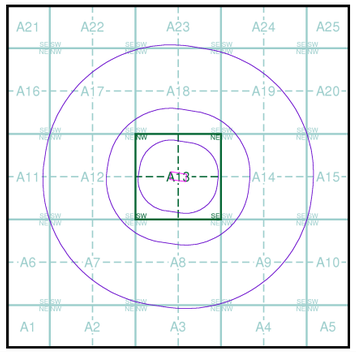
Map Name(s) and Date(s)



Historical Map - Slice A



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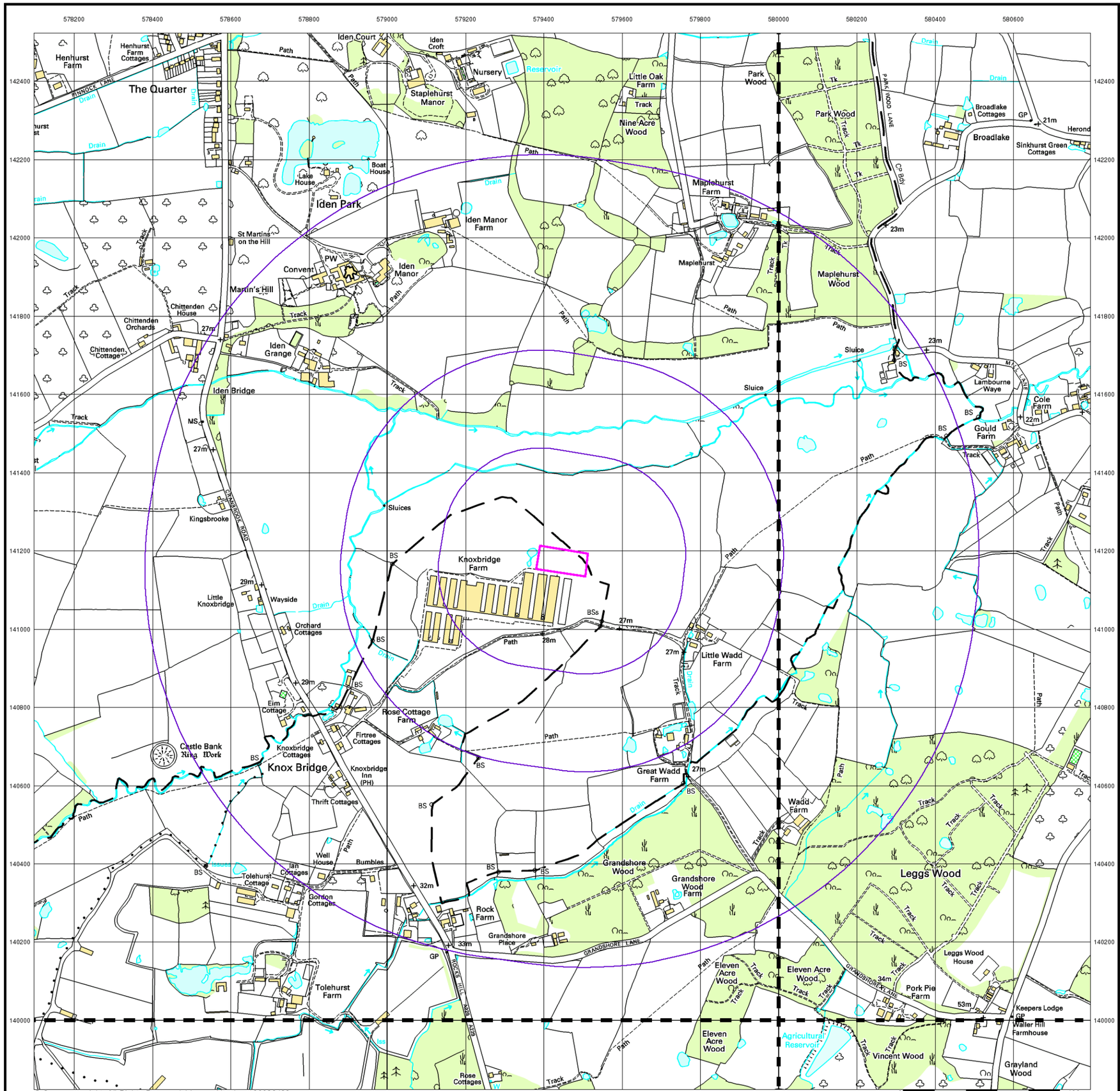

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10k Raster Mapping

Published 2006

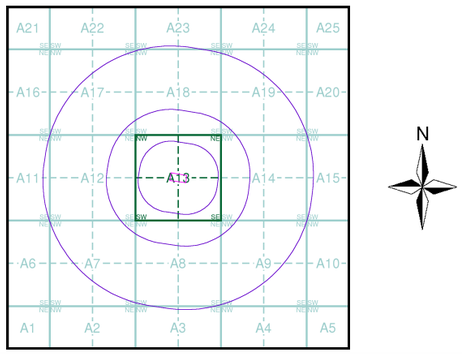
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TQ74SE 2006 1:10,000	TQ84SW 2006 1:10,000
TQ73NE 2006 1:10,000	TQ83NW 2006 1:10,000

Historical Map - Slice A



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Customer Ref:	Knoxbridge Farm ST14236
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Slice:	A
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Search Buffer (m):	1000

Site Details

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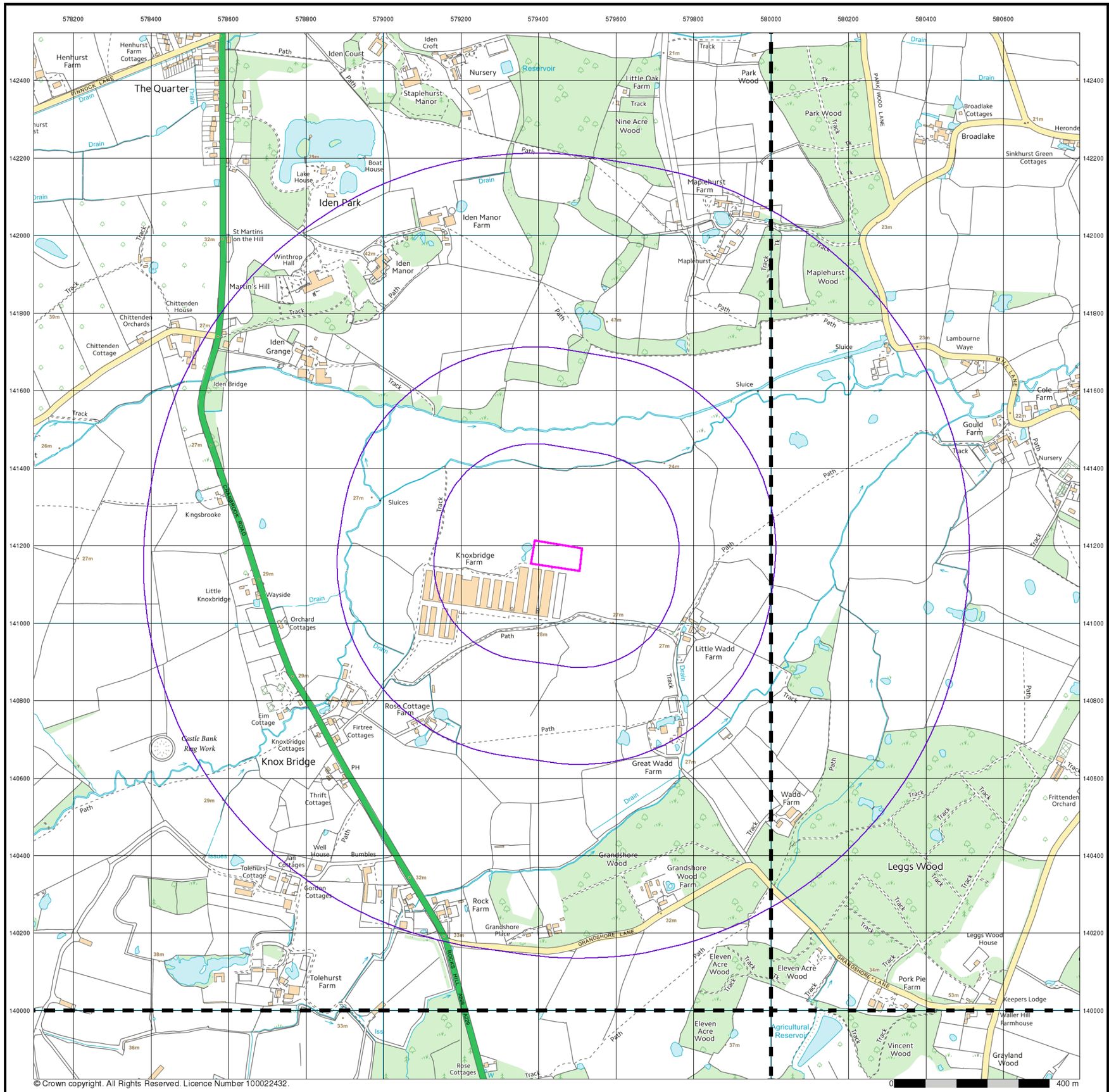

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VectorMap Local

Published 2014

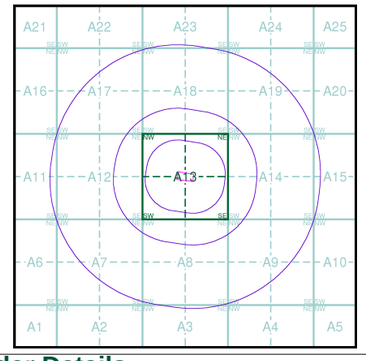
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

TQ74SE 2014 Variable	TQ84SW 2014 Variable
TQ73NE 2014 Variable	TQ83NW 2014 Variable

Historical Map - Slice A



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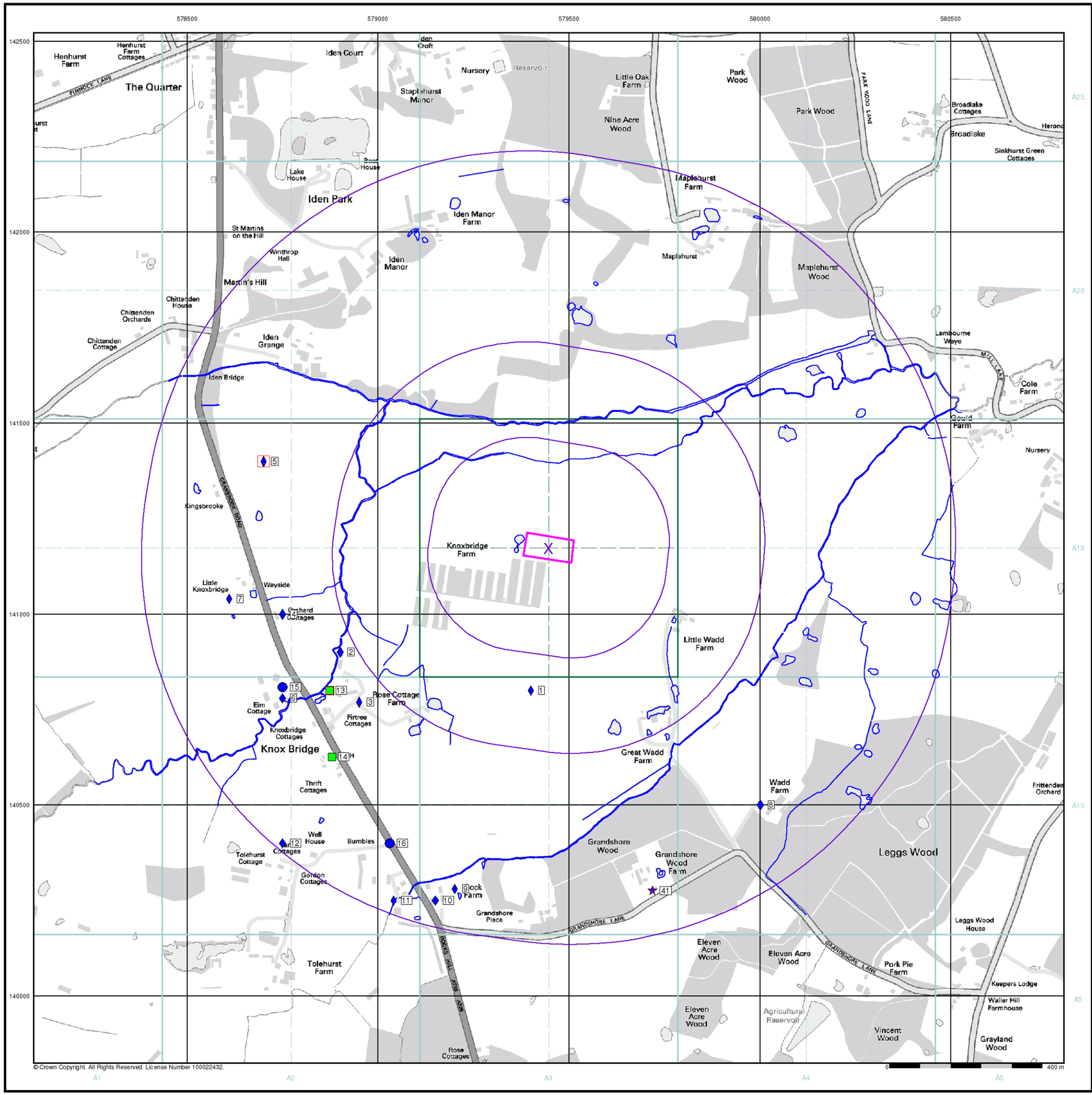

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General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

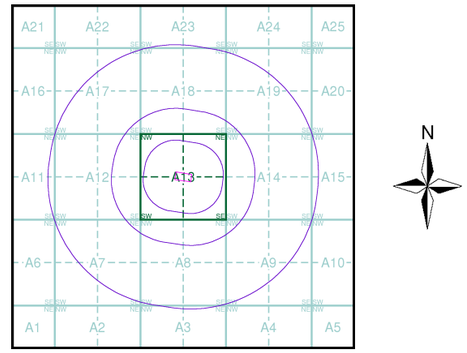
Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Slice A



Order Details

Order Number:	61411958_1_1
Customer Ref:	Knoxbridge Farm ST14236
National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

Landmark® Information Group

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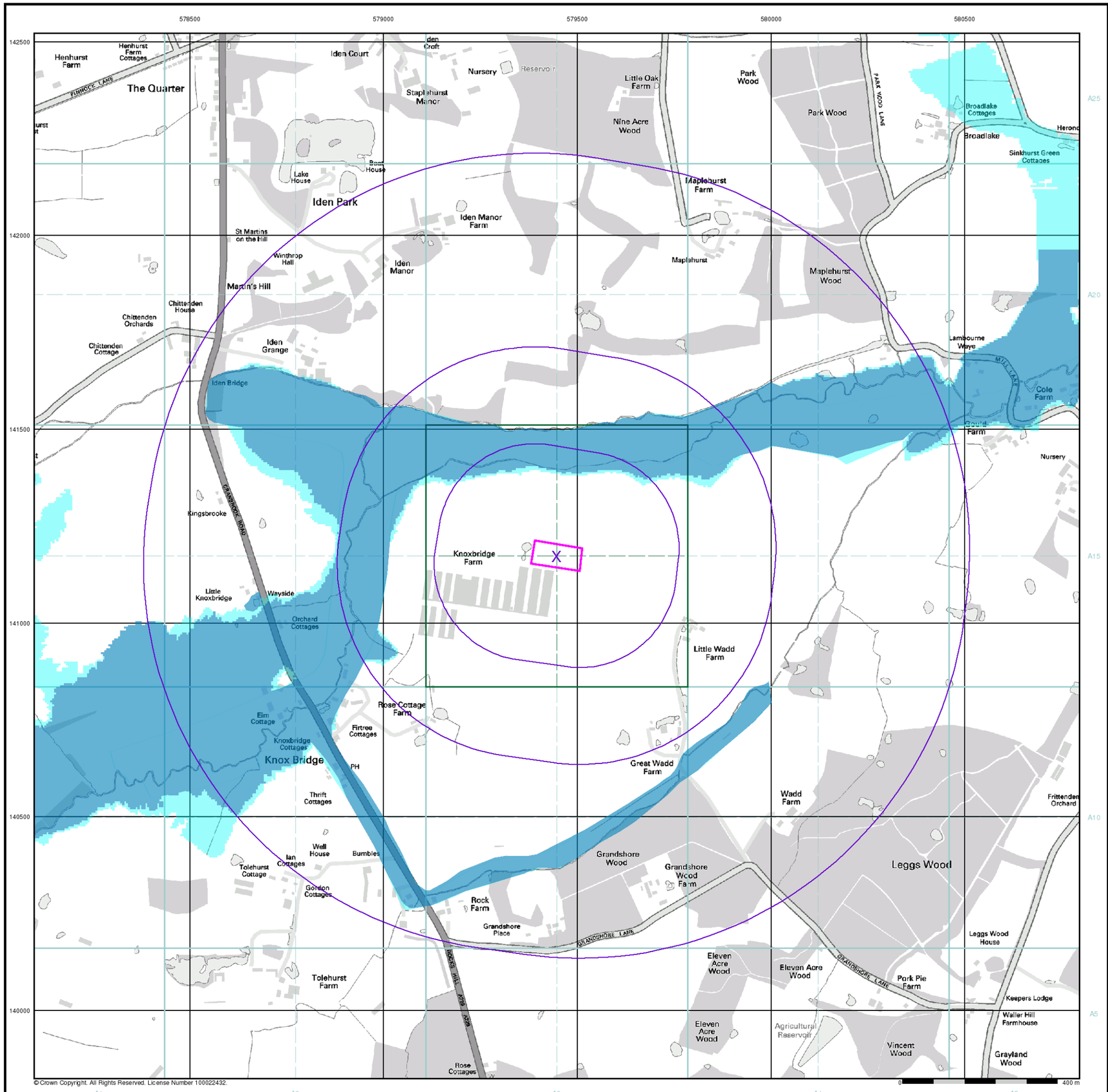

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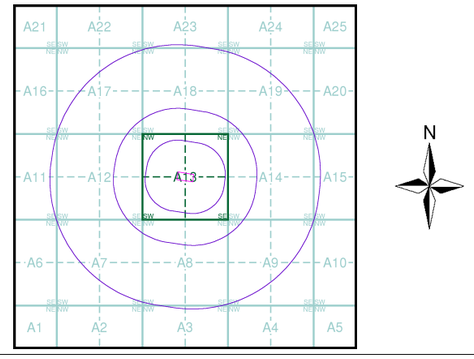
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



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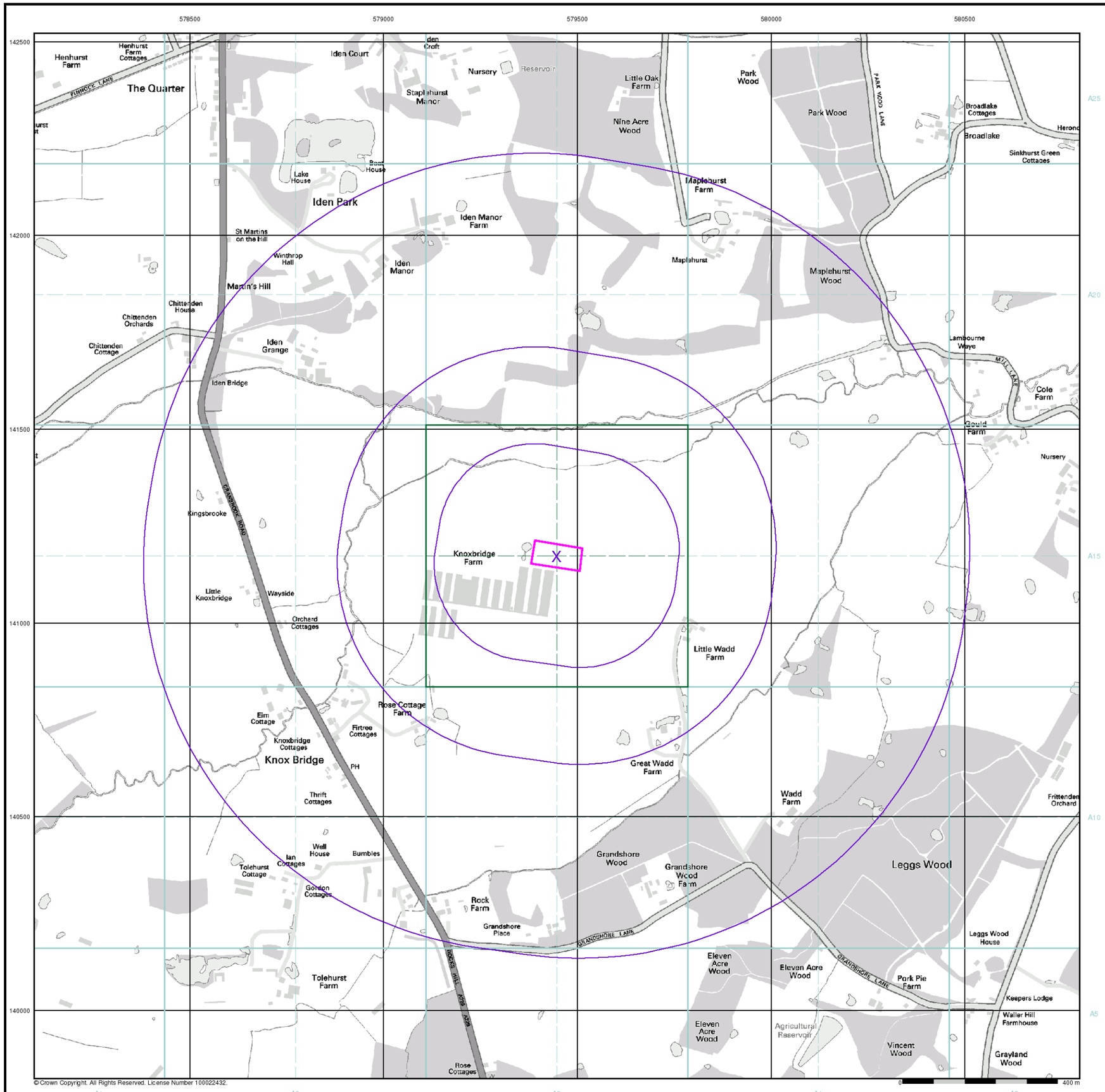

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

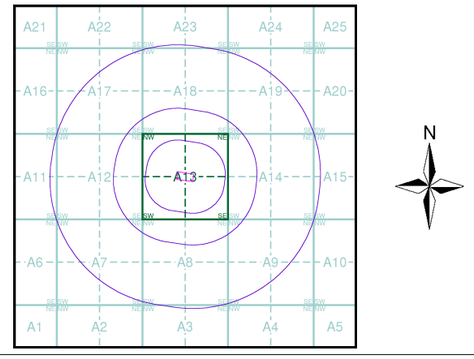
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



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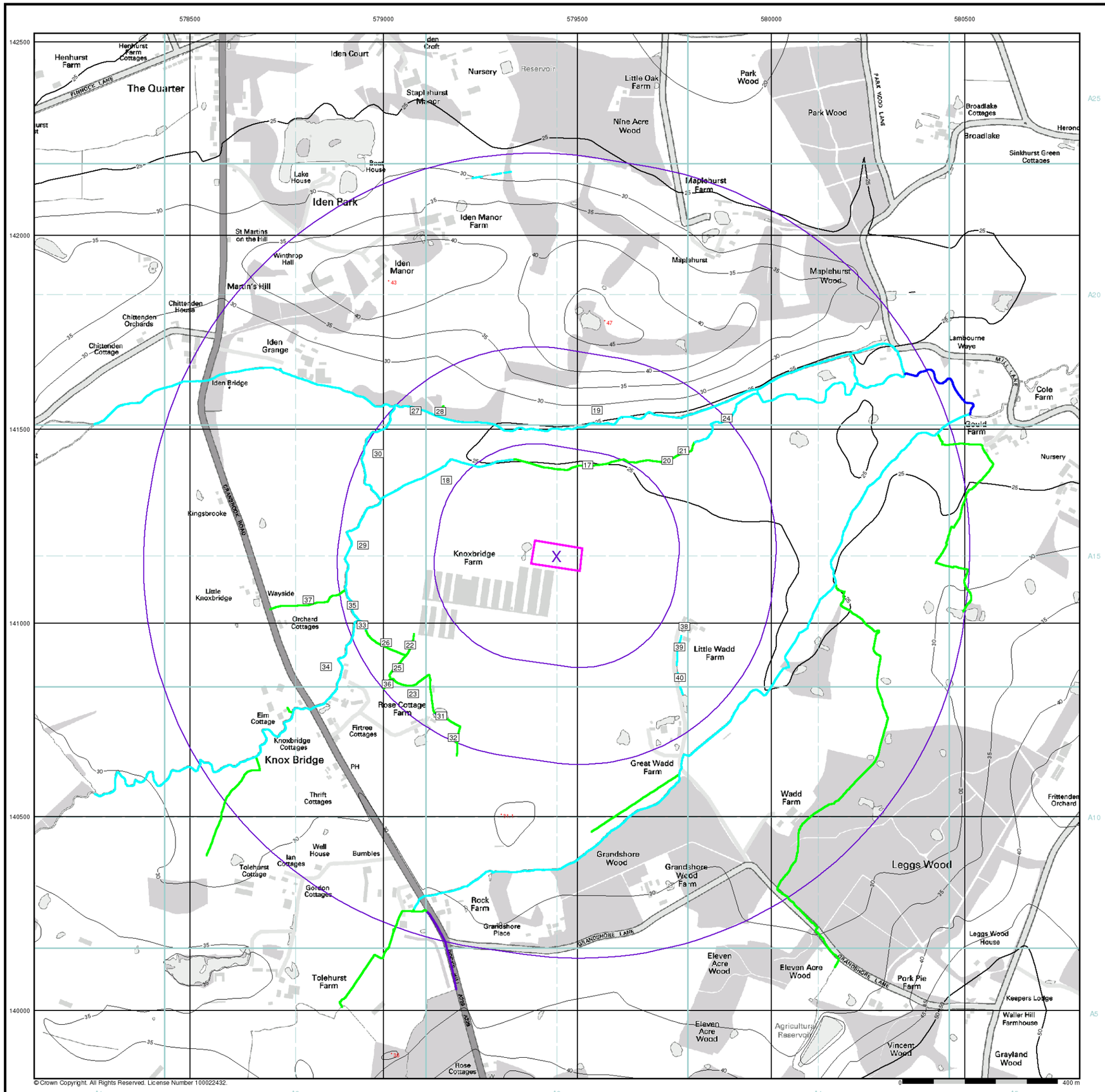

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID

Detailed River Network Data

- Primary River
- Secondary River
- Tertiary River
- Canal
- Canal Tunnel
- Undefined River
- Lake/Reservoir
- Offline Drainage Feature
- Extended Culvert (greater than 50m)
- Underground River (inferred)
- Underground River (local knowledge)
- Downstream of High Water Mark
- Downstream of Seaward Extension
- Not assigned River feature

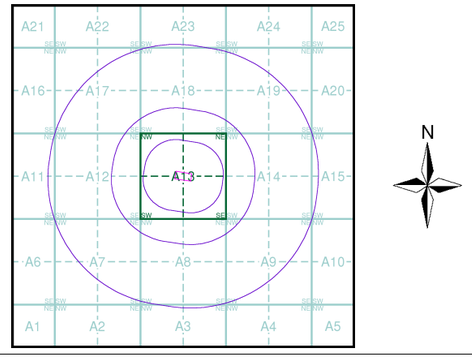
Contours (height in metres)

Standard Contour 105 100 95 — MLW Mean Low Water

Master Contour — MHW Mean High Water

Spot Height *167.3

EA/NRW Detailed River Network Map - Slice A



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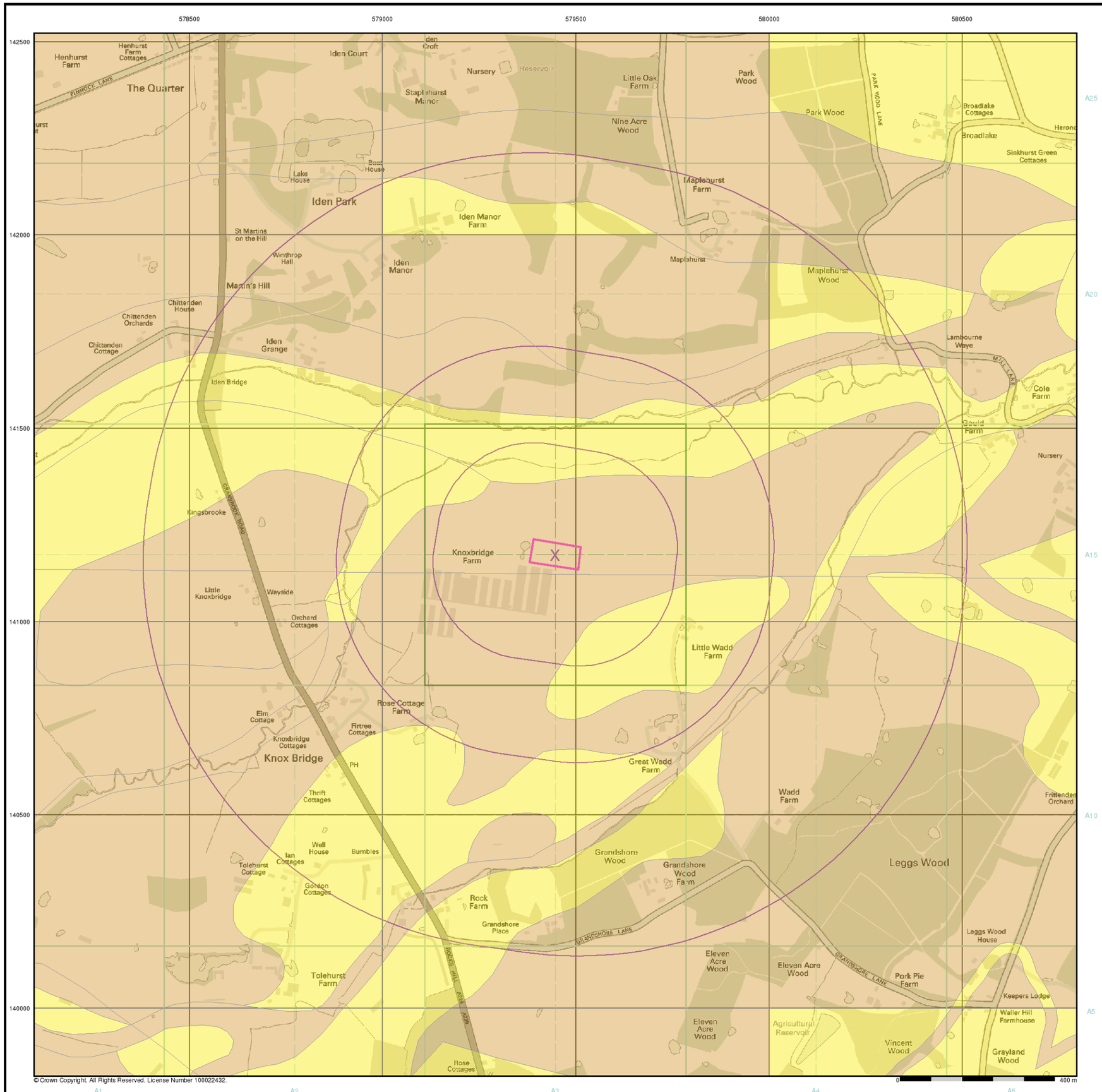

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General

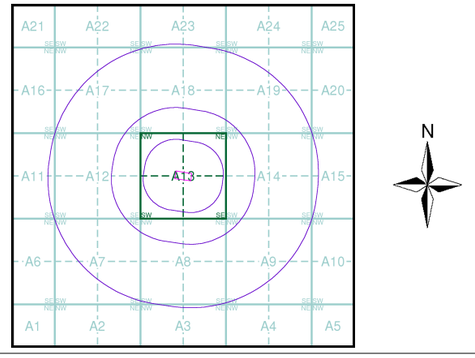
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

Estimated Soil Chemistry Arsenic - Slice A



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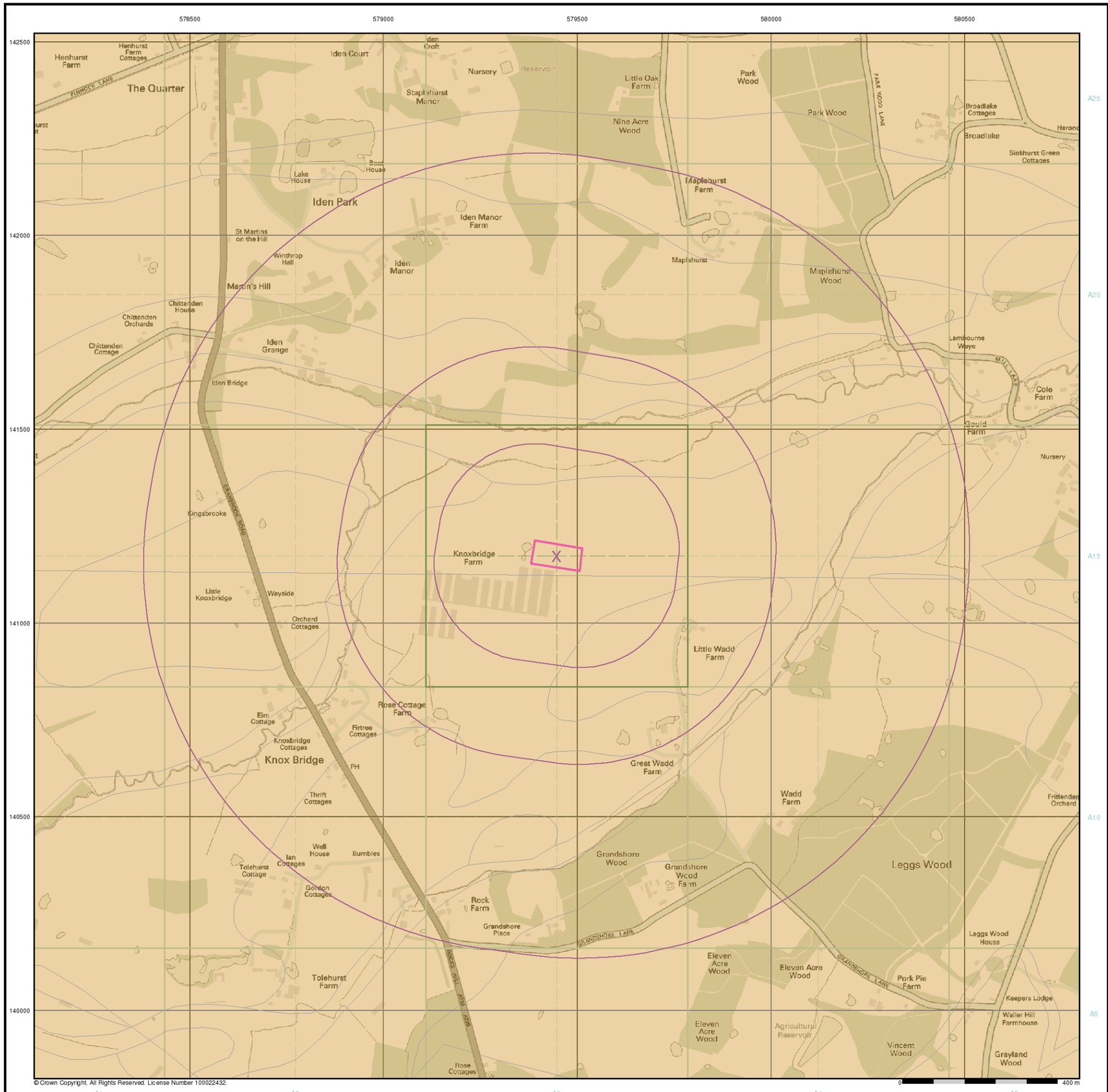

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General

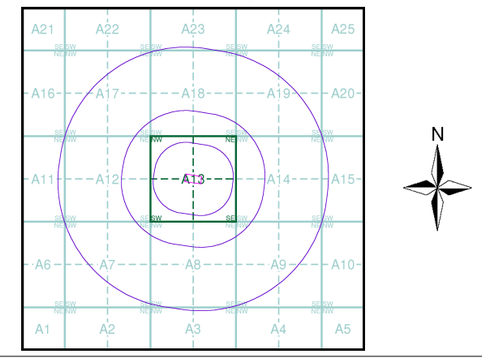
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg

- < 1.8
- 1.8 - 2.2
- 2.2 - 3.0
- > 3.0

Estimated Soil Chemistry Cadmium - Slice A



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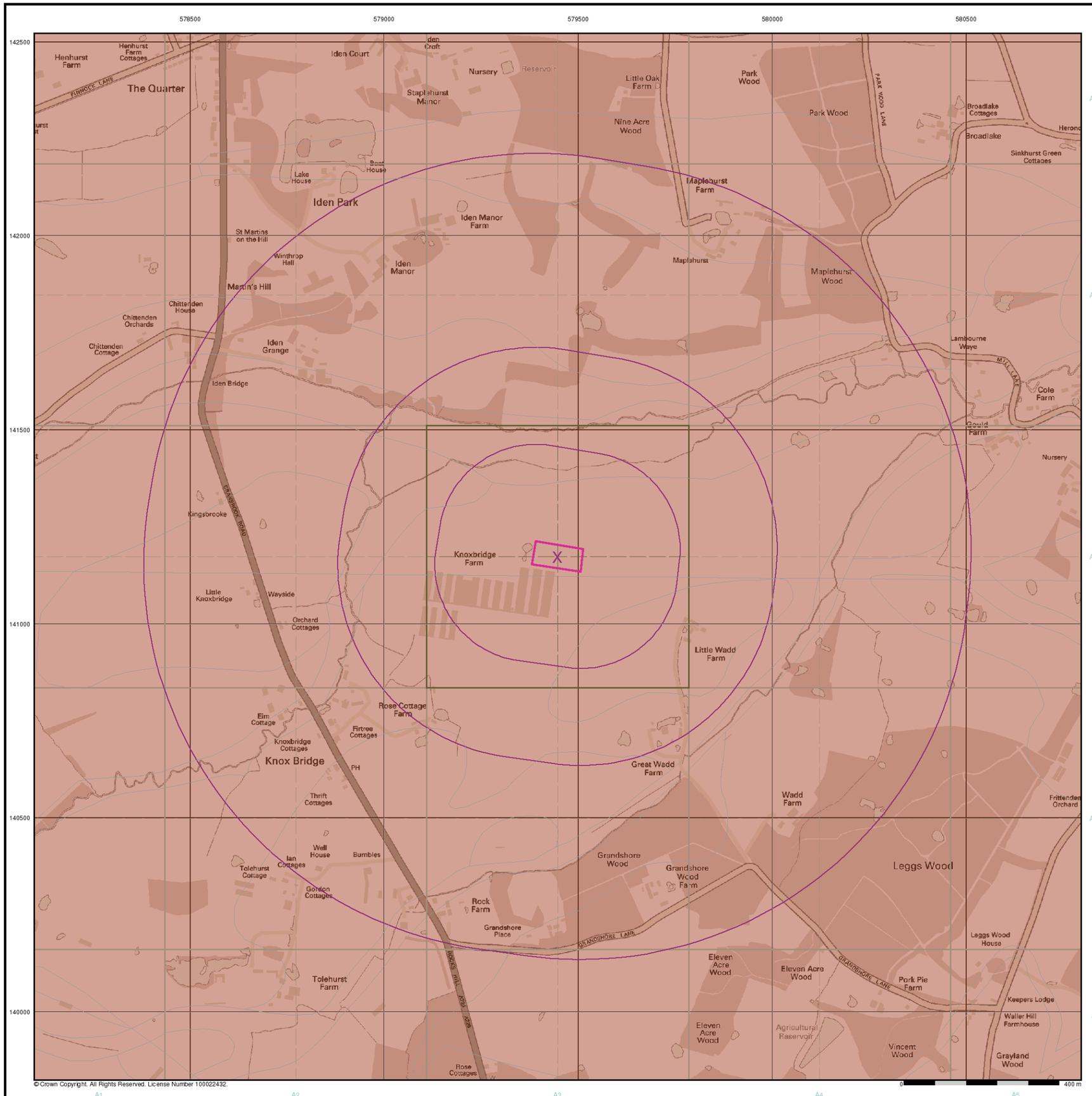

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General

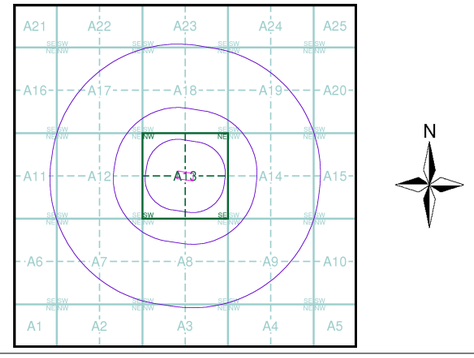
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

Estimated Soil Chemistry Chromium - Slice A



Order Details

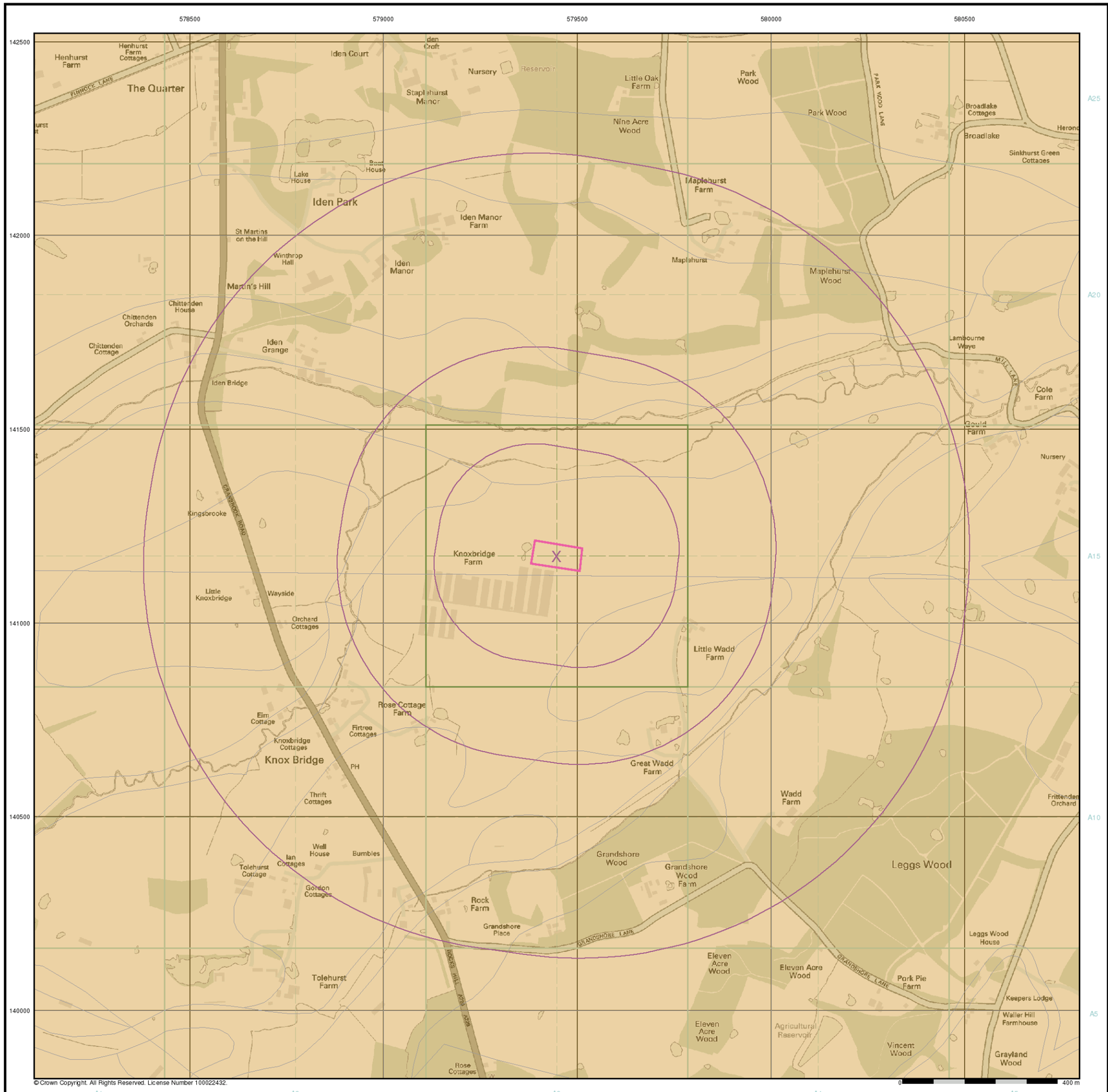
Order Details:	61411958_1_1
Customer Ref:	Knoxbridge Farm ST14236
National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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General

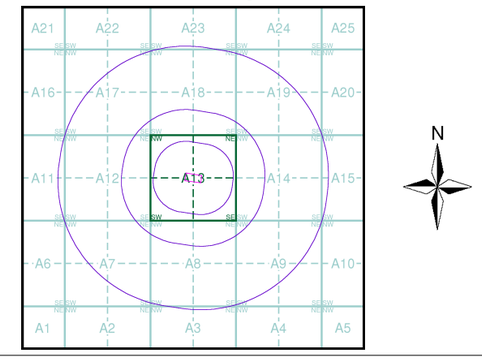
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

- < 150
- 150 - 300
- 300 - 600
- 600 - 900
- > 900

Estimated Soil Chemistry Lead - Slice A



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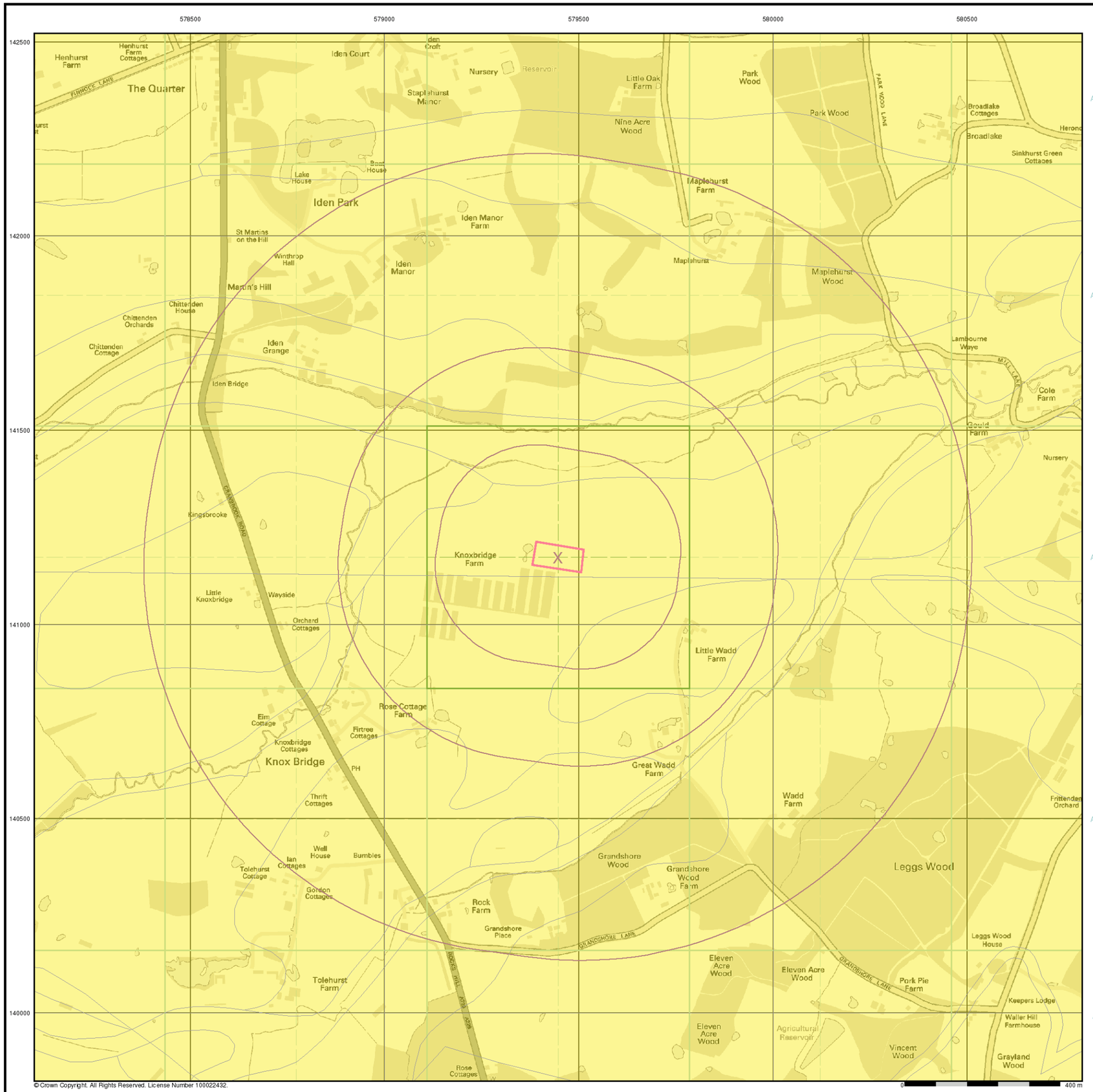

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General

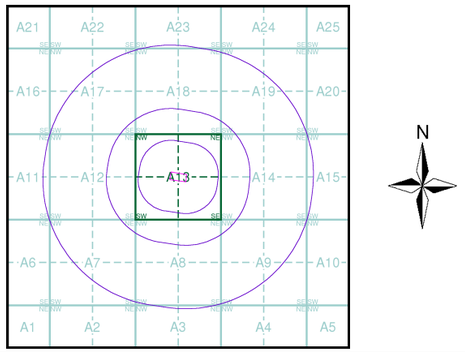
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

Estimated Soil Chemistry Nickel - Slice A



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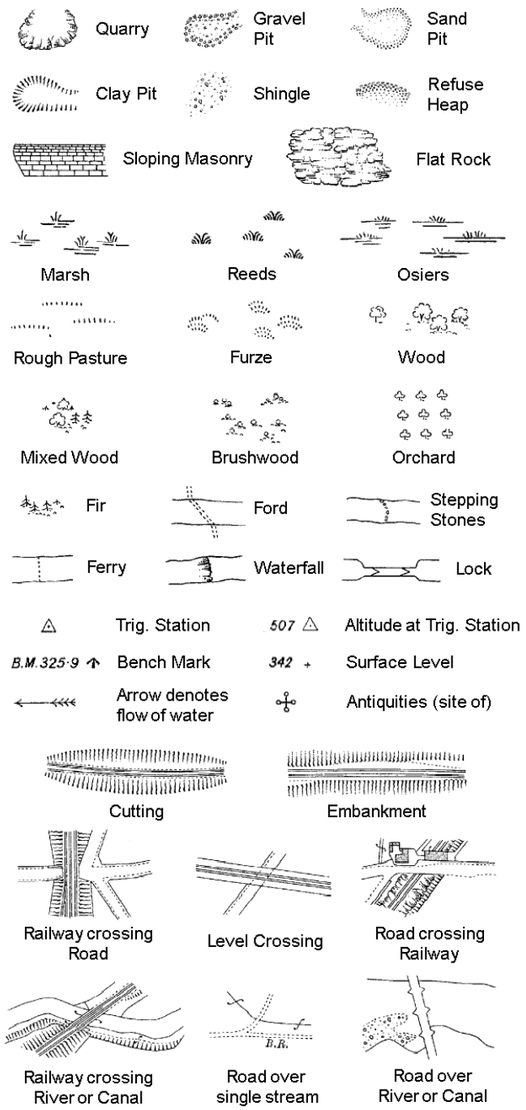
Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

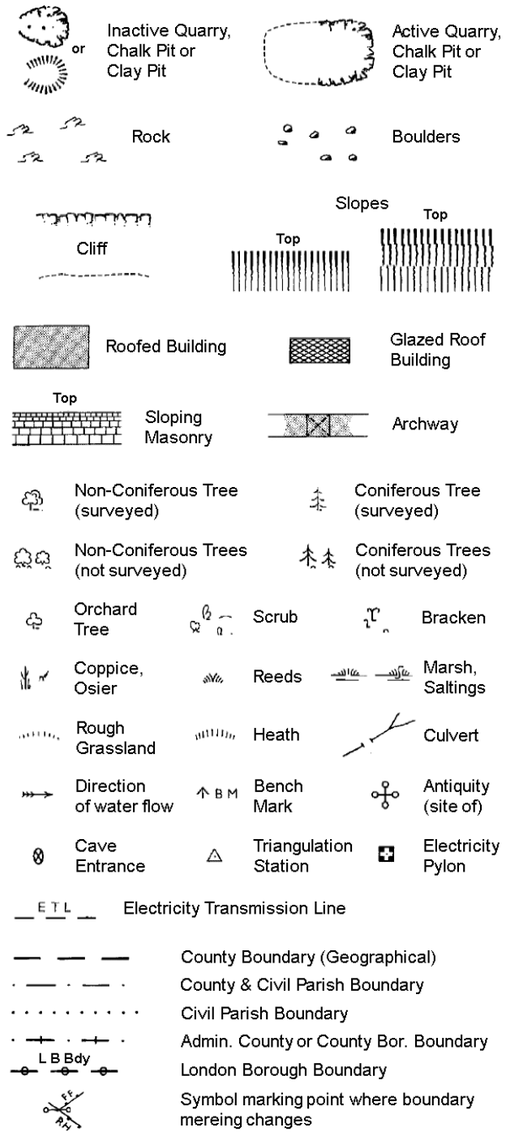
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

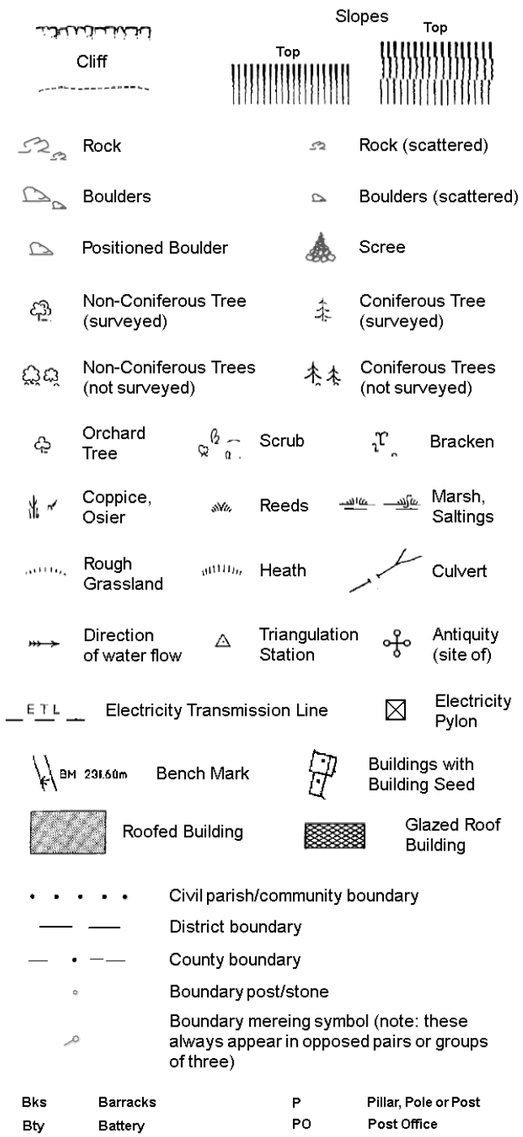
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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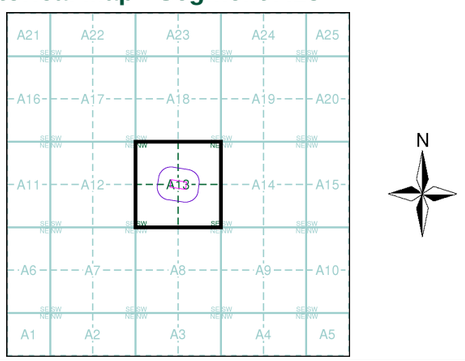
Historical Mapping & Photography included:

Historical Map - Segment A13



Order Details

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Slice: A
Site Area (Ha): 0.75
Search Buffer (m): 100

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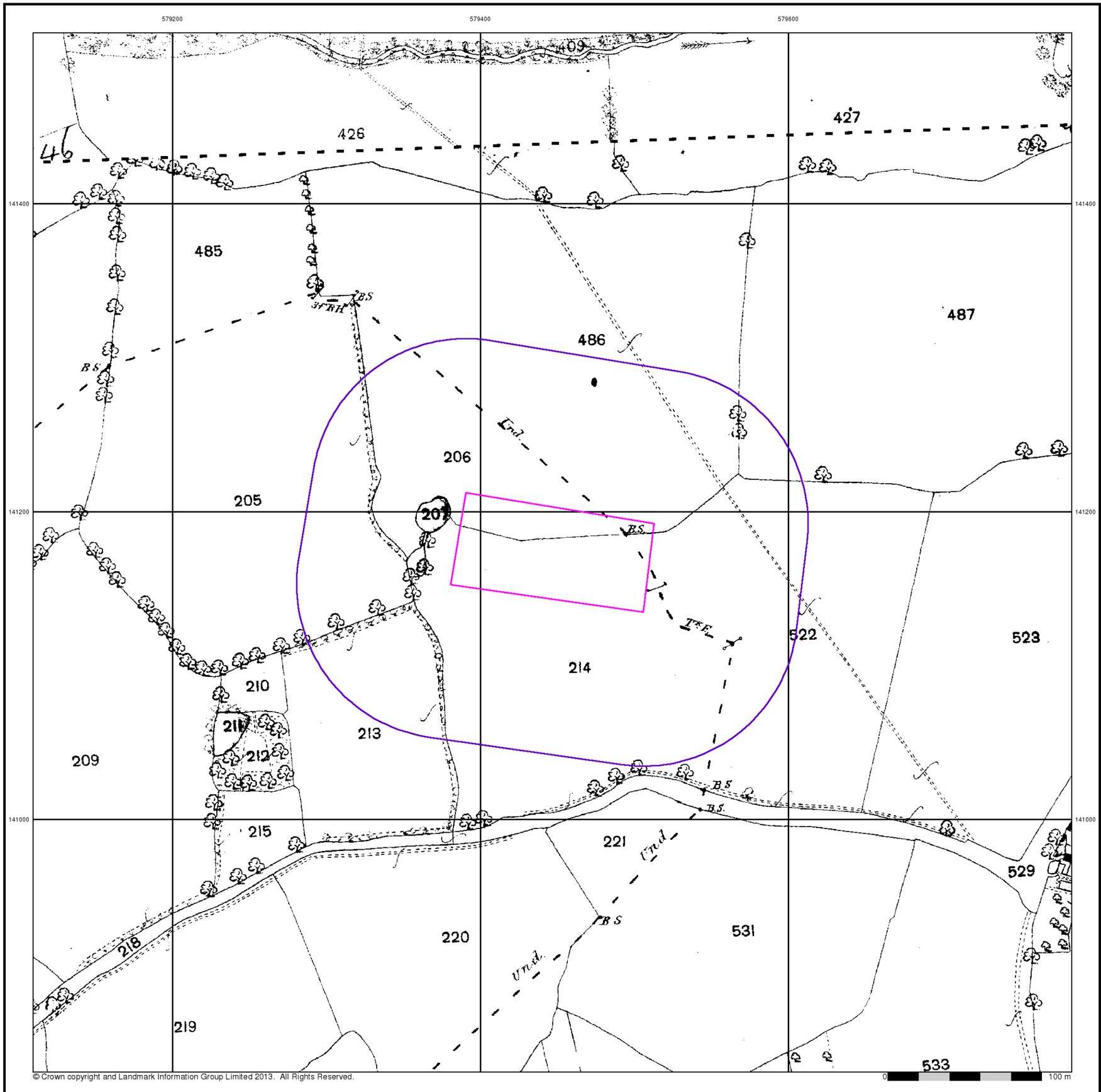

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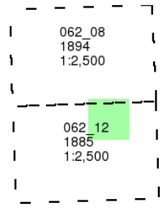
Kent

Published 1885 - 1894

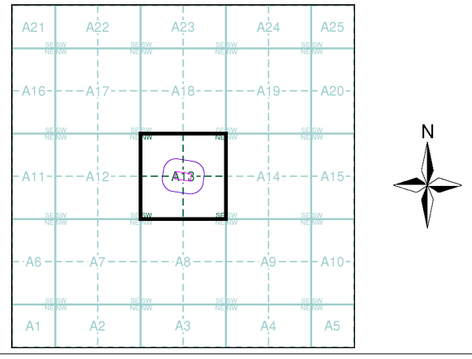
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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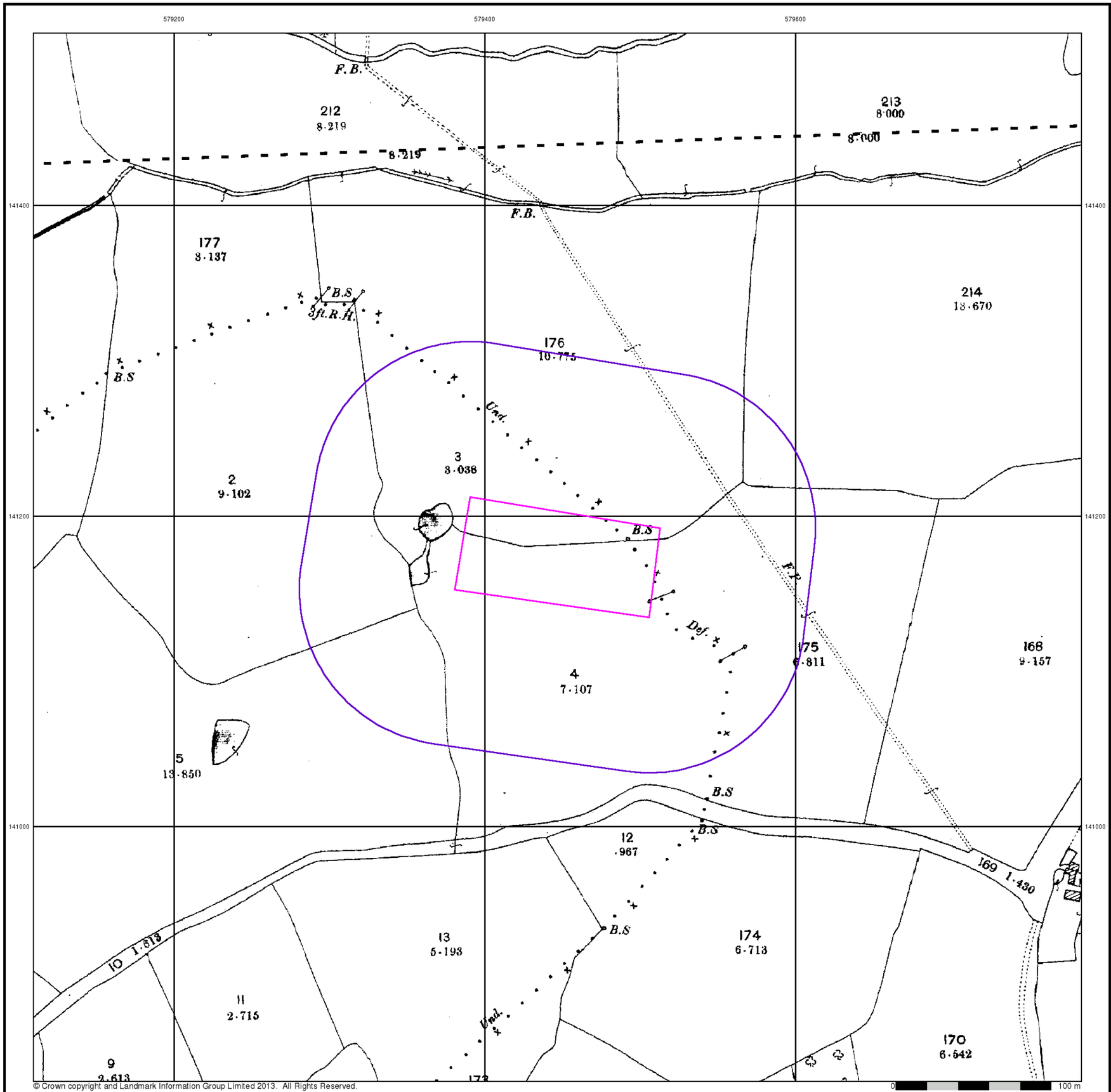
Search Buffer (m):	100

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT



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Kent

Published 1898

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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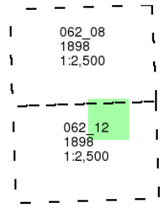
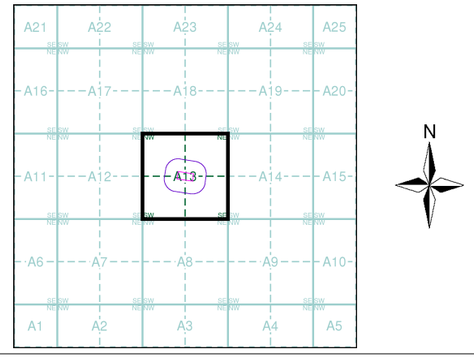


Historical Map - Segment A13



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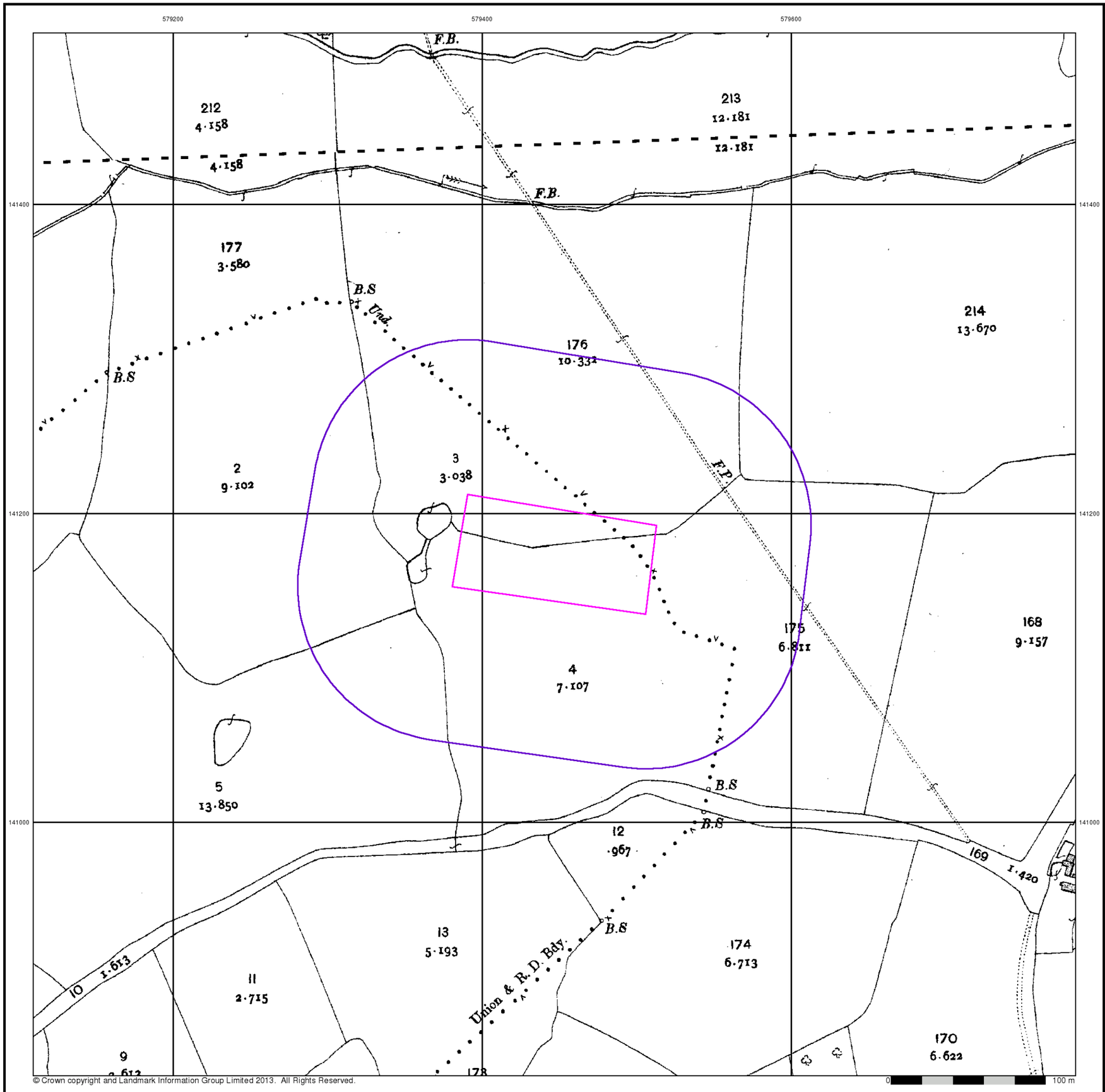

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Kent

Published 1908

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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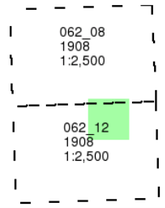
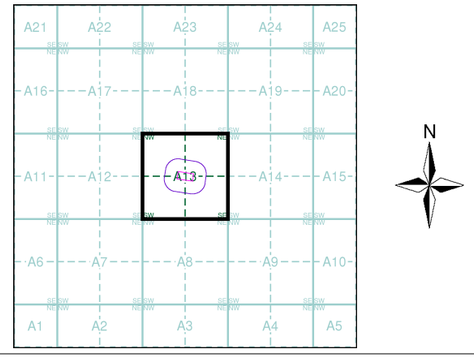


Historical Map - Segment A13



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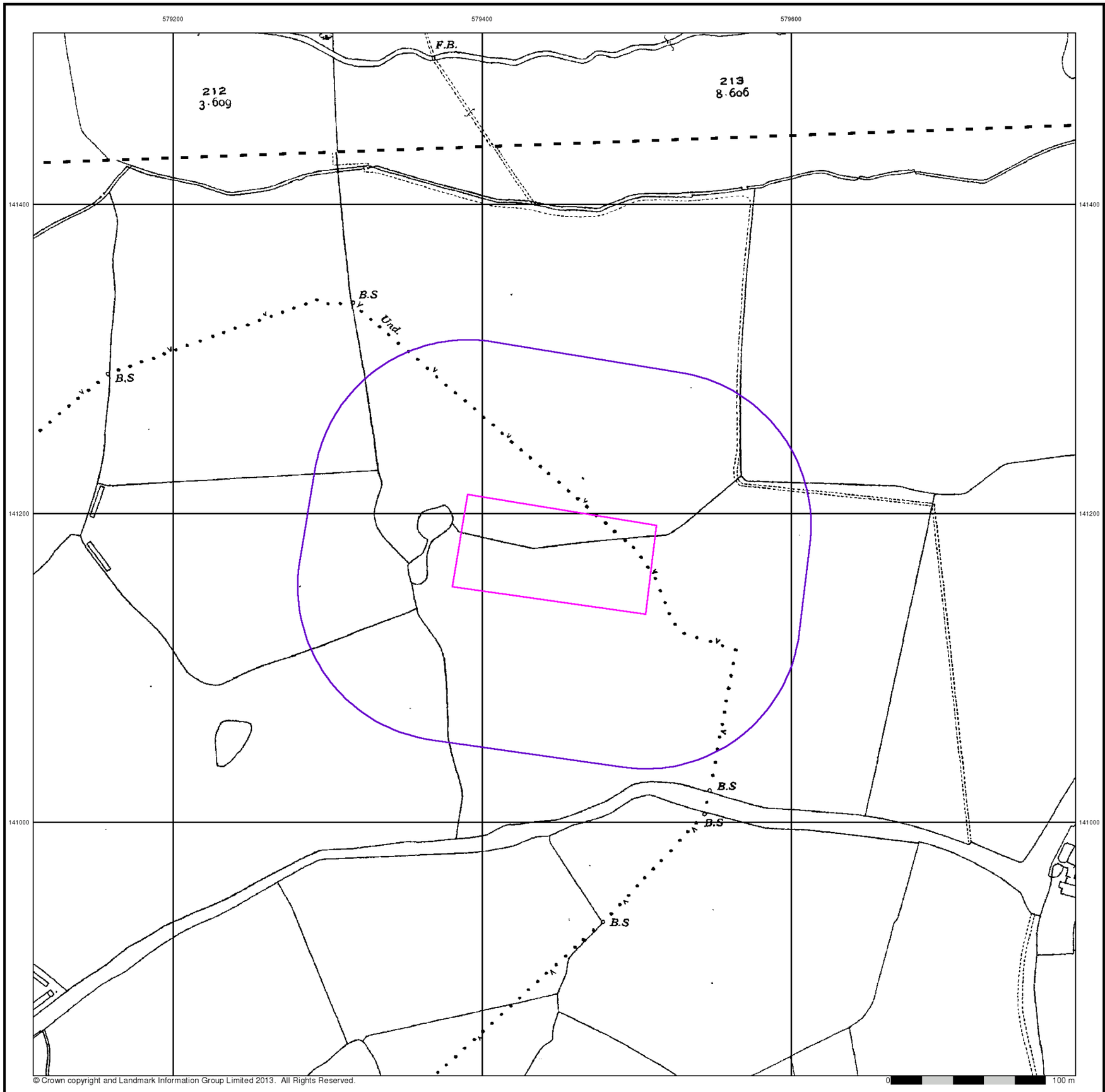

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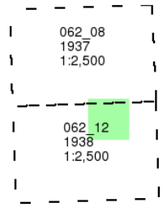
Kent

Published 1937 - 1938

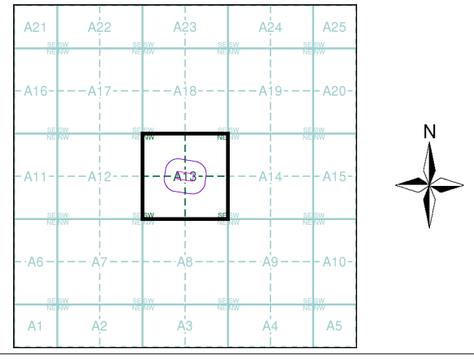
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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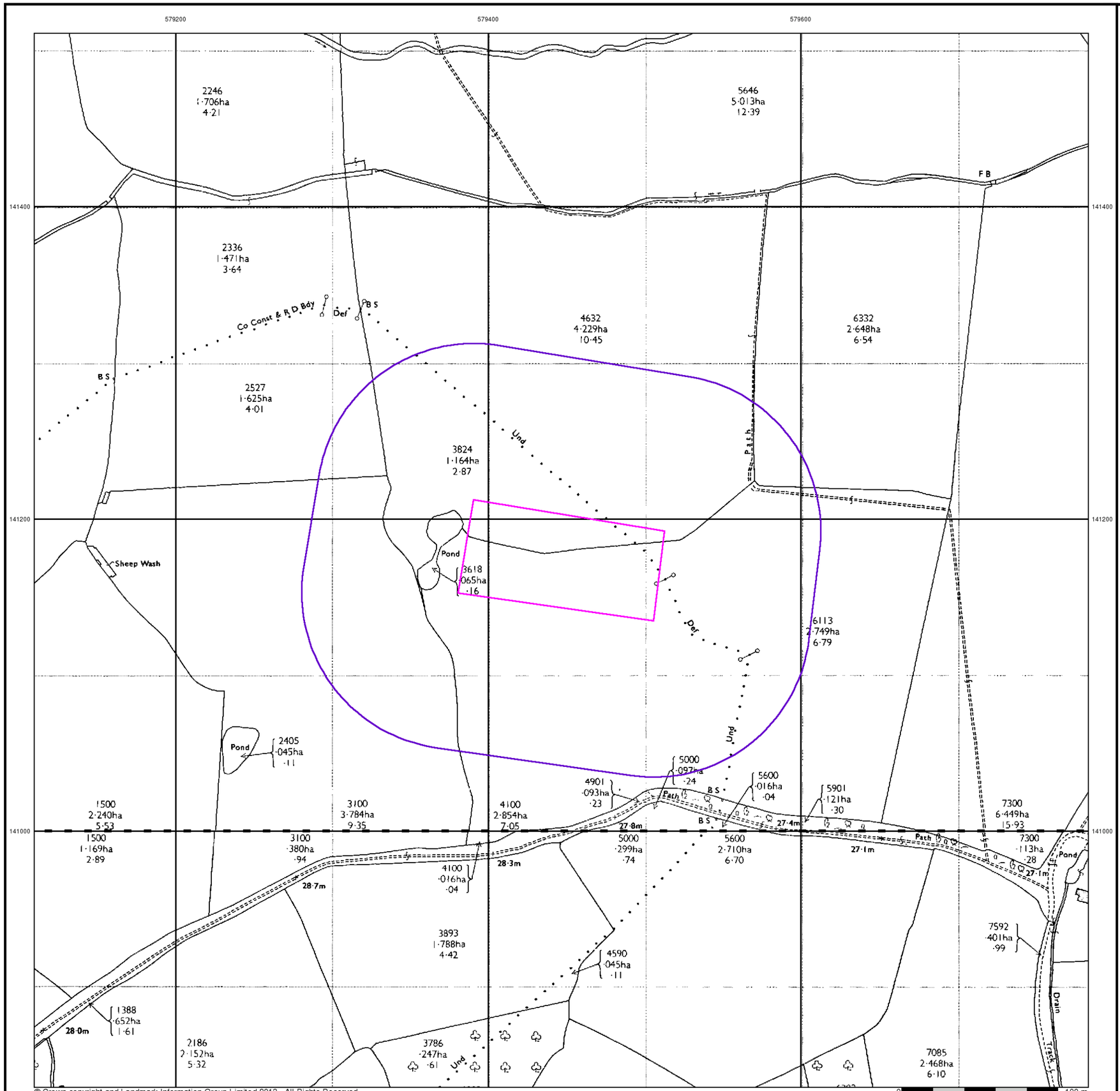

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Ordnance Survey Plan

Published 1970

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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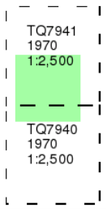
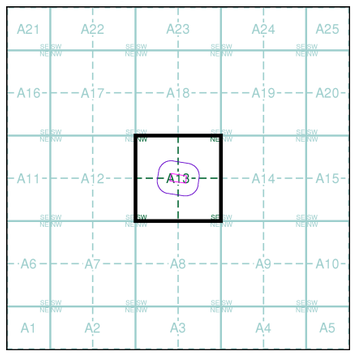


Historical Map - Segment A13



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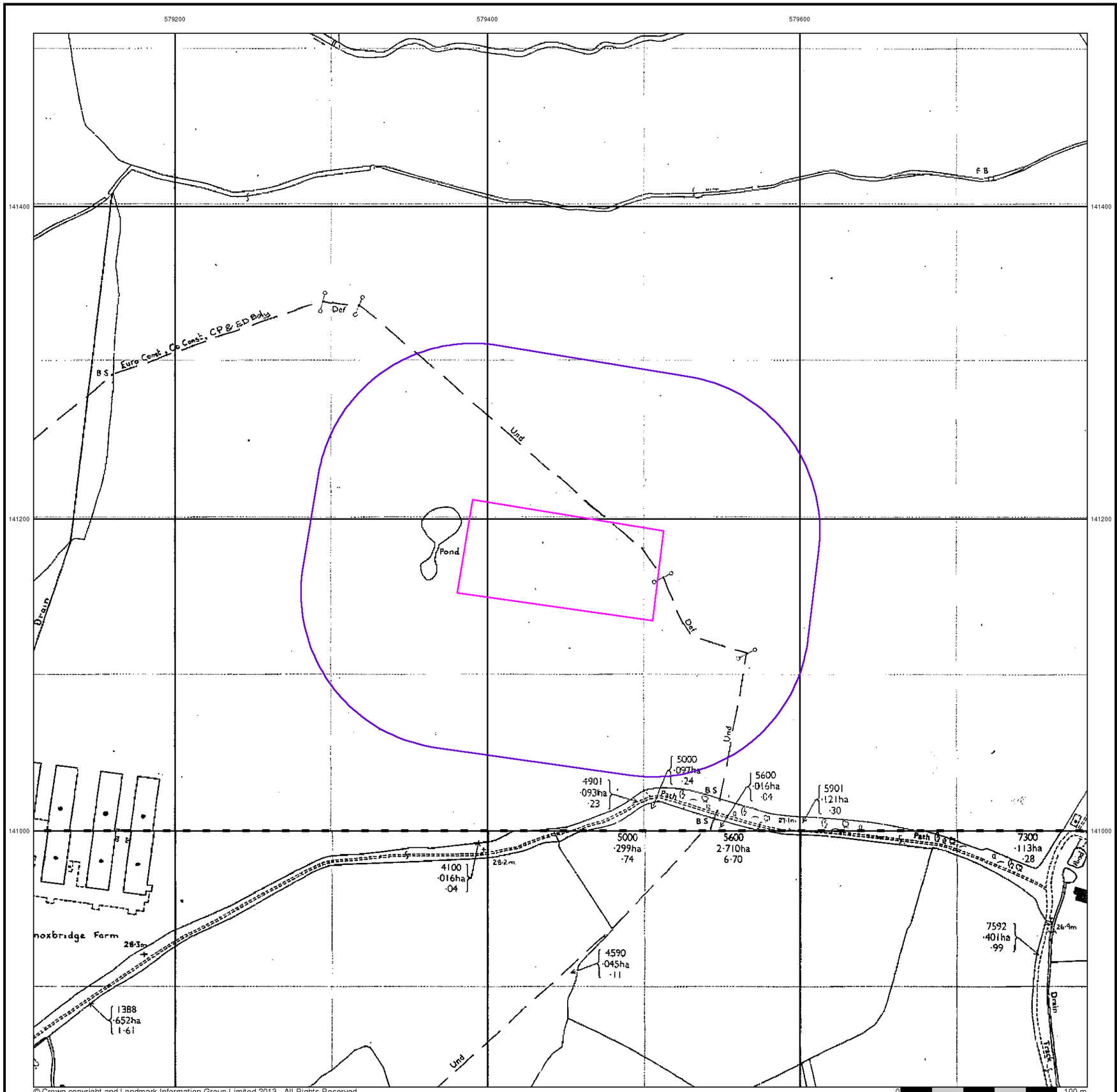

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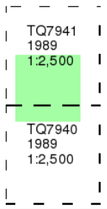
Additional SIMs

Published 1989

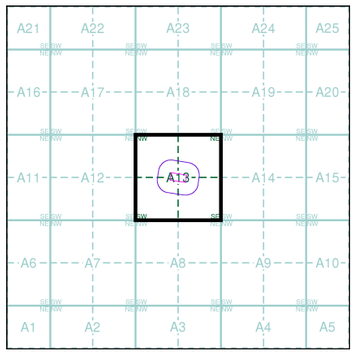
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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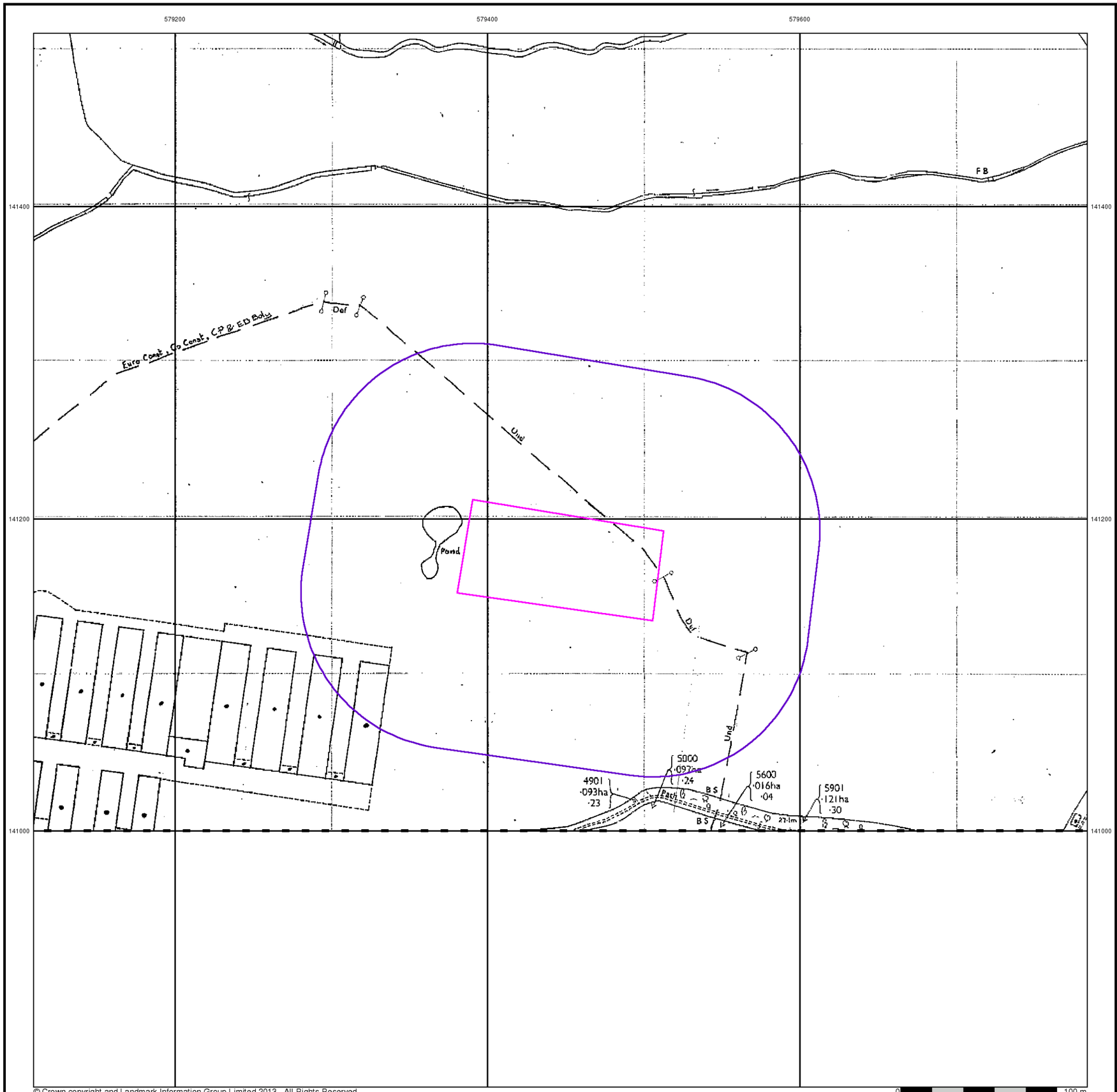

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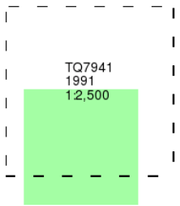
Additional SIMs

Published 1991

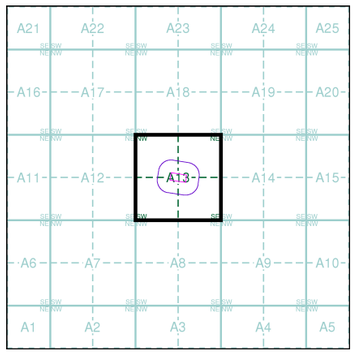
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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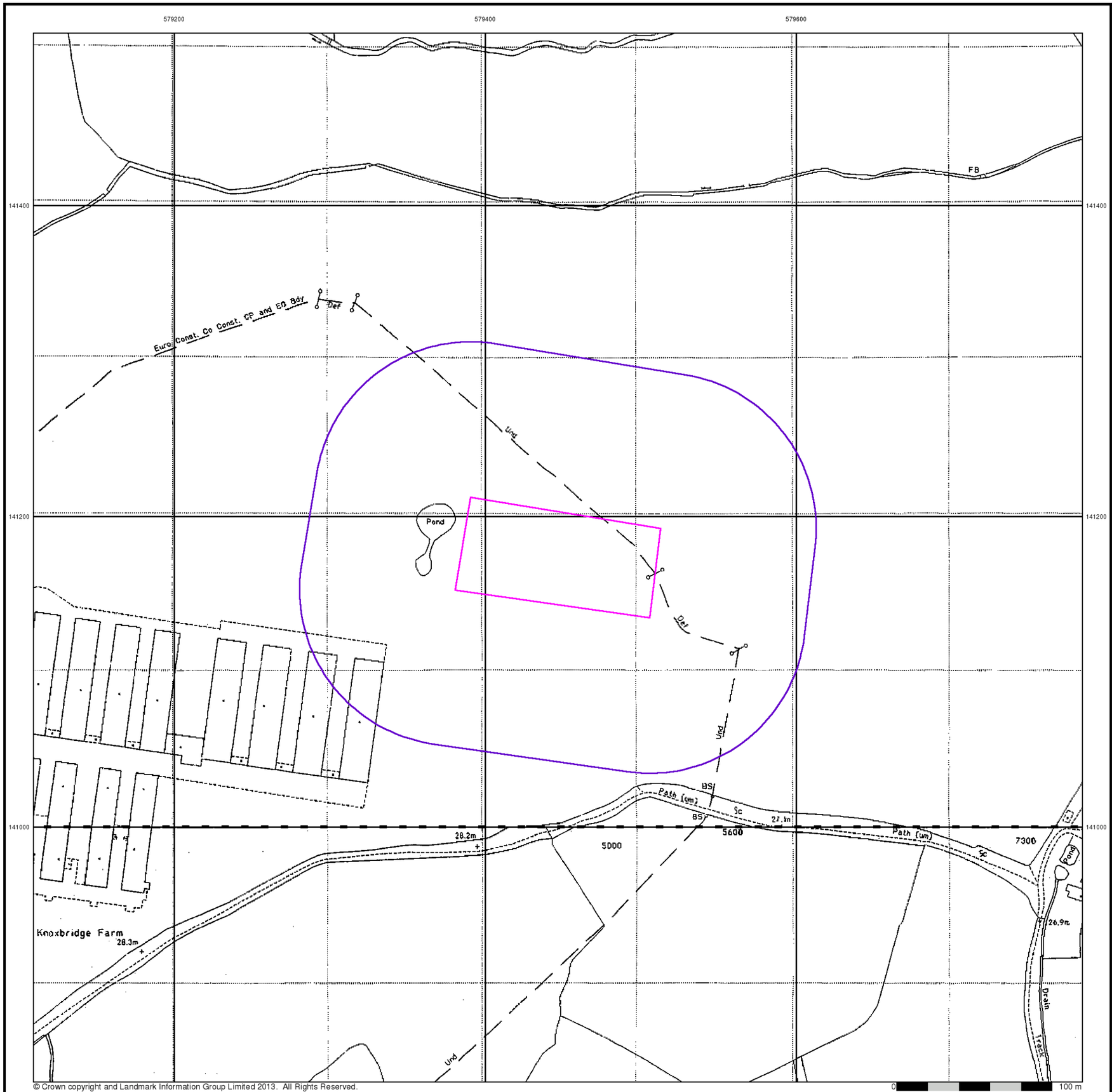

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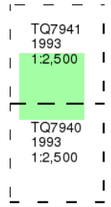
Large-Scale National Grid Data

Published 1993

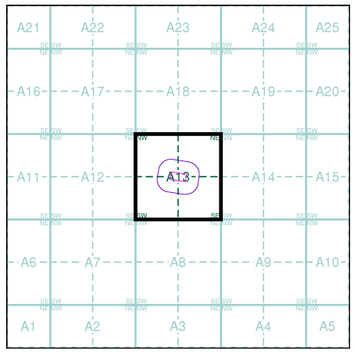
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

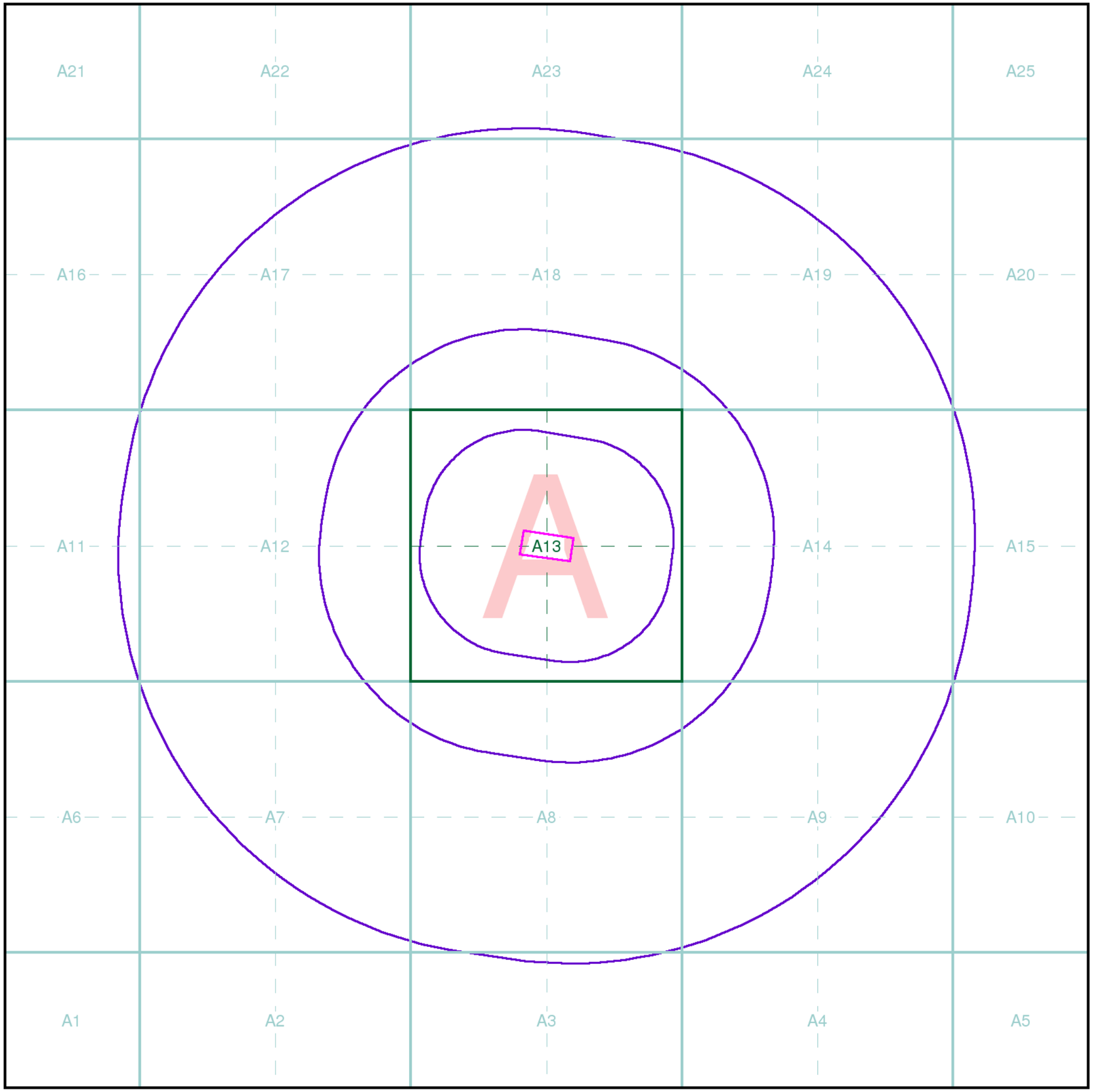
Order Number:	61411958_1_1
Customer Ref:	Knoxbridge Farm ST14236
National Grid Reference:	579450, 141170
Slice:	A
Site Area (Ha):	0.75
Search Buffer (m):	100

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



wardell armstrong

your earth our world

Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Ordnance Survey® Licensed Partner

British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

NATURAL ENGLAND

Envirocheck reports are compiled from 136 different sources of data.

Client Details

S Rahman, Wardell Armstrong LLP, 3rd Floor, 46 Chancery Lane, London, WC2A 1JE

Order Details

Order Number:	61411958_1_1
Customer Ref:	Knoxbridge Farm ST14236
National Grid Reference:	579450, 141170
Site Area (Ha):	0.75
Search Buffer (m):	1000

Site Details

Knoxbridge Farm, Cranbrook Road, Frittenden, CRANBROOK, Kent, TN17 2BT

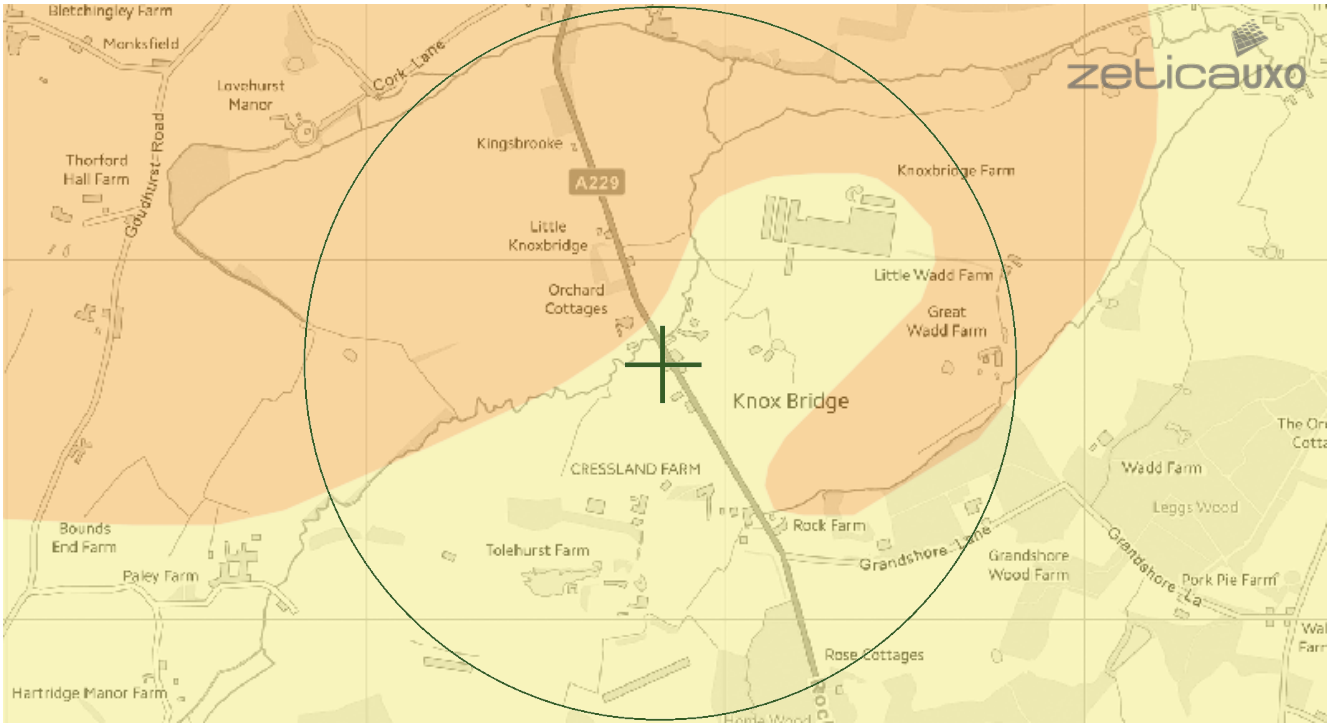
Full Terms and Conditions can be found on the following link:
http://www.landmarkinfo.co.uk/Terms/Show/515

Landmark® Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

UNEXPLODED BOMB RISK MAP

SITE LOCATION

Location: TN17 2BX,
Map Centre: 578832,140714



LEGEND

High: Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.

Moderate: Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.

Low: Areas indicated as having 15 bombs per 1000acre or less.

miltary **industry** **UXO find**

transport **dock** **Luftwaffe targets**

utilities **other**

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: **(https://zeticauxo.com/downloads-and-resources/risk-maps/)**

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

Appendix B – Geotechnical Data Summary Tables

TABLE B-1: GEOTECHNICAL DATA SUMMARY FOR MADE GROUND

Test (Units of Measurement)	No.	Range	Median
Standard Penetration Test N value	6	10 – 17	12.5
Gradings	1		
- Cobble content (%)	1	0	
- Gravel content (%)	1	49	
- Sand content (%)	1	16	
- Silt content (%)	1	15	
- Clay content (%)	1	20	
- Fines (clay + silt) content (%)	1	35	
Moisture Content (%)	21	9.7 – 33	23
Atterberg Limits	1		
- Plastic Limit (%)	1	23	
- Liquid Limit (%)	1	45	
- Plasticity Index (%)	1	22	
- Classification (after A – line)	1	CI	
Moisture Condition Value, MCV at natural moisture content	1	8.2	
Hand vane shear strength (kPa)	7		
- peak	7	51 – 220	124
- residual	7	3 – 36	24

TYPE 1

A single Standard Penetration Test (SPT) was undertaken in the Type 1 material in borehole WS05, yielding an N value of 24 at 1mbgl.

TABLE B-2: GEOTECHNICAL DATA SUMMARY FOR BUND STOCKPILE MATERIALS

Test (Units of Measurement)	No.	Range	Median
Gradings	3		
- Cobble content (%)	3	0	
- Gravel content (%)	3	0, 1 & 2	
- Sand content (%)	3	9, 15 & 17	
- Silt content (%)	3	44, 45 & 47	
- Clay content (%)	3	38, 39 & 43	
- Fines (clay + silt) content (%)	3	83, 83 & 90	
Moisture Content (%)	14	23 – 32	26
Atterberg Limits	4		
- Plastic Limit (%)	4	23 – 27	26
- Liquid Limit (%)	4	48 – 65	58.5
- Plasticity Index (%)	4	25 – 38	32.5
- Classification (after A – line)	4	3 x CH, 1 x CI	CH
California Bearing Ratio, CBR, laboratory	2	1.8 & 4.0	
“Compaction” tests, 2.5kg	2		
- Maximum Dry Density (Mg/m^3)	2	1.60 & 1.64	
- Optimum Moisture Content (%)	2	22 & 23	
Moisture Condition Value, MCV at natural moisture content	3	7.1, 8.8 & 9.4	
Hand vane shear strength (kPa)	3		
- peak	3	51, 58 & 79	
- residual	3	3, 4 & 5	

TABLE B-3: GEOTECHNICAL DATA SUMMARY FOR THE WEALD CLAY

Test (Units of Measurement)	No.	Range	Median
Standard Penetration Test N value	47		
- All tests	47	7 – 50	32
- Complete tests	42	7 – 50	28.5
- Incomplete penetration	5	50	
Gradings	5		
- Cobble content (%)	5	0	0
- Gravel content (%)	5	0 – 1	0.4
- Sand content (%)	5	0 – 2	0.4
- Silt content (%)	5	40 – 46	45
- Clay content (%)	5	51 – 60	55
- Fines (clay + silt) content (%)	5	97 – 100	100
Moisture Content (%)	49	1.9 – 36	24
Atterberg Limits	18		
- Plastic Limit (%)	18	11 – 31	24.5
- Liquid Limit (%)	18	38 – 79	56.5
- Plasticity Index (%)	18	20 – 48	33.5
- Classification (after A – line)	18	12 x CH, 4 x CI, 2 x CV	CH
Bulk Density (Mg/m^3)	8	1.88 – 2.16	2.115
Dry Density (Mg/m^3)	8	1.43 – 1.88	1.75
California Bearing Ratio, CBR, laboratory	4 *	8.3 – 13.7	10.9
* two tests, top and base CBR not within ±10% of mean, so all four values used.			
"Compaction" tests, 2.5kg	1		
- Maximum Dry Density (Mg/m^3)	1	1.71	
- Optimum Moisture Content (%)	1	19	
Moisture Condition Value, MCV	6		
- MCV at natural moisture content	5	9.5 – 13.1	11.2
- calibration test, Sensitivity (MCV/mc%)	1	0.95 (low)	
Total stress triaxial tests, undrained shear strength, c_u (kPa)	5	67 – 128	119
Hand vane shear strength (kPa)	38	(3 "too friable")	
- peak	35	89 – 236	160
- residual	35	7 – 56	28
"Oedometer" consolidation tests #	3		
- coefficient of volume compressibility, m_v (m^2/MN) #	3	c.0.045, 0.09 & 0.135	
- coefficient of consolidation, c_v (t_{90}) (m^2/year) #	3	c.1, 1.7 & 11.7	
# estimated at a stress increment of 100kPa in excess of the existing vertical effective stress			

TABLE B-4: GEOTECHNICAL DATA SUMMARY FOR WEATHERED MUDSTONE / GRAVEL OF THE WEALD CLAY

Test (Units of Measurement)	No.	Range	Median
Standard Penetration Test N value	3		
- All tests	3	43, 43 & 50	
- Complete tests	2	43	
- Incomplete penetration	1	50	
Gradings	2		
- Cobble content (%)	2	0 & 17	
- Gravel content (%)	2	1 & 53	
- Sand content (%)	2	0 & 3	
- Silt content (%)	2	14 & 53	
- Clay content (%)	2	16 & 43	
- Fines (clay + silt) content (%)	2	30 & 96	
Moisture Content (%)	12	14 – 28	19.5
Atterberg Limits	2		
- Plastic Limit (%)	2	22 & 29	
- Liquid Limit (%)	2	37 & 71	
- Plasticity Index (%)	2	15 & 42	
- Classification (after A – line)	2	1 x CI, 1 x CV	
Bulk Density (Mg/m^3)	1	2.19	
Dry Density (Mg/m^3)	1	1.92	
“Compaction” tests, 2.5kg	1		
- Maximum Dry Density (Mg/m^3)	1	1.64	
- Optimum Moisture Content (%)	1	22	
“Oedometer” consolidation tests #	1		
- coefficient of volume compressibility, m_v (m^2/MN) #	1	c.0.07	
- coefficient of consolidation, c_v (t_{90}) (m^2/year) #	1	c.2.5	
# estimated at a stress increment of 100kPa in excess of the existing vertical effective stress			

TABLE B-5: GEOTECHNICAL DATA SUMMARY – CHEMICAL TEST DATA

Test	Units	MADE GROUND		BUND STOCKPILE		WEALD CLAY	
		No.	Range	No.	Range	No.	Range
pH value	-	5	7.7 – 8.3	2	7.8 & 8.4	4	7.8 – 10.2
Sulphate aqueous extract as SO_4	mg/l	5	23 – 160	2	19 & 94	4	22 - 730
Sulphate as SO_4, Total	%	1	0.03	2	0.08 & 0.10	2	0.02 & 0.04
Sulphur as S, Total	%	1	0.01	2	0.04 & 0.08	2	0.02 & 0.05
Chloride aqueous extract	mg/l	1	9.2	2	5.4 & 10	2	6.0 & 44
Nitrate aqueous extract as NO_3	mg/l	1	21	2	13 & 27	2	3.3 & 24
Magnesium aqueous extract	mg/l	3	4.7 – 10.9	2	< 10	3	< 10 – 160
Total Sulphate as SO_4	mg/kg	4	566 – 1142			2	1295 & 2265
Total Sulphur as S	mg/kg	2	367 & 546			1	762
Elemental Sulphur as S	mg/kg	3	< 10			1	< 10
Sulphide	mg/kg	3	< 5			1 < 5	
Water soluble Chloride	mg/kg	2	14 & 123			1	120
Water soluble Nitrate as NO_3	mg/kg	2	5 & 10			1	22
Ammonium as NH_4	mg/kg	2	0.5 & 52.4			1	8.4

Appendix C – Factual Ground Investigation Report, Chelmer Site Investigations, 2014

Chelmer Site Investigations

Unit 15, East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 **Fax:** 01245 400 933
Email: info@siteinvestigations.co.uk **Website**: www.siteinvestigations.co.uk

Factual Report

Client:	Wardell Armstrong
Site:	Knoxbridge Farm, Kent, TN17 2BT
CSI Ref:	FACT/4921
Dated:	31st October 2014

Chelmer Site Investigations

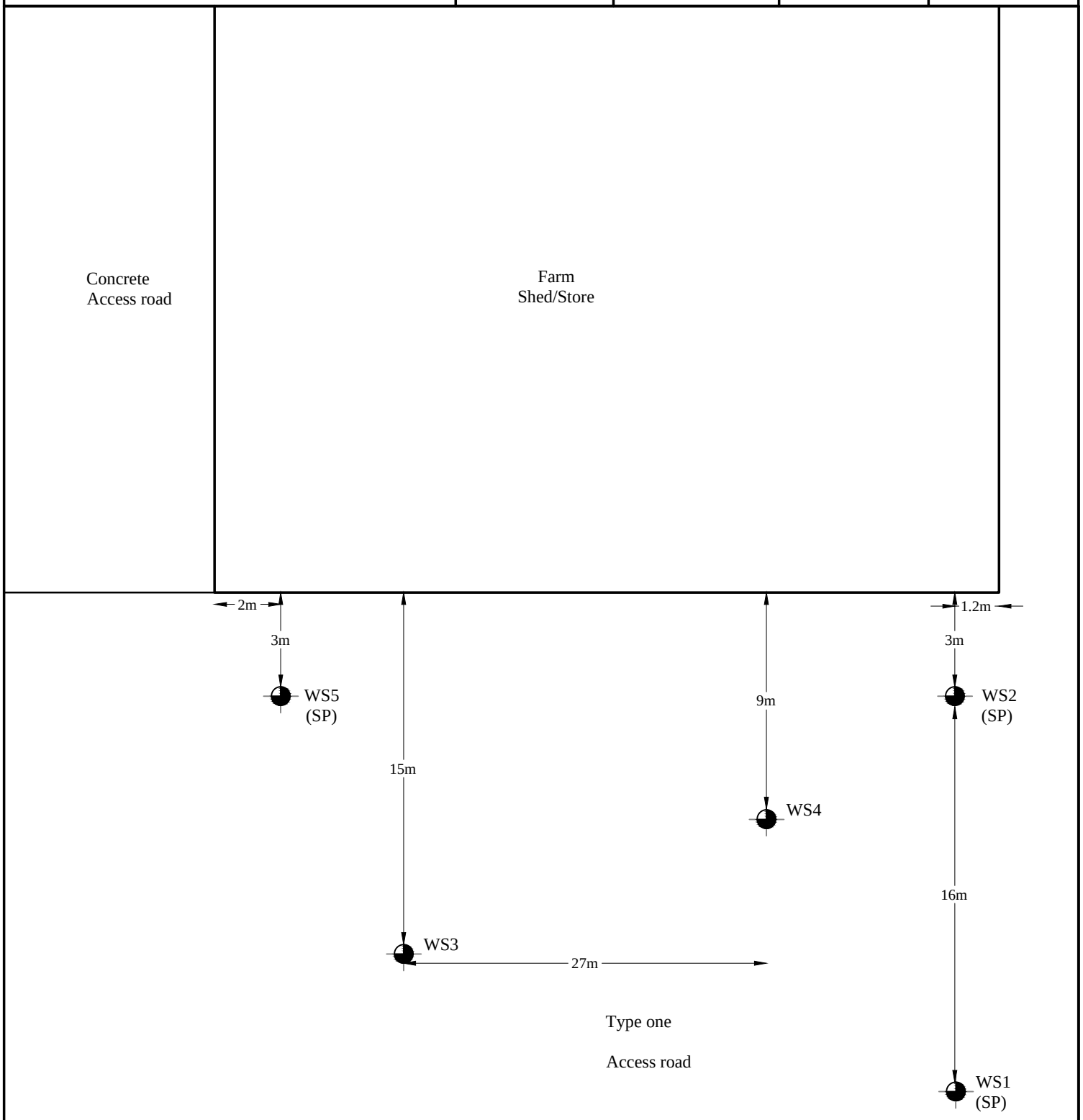
Unit 15, East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 **Fax:** 01245 400 933
Email: info@siteinvestigations.co.uk **Website**: www.siteinvestigations.co.uk

FACTUAL REPORT CONTENT

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations

Client: Wardell Armstrong	**Scale:** N.T.S.	**Sheet:** 1 of 1	**Date:** 31.10.14
Location: Knoxbridge Farm, Kent, TN17 2BT	**Job No:** 4921	**Weather:** Fine	**Drawn by: MM** / **Checked by: JH**



Notes: *On site tree identification for guidance only. Not authenticated.*

Key:

Tree/Shrub | Borehole | Trial Pit | Gully | Tree Stump | Rain Water/ Soil Pipe | Manhole

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wardell Armstrong	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Fine	**Date:** 31.10.14
Site: Knoxbridge Farm, Kent, TN17 2BT	**Job No:** 4921	**WS No:** 1	**Boring method:** Archway	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	TYPE ONE	0.15							G.L.
0.15	MADE GROUND: firm, dark brown, silty sand with brick and concrete fragments.	0.25					No roots observed.		
0.4	Firm, light brown, grey veined, silty CLAY with partings of brown and grey silt and fine sand.			U					
					SPT	N = 13			1.0
				U					
									2.0
				U					
	Becoming stiff from 2.7m.	4.6							
								3.1	3.0
				U					
					SPT	N = 22			4.0
								4.35	
				U					
5.0	WS ends at 5.0 m								5.0

Drawn by: MM **Approved by:** JH

Remarks: *Groundwater seepage at 3.1m.*
Groundwater standing at 4.35m on completion.
Metal standpipe installed to 5.3m on completion.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wardell Armstrong	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Fine	**Date:** 31.10.14
Site: Knoxbridge Farm, Kent, TN17 2BT	**Job No:** 4921	**WS No:** 2	**Boring method:** Archway	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	CONCRETE	0.05							G.L.
0.05	TYPE ONE	0.1					No roots observed.		
0.15	MADE GROUND: firm, dark brown, silty sandy gravelly clay with occasional brick and concrete fragments.	0.15							
0.3	Firm, light brown, grey veined, silty CLAY with partings of brown and grey silt and fine sand.			U					
1.0				U	SPT	N = 10			1.0
2.0				U	SPT	N = 07			2.0
	Becoming very stiff from 2.6m.	4.7		U					
3.0				U	SPT	N = 32		*3.2*	3.0
4.0				U				*3.8*	4.0
5.0	WS ends at 5.0 m								5.0

Drawn by: MM **Approved by:** JH

Remarks: *Groundwater seepage at 3.2m.*
Groundwater standing at 3.8m on completion.
Plastic standpipe installed to 3.9m on completion.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations

Client: Wardell Armstrong	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Fine	**Date:** 31.10.14
Site: Knoxbridge Farm, Kent, TN17 2BT	**Job No:** 4921	**WS No:** 3	**Boring method:** Archway	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	TYPE ONE/MADE GROUND: medium compact, mid brown, gravelly silty clay with numerous brick fragments.	0.8		U			No roots observed.		G.L.
0.8	MADE GROUND: medium compact, mid brown/olive, gravelly silty clay with numerous brick fragments.	1.2		U				*0.8*	1.0
2.0	WS abandoned at 2.0 m Due to obstruction thought to be a made ground, possibly a pipe.							*1.2*	2.0

Drawn by: MM **Approved by:** JH

Remarks: *Groundwater seepage at 0.8m.*
Groundwater standing at 1.2m on completion.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations

Client: Wardell Armstrong	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Fine	**Date:** 31.10.14
Site: Knoxbridge Farm, Kent, TN17 2BT	**Job No:** 4921	**WS No:** 4	**Boring method:** Archway	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	TYPE ONE/MADE GROUND: medium compact, mid brown, gravelly silty clay with numerous brick fragments.	0.7		U			No roots observed.		G.L.
0.7	Firm, light brown, grey veined, silty CLAY with partings of brown and grey silt and fine sand.	2.3		U	SPT	N = 10			1.0
	Becoming stiff from 2.3m.			U					2.0
	Becoming very stiff from 2.7m.			U				*2.5*	
								2.8	
3.0	WS ends at 3.0 m				SPT	N = 34			3.0

Drawn by: MM **Approved by:** JH

Remarks: *Groundwater seepage at 2.5m.*
Groundwater standing at 2.8m on completion.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wardell Armstrong	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Fine	**Date:** 31.10.14
Site: Knoxbridge Farm, Kent, TN17 2BT	**Job No:** 4921	**WS No:** 5	**Boring method:** Archway	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	TYPE ONE	1.6		U			No roots observed.	*0.9*	G.L.
	NB Obstruction at 1.2m.			U	SPT	N = 24		*1.0*	1.0
1.6	Stiff, light brown, grey veined, silty CLAY with partings of brown and grey silt and fine sand.	3.4		U	SPT	N = 21			2.0
	Becoming very stiff from 3.0m.			U	SPT	N = 28			3.0
				U					4.0
5.0	WS ends at 5.0 m			U	SPT	N = 40			5.0

Drawn by: MM **Approved by:** JH

Remarks: *Groundwater strike at 1.0m.*
Groundwater standing at 0.9m on completion.
Metal standpipe installed to 5.3m on completion.
WS open on completion.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Consultancy Services
Unit 15, East Hanningfield Industrial Estate, Old Church Road
East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 Fax: 01245 400 933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Groundwater Monitoring Assessment

Site Ref: 4921
Site Name: Knoxbridge Farm, Kent, TN17 2BT

Well	Date	Methane Peak	Methane Steady	Methane GSV	Carbon Dioxide Peak	Carbon Dioxide Steady	Carbon Dioxide GSV	Oxygen	Atmos.	Flow	Response Zone	Depth to Water	CO	H2S
		%v/v	%v/v	l/hr	%v/v	%v/v	l/hr	%v/v	mbar	l/hr	m bgl	m bgl	ppm	ppm
WS1	31.10.14											4.35		
WS2	31.10.14											3.80		
WS5	31.10.14											0.90		

Notes

NR = Not recorded
Values in Bold exceed the CO_2 Building Regulations threshold (>1.5%)
Values in Red exceed the Buildings Regulations Action Level (CO_2 >5.0% and CH_4 >1.5%)

Chelmer Geotechnical Laboratories

Unit 15, East Hanningfield Industrial Estate

Old Church Road, East Hanningfield, Essex CM3 8AB

Telephone: 01245 400 930 **Fax:** 01245 400 933

Email: info@siteinvestigations.co.uk **Website**: www.soillabs.co.uk

Geotechnical Testing

Client : Wardell Armstrong

Site Name : Knoxbridge Farm, Kent, TN17 2BT

Client Reference : CSI4921

CGL Reference : CGL04480

Date of Completion : 10-Nov-14

UKAS TESTING
8284

Chelmer Geotechnical Laboratories

Content Summary

This report contains all test results indicated on the attached test instruction/summary (Q17).

CGL Reference :	CGL04480	
Client Reference :	CSI4921	
For the attention of :	Wardell Armstrong	
This report comprises of the following :	4	Page(s) of Results
	1	Moisture/Shear Strength Chart
	1	Plasticity Chart
	8	Page(s) of BRE & SD1 Contamination Testing

Notes :

General

Please refer to report summary notes for details pertaining to methods undertaken and their subsequent accreditations

Samples were supplied by Chelmer Site Investigations

Deviant Samples

Samples were received in suitable containers	Yes
A date and time of sampling was provided	Yes
Arrived damaged and/or denatured	No

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories

Job Number : CGL04480
Client : Wardell Armstrong
Client Reference : CSI4921
Site Name : Knoxbridge Farm, Kent, TN17 2BT

Date Received : 05/11/2014
Date Testing Started : 06/11/2014
Date Testing Completed : 10/11/2014
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
BH1	0.5	58349	D	17	<5	38	11	27	0.20	27	CI								

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
[9] Values of shear strength were determined in situ by Chelmer Site Investigations using a Pilcon hand vane or Geonor vane (GV).
[10] BS 1377 : Part 3 : 1990, Test No 4
[11] BS 1377 : Part 2 : 1990, Test No 9
[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

D - Disturbed sample
B - Bulk sample
U - U100 (undisturbed sample)
W - Water sample
ENP - Essentially Non-Plastic
U/S - Underside Foundation

UKAS TESTING 8284

Comments :-

Technician :- HS
Checked By :- MC
Date Checked :- 10-Nov-14

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories

Job Number : CGL04480
Client : Wardell Armstrong
Client Reference : CSI4921
Site Name : Knoxbridge Farm, Kent, TN17 2BT

Date Received : 05/11/2014
Date Testing Started : 06/11/2014
Date Testing Completed : 10/11/2014
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
BH2	1.0	58352	D	15	51	41	14	27	0.04	14	CI								

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
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[12] BS 1377 : Part 3 : 1990, Test No 5.6
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D - Disturbed sample
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U/S - Underside Foundation

UKAS TESTING 8284

Comments :-

Technician :- HS
Checked By :- MC
Date Checked :- 10-Nov-14

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories

Job Number : CGL04480
Client : Wardell Armstrong
Client Reference : CSI4921
Site Name : Knoxbridge Farm, Kent, TN17 2BT

Date Received : 05/11/2014
Date Testing Started : 06/11/2014
Date Testing Completed : 10/11/2014
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
BH4	1.5	58359	D	23	<5	53	17	36	0.17	36	CH								

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
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[10] BS 1377 : Part 3 : 1990, Test No 4
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[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
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Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key
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ENP - Essentially Non-Plastic
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UKAS TESTING
8284

Comments :-

Technician :- HS
Checked By :- MC
Date Checked :- 10-Nov-14

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories

Job Number : CGL04480
Client : Wardell Armstrong
Client Reference : CSI4921
Site Name : Knoxbridge Farm, Kent, TN17 2BT

Date Received : 05/11/2014
Date Testing Started : 06/11/2014
Date Testing Completed : 10/11/2014
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
BH5	4.0	58362	D	25	52	59	17	42	0.19	20	CH								

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
[9] Values of shear strength were determined in situ by Chelmer Site Investigations using a Pilcon hand vane or Geonor vane (GV).
[10] BS 1377 : Part 3 : 1990, Test No 4
[11] BS 1377 : Part 2 : 1990, Test No 9
[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

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U - U100 (undisturbed sample)
W - Water sample
ENP - Essentially Non-Plastic
U/S - Underside Foundation

UKAS TESTING 8284

Comments :-

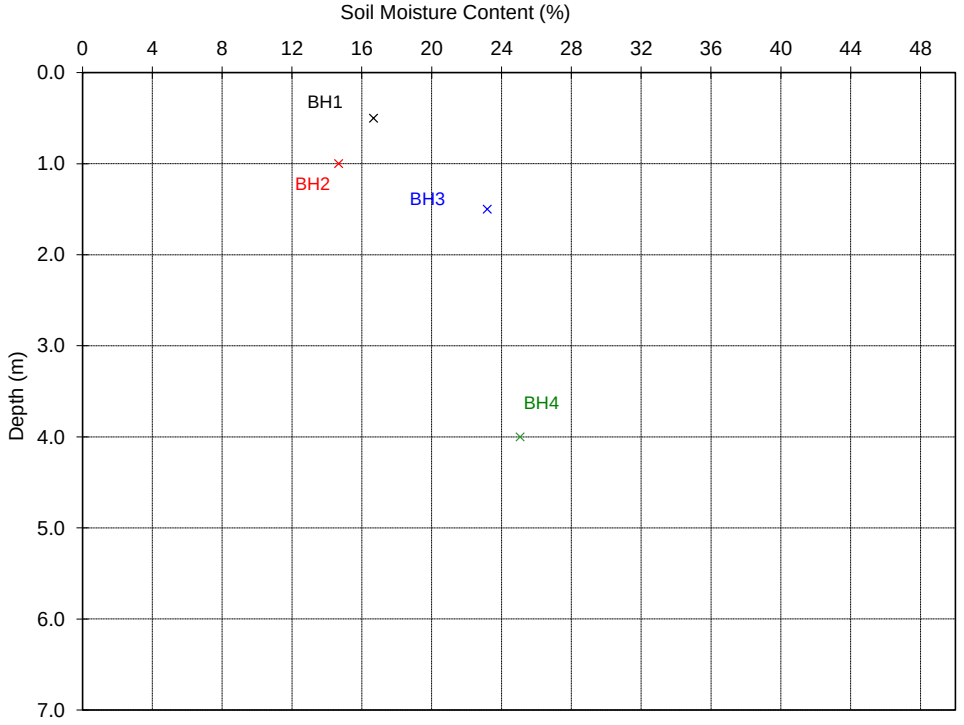
Technician :- HS
Checked By :- MC
Date Checked :- 10-Nov-14

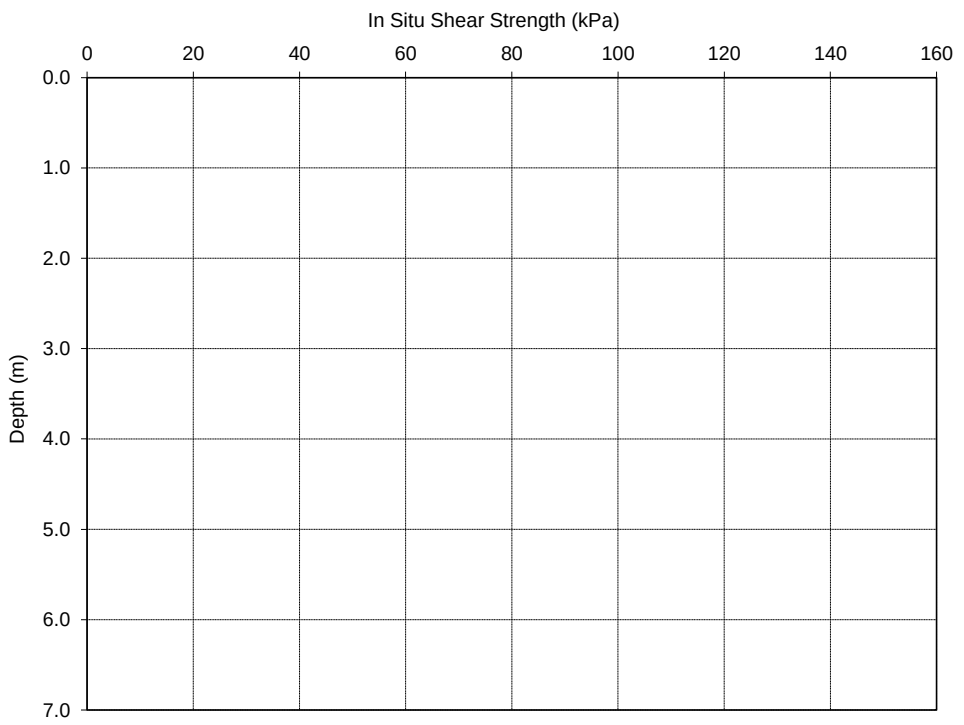
Laboratory Testing Results

Moisture Content/Shear Strength Profile

Chelmer Geotechnical Laboratories

Job Number :	CGL04480	Date Received :	05/11/2014
Client :	Wardell Armstrong	Date Testing Started :	06/11/2014
Client Reference :	CSI4921	Date Testing Completed :	10/11/2014
Site Name :	Knoxbridge Farm, Kent, TN17 2BT	Laboratory :	Chelmer Geotechnical Laboratories, CM3 8AB





Notes :-

1. If the Soil Fraction > 0.425mm exceeds 5% the Equivalent Moisture Content of the remainder (calculated in accordance with BS 1377: Part 2 : 1990, cl.3.2.4 note 1) is also plotted and the alternative profile additionally shown as an appropriately coloured broken line.
2. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly over consolidated clays) at shallow depths.

Unless otherwise stated, values of Shear Strength were determined in situ by Chelmer Site Investigations using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 140 kPa.

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8284

Comments :-

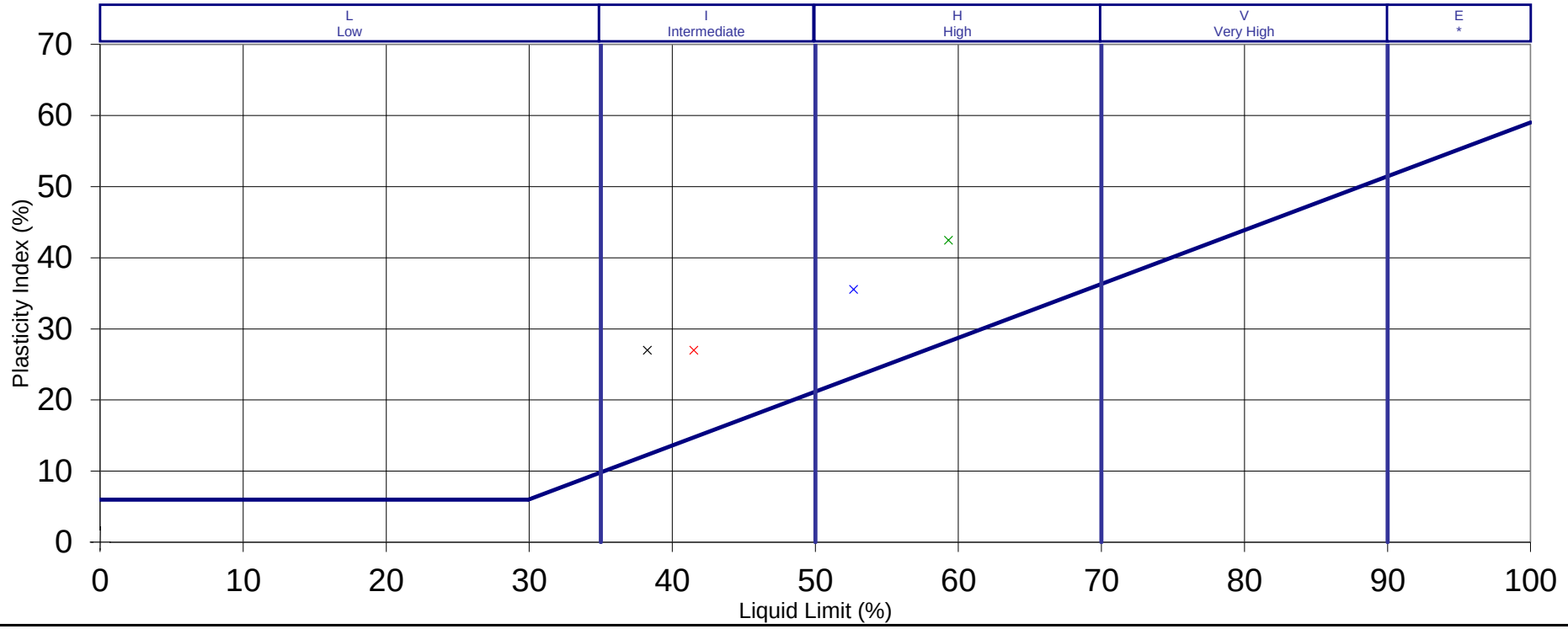
Checked By :- MC Date Checked :- 10-Nov-14

Laboratory Testing Results

Plasticity Chart for the classification of fine soils and the finer part of coarse soils
In Compliance with BS5930 : 1999

Chelmer Geotechnical Laboratories

Job Number :	CGL04480	Date Received :	05/11/2014
Client :	Wardell Armstrong	Date Testing Started :	06/11/2014
Client Reference :	CSI4921	Date Testing Completed :	10/11/2014
Site Name :	Knoxbridge Farm, Kent, TN17 2BT	Laboratory :	Chelmer Geotechnical Laboratories, CM3 8AB



Notes :-

SILT (M-SOIL), M, plots below A-Line
CLAY, C, plots above A-Line }M and C may be combined as FINE SOIL, F.

Key :- BH1
BH2
BH3
BH4

UKAS TESTING
8284

Comments :-

Checked By :- MC Date Checked :- 10-Nov-14

Mark Collyer
Chelmer Site Investigation Laboratories Ltd
Unit 15
East Hanningfield Industrial Estate
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East Hanningfield
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CM3 8AB

QTS Environmental Ltd
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Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 14-26381

Site Reference:	Knoxbridge Farm, Kent, TN17 2BT
Project / Job Ref:	CSI4921
Order No:	PO/3247/4921/MC
Sample Receipt Date:	07/11/2014
Sample Scheduled Date:	07/11/2014
Report Issue Number:	1
Reporting Date:	13/11/2014

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate								
QTS Environmental Report No: 14-26381	**Date Sampled**	30/10/14	30/10/14	30/10/14	30/10/14	30/10/14
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Knoxbridge Farm, Kent, TN17 2BT	**TP / BH No**	58348	58354	58355	58357	58360
Project / Job Ref: CSI4921	**Additional Refs**	WS/BH1	WS/BH3	WS/BH3	WS/BH4	WS/BH4
Order No: PO/3247/4921/MC	**Depth (m)**	0.30	1.00	1.50	6.00	1.50
Reporting Date: 13/11/2014	**QTSE Sample No**	125088	125089	125090	125091	125092

Determinand	**Unit**	**RL**	**Accreditation**					
pH	pH Units	N/a	MCERTS	8.3	7.7	8.2	8.1	10.2
Total Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Total Sulphate as SO_4	mg/kg	< 200	NONE	722	566	974	1142	1295
W/S Sulphate as SO4 (2:1)	g/l	< 0.01	MCERTS	0.03	0.07	0.08	0.16	0.28
Total Sulphur	mg/kg	< 200	NONE	546	367			
Elemental Sulphur	mg/kg	< 10	NONE	< 10		< 10	< 10	< 10
Sulphide	mg/kg	< 5	NONE	< 5		< 5	< 5	< 5
Ammonium as NH_4	mg/kg	< 0.5	NONE	< 0.5	52.4			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	14	123			
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	10	5			
Arsenic (As)	mg/kg	< 2	MCERTS	< 2		4	4	8
Boron (B)	mg/kg	< 10	NONE	< 10		< 10	< 10	< 10
W/S Boron	mg/kg	< 1	NONE	< 1		1.1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5		< 0.5	< 0.5	< 0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	130		39	42	31
Copper (Cu)	mg/kg	< 4	MCERTS	20		114	61	26
Lead (Pb)	mg/kg	< 3	MCERTS	26		48	27	18
W/S Magnesium	g/l	< 0.0001	NONE	0.0047	0.0109			
Mercury (Hg)	mg/kg	< 1	NONE	< 1		< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	9		18	16	15
Selenium (Se)	mg/kg	< 3	NONE	< 3		< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	81		2090	249	81
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are dried at less than $30^{O}C$
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis $^{(S)}$

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

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Soil Analysis Certificate							
QTS Environmental Report No: 14-26381	**Date Sampled**	30/10/14					
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied					
Site Reference: Knoxbridge Farm, Kent, TN17 2BT	**TP / BH No**	58362					
Project / Job Ref: CSI4921	**Additional Refs**	WS/BH4					
Order No: PO/3247/4921/MC	**Depth (m)**	4.00					
Reporting Date: 13/11/2014	**QTSE Sample No**	125093					

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	9.3				
Total Cyanide	mg/kg	< 2	NONE					
Total Sulphate as SO_4	mg/kg	< 200	NONE	2265				
W/S Sulphate as SO4 (2:1)	g/l	< 0.01	MCERTS	0.73				
Total Sulphur	mg/kg	< 200	NONE	762				
Elemental Sulphur	mg/kg	< 10	NONE					
Sulphide	mg/kg	< 5	NONE					
Ammonium as NH_4	mg/kg	< 0.5	NONE	8.4				
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	120				
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	22				
Arsenic (As)	mg/kg	< 2	MCERTS					
Boron (B)	mg/kg	< 10	NONE					
W/S Boron	mg/kg	< 1	NONE					
Cadmium (Cd)	mg/kg	< 0.5	MCERTS					
Chromium (Cr)	mg/kg	< 2	MCERTS					
Copper (Cu)	mg/kg	< 4	MCERTS					
Lead (Pb)	mg/kg	< 3	MCERTS					
W/S Magnesium	g/l	< 0.0001	NONE	0.0599				
Mercury (Hg)	mg/kg	< 1	NONE					
Nickel (Ni)	mg/kg	< 3	MCERTS					
Selenium (Se)	mg/kg	< 3	NONE					
Zinc (Zn)	mg/kg	< 3	MCERTS					
Total Phenols (monohydric)	mg/kg	< 2	NONE					

Analytical results are expressed on a dry weight basis where samples are dried at less than $30^{O}C$
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis $^{(S)}$

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Soil Analysis Certificate - Speciated PAHs							
QTS Environmental Report No: 14-26381	**Date Sampled**	30/10/14	30/10/14	30/10/14	30/10/14	
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Knoxbridge Farm, Kent, TN17 2BT	**TP / BH No**	58348	58355	58357	58360	
Project / Job Ref: CSI4921	**Additional Refs**	WS/BH1	WS/BH3	WS/BH4	WS/BH4	
Order No: PO/3247/4921/MC	**Depth (m)**	0.30	1.50	6.00	1.50	
Reporting Date: 13/11/2014	**QTSE Sample No**	125088	125090	125091	125092	

Determinand	**Unit**	**RL**	**Accreditation**					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	0.30	0.69	0.23	< 0.1	
Anthracene	mg/kg	< 0.1	MCERTS	0.12	0.19	< 0.1	< 0.1	
Fluoranthene	mg/kg	< 0.1	MCERTS	0.67	1.21	0.59	< 0.1	
Pyrene	mg/kg	< 0.1	MCERTS	0.61	1.02	0.52	< 0.1	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.32	0.54	0.35	< 0.1	
Chrysene	mg/kg	< 0.1	MCERTS	0.33	0.48	0.35	< 0.1	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.45	0.59	0.44	< 0.1	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.19	0.19	0.15	< 0.1	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.38	0.50	0.36	< 0.1	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.22	0.27	0.22	< 0.1	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.33	0.26	0.20	< 0.1	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	3.9	6.1	3.4	< 1.6	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
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Soil Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 14-26381	**Date Sampled**	30/10/14	30/10/14	30/10/14	30/10/14	
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Knoxbridge Farm, Kent, TN17 2BT	**TP / BH No**	58348	58355	58357	58360	
Project / Job Ref: CSI4921	**Additional Refs**	WS/BH1	WS/BH3	WS/BH4	WS/BH4	
Order No: PO/3247/4921/MC	**Depth (m)**	0.30	1.50	6.00	1.50	
Reporting Date: 13/11/2014	**QTSE Sample No**	125088	125090	125091	125092	

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic >C8 - C10	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Aliphatic >C10 - C12	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Aliphatic >C12 - C16	mg/kg	< 1	NONE	7	< 1	< 1	< 1	
Aliphatic >C16 - C21	mg/kg	< 1	NONE	17	< 1	< 1	< 1	
Aliphatic >C21 - C34	mg/kg	< 6	NONE	69	22	< 6	< 6	
Aliphatic (C5 - C34)	mg/kg	< 12	NONE	93	22	< 12	< 12	
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aromatic >C8 - C10	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Aromatic >C10 - C12	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Aromatic >C12 - C16	mg/kg	< 1	NONE	3	< 1	< 1	< 1	
Aromatic >C16 - C21	mg/kg	< 1	NONE	50	8	2	< 1	
Aromatic >C21 - C35	mg/kg	< 6	NONE	198	19	< 6	< 6	
Aromatic (C5 - C35)	mg/kg	< 12	NONE	251	27	< 12	< 12	
Total >C5 - C35	mg/kg	< 24	NONE	344	49	< 24	< 24	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C

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4480

Soil Analysis Certificate - BTEX / MTBE							
QTS Environmental Report No: 14-26381	**Date Sampled**	30/10/14	30/10/14	30/10/14	30/10/14	
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Knoxbridge Farm, Kent, TN17 2BT	**TP / BH No**	58348	58355	58357	58360	
Project / Job Ref: CSI4921	**Additional Refs**	WS/BH1	WS/BH3	WS/BH4	WS/BH4	
Order No: PO/3247/4921/MC	**Depth (m)**	0.30	1.50	6.00	1.50	
Reporting Date: 13/11/2014	**QTSE Sample No**	125088	125090	125091	125092	

Determinand	**Unit**	**RL**	**Accreditation**					
Benzene	ug/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	
Toluene	ug/kg	< 5	**MCERTS**	< 5	< 5	< 5	< 5	
Ethylbenzene	ug/kg	< 10	**MCERTS**	< 10	< 10	< 10	< 10	
p & m-xylene	ug/kg	< 10	**MCERTS**	< 10	< 10	< 10	< 10	
o-xylene	ug/kg	< 10	**MCERTS**	< 10	< 10	< 10	< 10	
MTBE	ug/kg	< 5	**MCERTS**	< 5	< 5	< 5	< 5	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 14-26381	
Chelmer Site Investigation Laboratories Ltd	
Site Reference: Knoxbridge Farm, Kent, TN17 2BT	
Project / Job Ref: CSI4921	
Order No: PO/3247/4921/MC	
Reporting Date: 13/11/2014	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
125088	58348	WS/BH1	0.30	9.7	Black sand with concrete
125089	58354	WS/BH3	1.00	16.3	Light brown clayey gravel
125090	58355	WS/BH3	1.50	14.4	Brown clayey gravel with stones
125091	58357	WS/BH4	6.00	15.6	Brown clayey gravel
125092	58360	WS/BH4	1.50	19	Light brown clay
125093	58362	WS/BH4	4.00	22.1	Light brown clayey gravel

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

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Rose Lane
Lenham Heath
Maidstone
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4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 14-26381
Chelmer Site Investigation Laboratories Ltd
Site Reference: Knoxbridge Farm, Kent, TN17 2BT
Project / Job Ref: CSI4921
Order No: PO/3247/4921/MC
Reporting Date: 13/11/2014

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001

D Dried
AR As Received

Chelmer Site Investigations
Unit 15, East Hanningfield Industrial Estate, Old Church Road
East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 **Fax:** 01245 400 933
Email: info@siteinvestigations.co.uk **Website**: www.siteinvestigations.co.uk

REPORT NOTES

Equipment Used

Hand tools, Mechanical Concrete Breaker and Spade, Hand Augers, 100mm/150mm diameter Mechanical Flight Auger Rig, GEO205 Flight Auger Rig, Window Sampling Rig, and Large or Limited Access Shell & Auger Rig upon request and/or access permitting.

On Site Tests

By Pilcon Shear-Vane Tester (Kn/m^2) in clay soils, and/or Mackintosh Probe in granular soils or made ground and/or upon request Continuous Dynamic Probe Testing and Standard Penetration Testing.

Note:

Details reported in trial-pits and boreholes relate to positions investigated only as instructed by the client or engineer on the date shown.

We are therefore unable to accept any responsibility for changes in soil conditions not investigated i.e. variations due to climate, season, vegetation and varying ground water levels.

Full terms and conditions are available upon request.

Appendix D – Gas and Groundwater Monitoring Data

GROUND GAS MONITORING RECORD SHEET

CENTRAL ALLIANCE GEO

Client:	SWECO	**Job No:**	4246	**Instruments Used:**	GA
Project Name:	FRIDAYS AD PLANT	**Date:**	11/03/2019	**Make / Model :**	
Weather:	WINDY and SUNNY	**Monitored By:**	GS	**Serial Number:**	

Exploratory Hole No.	Peak [1]		Time to reach steady concentration (secs)	Steady [2]						Flow Rate Peak	Time to reach steady flow (secs)	Flow Rate Steady	Relative pressure	Atmospheric Pressure	Gas screening value	Characteristic situation	Water Depth	Base Depth	Water Level	Remarks
	CH_4	CO_2		CH_4	CO_2	O_2	H_2S [3]	CO [3]	PID											
	(% vol)	(% vol)		(% vol)	(% vol)	(% vol)	(ppm)	(ppm)	(ppm)	(L/hr)		(L/hr)	(mb)	(mbar)			(m bgl)	(m bgl)	(mAOD)	
BH01	0.1	0.4	180	0.1	0.2	21..1				-0.1	180	-0.1	-0.53	1019			1.65	7.95		
BH03	0.1	0.3	180	0.1	0.1	21.5				-0.2	180	-0.1	-0.64	1019			0.45	5.28		
BH04	0.1	0.1	180	0.1	0.1	21.5				0.1	180	0	0	1019			0.25	4.59		
BH08	0.1	0.5	180	0.1	0.4	20.8				-23.2	180	-14.4	-0.48	1019			1.30	5.00		

Background Atmospheric pressure:

	Day -3	Day -2	Day -1	First day onsite	Second day onsite	Day +1	Day +2	Day +3
Atmospheric Pressure (millibar)								
Trend								

Atmospheric pressure obtained from: http://www.metoffice.gov.uk/weather/uk/uk_latest_pressure.html

Ambient Gas Levels:

			CH_4 (%)	CO_2 (%)	O_2 (%)	H_2S (%)	CO (%)	PID ppm	Atmos (mbar)
Day 1	Before Monitoring		0.1	0.0	21.6				1019
	After Monitoring		0.1	0.0	21.6				1020
Day 2	Before Monitoring								
	After Monitoring								

1 The peak reading is the maximum recorded level during a monitoring event.
2 The steady reading is the level which remained constant after approximately 1 minute.
3 Recorded values are calculated from the Ambient Gas readings (live zero)

CENTRAL ALLIANCE GEO

Client:	SWECO	**Job No:**	4246	**Instruments Used:**	
Project Name:	FRIDAYS AD PLANT	**Date:**	18/04/2019	**Make / Model :**	
Weather:	Fine	**Monitored By:**	GS	**Serial Number:**	

Exploratory Hole No.	Peak [1]		Time to reach steady concentration (secs)	Steady [2]						Flow Rate Peak	Time to reach steady flow (secs)	Flow Rate Steady	Relative pressure	Atmospheric Pressure	Gas screening value	Characteristic situation	Water Depth	Base Depth	Water Level	Remarks
	CH_4	CO_2		CH_4	CO_2	O_2	H_2S	CO	PID											
	(% vol)	(% vol)		(% vol)	(% vol)	(% vol)	(ppm)	(ppm)	(ppm)	(L/hr)		(L/hr)	(mb)	(mbar)			(m bgl)	(m bgl)	(mAOD)	
BH01	0	0.2	180	0	0.1	21.4	`			0	180	0	-0.58	1016			1.59	7.97		
BH03	0	0.4	180	0	0.1	21.1				0.1	180	0.1	-0.62	1016			1.45	5.30		
BH04	0	0.1	180	0	0.1	21.3				0	180	0	-0.53	1016			0.32	4.6		
BH08	0.1	0.4	180	0	0.4	20.7				-21.9	180	-17.8	0.95	1016			1.31	5.02		

Background Atmospheric pressure:

	Day -3	Day -2	Day -1	First day onsite	Second day onsite	Day +1	Day +2	Day +3
Atmospheric Pressure (millibar)								
Trend								

Atmospheric pressure obtained from: http://www.metoffice.gov.uk/weather/uk/uk_latest_pressure.html

Ambient Gas Levels:

		CH_4 (%)	CO_2 (%)	O_2 (%)	H_2S (%)	CO (%)	PID ppm	Atmos (mbar)
Before Monitoring		0.0	0.0	21.5				1016
After Monitoring		0.0	0.0	21.5				1016

1 The peak reading is the maximum recorded level during a monitoring event.
2 The steady reading is the level which remained constant after approximately 1 minute.
3 Recorded values are calculated from the Ambient Gas readings (live zero)

GROUND GAS MONITORING RECORD SHEET

CENTRAL ALLIANCE GEO

Client:	SWECO	**Job No:**	4246	**Instruments Used:**	GA 2000 + Dipmeter
Project Name:	FRIDAYS AD PLANT	**Date:**	25/03/2019	**Make / Model :**	
Weather:	WINDY and SUNNY	**Monitored By:**	GS	**Serial Number:**	

Exploratory Hole No.	Peak [1]		Time to reach steady concentration (secs)	Steady [2]						Flow Rate Peak	Time to reach steady flow (secs)	Flow Rate Steady	Relative pressure	Atmospheric Pressure	Gas screening value	Characteristic situation	Water Depth	Base Depth	Water Level	Remarks
	CH_4 (% vol)	CO_2 (% vol)		CH_4 (% vol)	CO_2 (% vol)	O_2 (% vol)	H_2S [3] (ppm)	CO [3] (ppm)	PID (ppm)	(L/hr)		(L/hr)	(mb)	(mbar)			(m bgl)	(m bgl)	(mAOD)	
BH01	0.1	0.4	180	0.1	0.3	21..7				-17.8	180	-11.2	0.18	1025			1.61	7.98		
BH03	0	0.8	180	0	0.4	21.2				-0.2	180	0	-0.21	1025			1.41	5.25		
BH04	0	0.8	180	0	0.7	20				0	180	0	-0.02	1025			1.12	4.57		
BH08	0	0.6	180	0	0.5	20.2				-20.6	180	-7.2	0.68	1025			1.38	5.02		

Background Atmospheric pressure:

	Day -3	Day -2	Day -1	First day onsite	Second day onsite	Day +1	Day +2	Day +3
Atmospheric Pressure (millibar)								
Trend								

Atmospheric pressure obtained from: http://www.metoffice.gov.uk/weather/uk/uk_latest_pressure.html

Ambient Gas Levels:

			CH_4 (%)	CO_2 (%)	O_2 (%)	H_2S (%)	CO (%)	PID ppm	Atmos (mbar)
Day 1	Before Monitoring		0.0	0.0	20.6				1025
	After Monitoring		0.0	0.0	20.6				1025
Day 2	Before Monitoring								
	After Monitoring								

1 The peak reading is the maximum recorded level during a monitoring event.
2 The steady reading is the level which remained constant after approximately 1 minute.
3 Recorded values are calculated from the Ambient Gas readings (live zero)

Appendix E – Chemical Analysis Results

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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Zone 3
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Deeside
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Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	26th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 1
Location :	Fridays AD Plant
Date samples received :	27th February, 2019
Status :	Final report
Issue :	2

Eleven samples were received for analysis on 27th February, 2019 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	1-3	10-12	22-24										
Sample ID	BH06	BH05	BH01										
Depth	0.20	0.50	0.20										
COC No / misc											Please see attached notes for all abbreviations and acronyms		
Containers	V J T	V J T	V J T										
Sample Date	26/02/2019	26/02/2019	26/02/2019										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1								LOD/LOR	Units	Method No.
Date of Receipt	27/02/2019	27/02/2019	27/02/2019										
Arsenic #	11.9	20.1	13.7								<0.5	mg/kg	TM30/PM15
Cadmium #	0.3	0.2	0.3								<0.1	mg/kg	TM30/PM15
Chromium #	59.1	39.9	59.9								<0.5	mg/kg	TM30/PM15
Copper #	28	17	26								<1	mg/kg	TM30/PM15
Lead #	23	14	21								<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	0.1								<0.1	mg/kg	TM30/PM15
Nickel #	28.9	17.0	13.2								<0.7	mg/kg	TM30/PM15
Selenium #	2	4	2								<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	978	269	355								<50	mg/kg	TM50/PM29
Vanadium	45	35	43								<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.8	0.6	1.0								<0.1	mg/kg	TM74/PM32
Zinc #	148	60	101								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.07	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.34	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.11	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	0.19	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	2.10	<0.03	0.11								<0.03	mg/kg	TM4/PM8
Anthracene #	1.06	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	4.66	<0.03	0.16								<0.03	mg/kg	TM4/PM8
Pyrene #	4.19	<0.03	0.13								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	2.83	<0.06	0.11								<0.06	mg/kg	TM4/PM8
Chrysene #	2.36	<0.02	0.07								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	5.18	<0.07	0.11								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	3.10	<0.04	0.06								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	2.05	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.65	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.82	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 16 Total	30.7	<0.6	0.8								<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	3.73	<0.05	0.08								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.45	<0.02	0.03								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	105	103	91								<0	%	TM4/PM8

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	1-3	10-12	22-24									
Sample ID	BH06	BH05	BH01									
Depth	0.20	0.50	0.20									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	26/02/2019	26/02/2019	26/02/2019									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	27/02/2019	27/02/2019	27/02/2019									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C35-C44	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44	<26	<26	<26								<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	13	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	116	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC35-EC44	49	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44	178	<26	<26								<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44)	178	<52	<52								<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5								<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5								<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5								<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5								<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5								<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5								<5	ug/kg	TM31/PM12
Phenol #	<0.01	<0.01	<0.01								<0.01	mg/kg	TM26/PM21
Natural Moisture Content	20.0	19.0	20.9								<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6	<0.6	<0.6								<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5	<0.5								<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5	<0.5								<0.5	mg/kg	TM89/PM45
Organic Matter	2.2	0.3	1.2								<0.2	%	TM21/PM24
Thiocyanate	<0.6	<0.6	<0.6								<0.6	mg/kg	TM107/PM119

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	1-3	10-12	22-24									
Sample ID	BH06	BH05	BH01									
Depth	0.20	0.50	0.20									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	26/02/2019	26/02/2019	26/02/2019									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	27/02/2019	27/02/2019	27/02/2019									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
pH #	8.12	7.73	7.89								<0.01	pH units	TM73/PM11

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	10-12	22-24									LOD/LOR	Units	Method No.
Sample ID	BH05	BH01											
Depth	0.50	0.20											
COC No / misc													
Containers	V J T	V J T											
Sample Date	26/02/2019	26/02/2019											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	27/02/2019	27/02/2019											
Dissolved Arsenic #	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Boron #	21	25									<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	8									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	3	4									<3	ug/l	TM30/PM14
Total Dissolved Sulphur as S	1320	1115									<10	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Acenaphthene	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluorene	<0.014	<0.014									<0.014	ug/l	TM4/PM30
Phenanthrene	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Anthracene	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluoranthene	<0.012	<0.012									<0.012	ug/l	TM4/PM30
Pyrene	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	<0.015	<0.015									<0.015	ug/l	TM4/PM30
Chrysene	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.018	<0.018									<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	<0.016	<0.016									<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	<0.011									<0.011	ug/l	TM4/PM30
PAH 16 Total	<0.195	<0.195									<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	73	75									<0	%	TM4/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	10-12	22-24									LOD/LOR	Units	Method No.
Sample ID	BH05	BH01											
Depth	0.50	0.20											
COC No / misc													
Containers	V J T	V J T											
Sample Date	26/02/2019	26/02/2019											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	27/02/2019	27/02/2019											
TPH CWG													
Aliphatics													
>C5-C6	<10	<10									<10	ug/l	TM36/PM69
>C6-C8	<10	<10									<10	ug/l	TM36/PM69
>C8-C10	<10	<10									<10	ug/l	TM36/PM69
>C10-C12	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10									<10	ug/l	TM5/PM16/PM30
>C35-C44	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10	<10									<10	ug/l	TM5/TM36/PM16/PM30/PM69
Aromatics													
>C5-EC7	<10	<10									<10	ug/l	TM36/PM69
>EC7-EC8	<10	<10									<10	ug/l	TM36/PM69
>EC8-EC10	<10	<10									<10	ug/l	TM36/PM69
>EC10-EC12	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC35-EC44	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44	<10	<10									<10	ug/l	TM5/TM36/PM16/PM30/PM69
Total aliphatics and aromatics(C5-44)	<10	<10									<10	ug/l	TM5/TM36/PM16/PM30/PM69
MTBE	<5	<5									<5	ug/l	TM36/PM69
Benzene	<5	<5									<5	ug/l	TM36/PM69
Toluene	<5	<5									<5	ug/l	TM36/PM69
Ethylbenzene	<5	<5									<5	ug/l	TM36/PM69
m/p-Xylene	<5	<5									<5	ug/l	TM36/PM69
o-Xylene	<5	<5									<5	ug/l	TM36/PM69
Total Phenols HPLC	<0.05	<0.05									<0.05	mg/l	TM26/PM0
Sulphate as SO4 #	4.0	<0.5									<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.11	0.12									<0.03	mg/l	TM38/PM0
Free Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Sulphide	<0.01	<0.01									<0.01	mg/l	TM107/PM0
Thiocyanate	<0.02	<0.02									<0.02	mg/l	TM107/PM0
Hexavalent Chromium	<0.006	<0.006									<0.006	mg/l	TM38/PM0
pH	6.63	7.59									<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	1	BH06	0.20	3	08/03/2019	**General Description (Bulk Analysis)**	Soil/Stones
					08/03/2019	**Asbestos Fibres**	NAD
					08/03/2019	**Asbestos ACM**	NAD
					08/03/2019	**Asbestos Type**	NAD
					08/03/2019	**Asbestos Level Screen**	NAD
19/3146	1	BH05	0.50	12	08/03/2019	**General Description (Bulk Analysis)**	Soil/Stones
					08/03/2019	**Asbestos Fibres**	NAD
					08/03/2019	**Asbestos ACM**	NAD
					08/03/2019	**Asbestos Type**	NAD
					08/03/2019	**Asbestos Level Screen**	NAD
19/3146	1	BH01	0.20	24	08/03/2019	**General Description (Bulk Analysis)**	Soil/Stones
					08/03/2019	**Asbestos Fibres**	NAD
					08/03/2019	**Asbestos ACM**	NAD
					08/03/2019	**Asbestos Type**	NAD
					08/03/2019	**Asbestos Level Screen**	NAD

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM69	Modified BS EN 12457 method.One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes		AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.			AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	26th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 2
Location :	Fridays AD Plant
Date samples received :	1st March, 2019
Status :	Final report
Issue :	1

Nine samples were received for analysis on 1st March, 2019 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	34-36	52-54									LOD/LOR	Units	Method No.
Sample ID	BH08	BH07											
Depth	0.20	0.50											
COC No / misc													
Containers	V J T	V J T											
Sample Date	28/02/2019	27/02/2019											
Sample Type	Soil	Soil											
Batch Number	2	2											
Date of Receipt	01/03/2019	01/03/2019											
Arsenic #	9.0	22.6									<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	0.3									<0.1	mg/kg	TM30/PM15
Chromium #	53.9	66.4									<0.5	mg/kg	TM30/PM15
Copper #	18	21									<1	mg/kg	TM30/PM15
Lead #	16	23									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	16.5	16.6									<0.7	mg/kg	TM30/PM15
Selenium #	<1	3									<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	666	478									<50	mg/kg	TM50/PM29
Vanadium	35	52									<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.2	1.4									<0.1	mg/kg	TM74/PM32
Zinc #	86	79									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.21	<0.40 AA									<0.04	mg/kg	TM4/PM8
Acenaphthylene	2.61	<0.30 AA									<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.38	<0.50 AA									<0.05	mg/kg	TM4/PM8
Fluorene #	1.30	<0.40 AA									<0.04	mg/kg	TM4/PM8
Phenanthrene #	12.92	0.93 AA									<0.03	mg/kg	TM4/PM8
Anthracene #	4.85	<0.40 AA									<0.04	mg/kg	TM4/PM8
Fluoranthene #	20.41	1.19 AA									<0.03	mg/kg	TM4/PM8
Pyrene #	16.76	1.01 AA									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	9.84	0.87 AA									<0.06	mg/kg	TM4/PM8
Chrysene #	8.68	0.54 AA									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	14.65	<0.70 AA									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	7.74	<0.40 AA									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	4.77	<0.40 AA									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	1.52	<0.40 AA									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	3.86	<0.40 AA									<0.04	mg/kg	TM4/PM8
PAH 16 Total	110.5	<6.0 AA									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	10.55	<0.50 AA									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	4.10	<0.20 AA									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	106	96 AA									<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	34-36	52-54									LOD/LOR	Units	Method No.
Sample ID	BH08	BH07											
Depth	0.20	0.50											
COC No / misc													
Containers	V J T	V J T											
Sample Date	28/02/2019	27/02/2019											
Sample Type	Soil	Soil											
Batch Number	2	2											
Date of Receipt	01/03/2019	01/03/2019											
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C35-C44	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44	<26	<26									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	10									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	41									<7	mg/kg	TM5/PM8/PM16
>EC35-EC44	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44	<26	51									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44)	<52	<52									<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5									<5	ug/kg	TM31/PM12
Benzene #	<5	<5									<5	ug/kg	TM31/PM12
Toluene #	<5	<5									<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
Phenol #	<0.01	<0.01									<0.01	mg/kg	TM26/PM21
Natural Moisture Content	23.6	25.7									<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6	5.3									<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Organic Matter	1.8	1.0									<0.2	%	TM21/PM24
Thiocyanate	<0.6	<0.6									<0.6	mg/kg	TM107/PM119

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	34-36	52-54									LOD/LOR	Units	Method No.
Sample ID	BH08	BH07											
Depth	0.20	0.50											
COC No / misc													
Containers	V J T	V J T											
Sample Date	28/02/2019	27/02/2019											
Sample Type	Soil	Soil											
Batch Number	2	2											
Date of Receipt	01/03/2019	01/03/2019											
pH #	8.09	7.60									<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	52-54										Please see attached notes for all abbreviations and acronyms		
Sample ID	BH07												
Depth	0.50												
COC No / misc													
Containers	V J T												
Sample Date	27/02/2019												
Sample Type	Soil												
Batch Number	2										LOD/LOR	Units	Method No.
Date of Receipt	01/03/2019												
Dissolved Arsenic #	<2.5										<2.5	ug/l	TM30/PM14
Dissolved Boron #	24										<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5										<0.5	ug/l	TM30/PM14
Dissolved Chromium #	<1.5										<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7										<7	ug/l	TM30/PM14
Dissolved Lead #	<5										<5	ug/l	TM30/PM14
Dissolved Mercury #	<1										<1	ug/l	TM30/PM14
Dissolved Nickel #	<2										<2	ug/l	TM30/PM14
Dissolved Selenium #	<3										<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5										<1.5	ug/l	TM30/PM14
Dissolved Zinc #	<3										<3	ug/l	TM30/PM14
Total Dissolved Sulphur as S	12010										<10	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1										<0.1	ug/l	TM4/PM30
Acenaphthylene	0.039										<0.013	ug/l	TM4/PM30
Acenaphthene	0.292										<0.013	ug/l	TM4/PM30
Fluorene	0.096										<0.014	ug/l	TM4/PM30
Phenanthrene	0.155										<0.011	ug/l	TM4/PM30
Anthracene	0.044										<0.013	ug/l	TM4/PM30
Fluoranthene	0.197										<0.012	ug/l	TM4/PM30
Pyrene	0.133										<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	0.034										<0.015	ug/l	TM4/PM30
Chrysene	0.041										<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	0.045										<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	0.024										<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011										<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01										<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	0.015										<0.011	ug/l	TM4/PM30
PAH 16 Total	1.115										<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.03										<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	0.01										<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	80										<0	%	TM4/PM30

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	52-54										LOD/LOR	Units	Method No.
Sample ID	BH07												
Depth	0.50												
COC No / misc													
Containers	V J T												
Sample Date	27/02/2019												
Sample Type	Soil												
Batch Number	2												
Date of Receipt	01/03/2019												
TPH CWG													
Aliphatics													
>C5-C6	<10										<10	ug/l	TM36/PM69
>C6-C8	<10										<10	ug/l	TM36/PM69
>C8-C10	<10										<10	ug/l	TM36/PM69
>C10-C12	<5										<5	ug/l	TM5/PM16/PM30
>C12-C16	<10										<10	ug/l	TM5/PM16/PM30
>C16-C21	<10										<10	ug/l	TM5/PM16/PM30
>C21-C35	<10										<10	ug/l	TM5/PM16/PM30
>C35-C44	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10										<10	ug/l	TM5/TM36/PM16/PM30/PM69
Aromatics													
>C5-EC7	<10										<10	ug/l	TM36/PM69
>EC7-EC8	<10										<10	ug/l	TM36/PM69
>EC8-EC10	<10										<10	ug/l	TM36/PM69
>EC10-EC12	<5										<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10										<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10										<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10										<10	ug/l	TM5/PM16/PM30
>EC35-EC44	<10										<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44	<10										<10	ug/l	TM5/TM36/PM16/PM30/PM69
Total aliphatics and aromatics(C5-44)	<10										<10	ug/l	TM5/TM36/PM16/PM30/PM69
MTBE	<5										<5	ug/l	TM36/PM69
Benzene	<5										<5	ug/l	TM36/PM69
Toluene	<5										<5	ug/l	TM36/PM69
Ethylbenzene	<5										<5	ug/l	TM36/PM69
m/p-Xylene	<5										<5	ug/l	TM36/PM69
o-Xylene	<5										<5	ug/l	TM36/PM69
Total Phenols HPLC	<0.05										<0.05	mg/l	TM26/PM0
Sulphate as SO4 #	36.3										<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.77										<0.03	mg/l	TM38/PM0
Free Cyanide #	<0.01										<0.01	mg/l	TM89/PM0
Total Cyanide #	<0.01										<0.01	mg/l	TM89/PM0
Sulphide	<0.01										<0.01	mg/l	TM107/PM0
Thiocyanate	<0.02										<0.02	mg/l	TM107/PM0
Hexavalent Chromium	<0.006										<0.006	mg/l	TM38/PM0
pH	8.18										<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	2	BH08	0.20	36	13/03/2019	**General Description (Bulk Analysis)**	soil-stones
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD
19/3146	2	BH07	0.50	54	08/03/2019	**General Description (Bulk Analysis)**	Soil/Stones
					08/03/2019	**Asbestos Fibres**	NAD
					08/03/2019	**Asbestos ACM**	NAD
					08/03/2019	**Asbestos Type**	NAD
					08/03/2019	**Asbestos Level Screen**	NAD

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x10 Dilution

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM69	Modified BS EN 12457 method.One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes		AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.			AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	19th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 3
Location :	Fridays AD Plant
Date samples received :	1st March, 2019
Status :	Final report
Issue :	1

Ten samples were received for analysis on 1st March, 2019 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	61-63	85-87											
Sample ID	BH03	BH04											
Depth	0.20	1.40											
COC No / misc													
Containers	V J T	V J T											
Sample Date	28/02/2019	27/02/2019											
Sample Type	Soil	Soil											
Batch Number	3	3											
Date of Receipt	01/03/2019	01/03/2019											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Arsenic #	10.8	15.1									<0.5	mg/kg	TM30/PM15
Cadmium #	0.1	0.5									<0.1	mg/kg	TM30/PM15
Chromium #	62.7	33.7									<0.5	mg/kg	TM30/PM15
Copper #	31	25									<1	mg/kg	TM30/PM15
Lead #	21	19									<5	mg/kg	TM30/PM15
Mercury #	0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	24.3	38.9									<0.7	mg/kg	TM30/PM15
Selenium #	2	3									<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	370	231									<50	mg/kg	TM50/PM29
Vanadium	52	37									<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.5	0.7									<0.1	mg/kg	TM74/PM32
Zinc #	103	77									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.09	<0.03									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.20	<0.03									<0.03	mg/kg	TM4/PM8
Pyrene #	0.16	<0.03									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.12	<0.06									<0.06	mg/kg	TM4/PM8
Chrysene #	0.11	<0.02									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.17	<0.07									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.10	<0.04									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.09	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.09	<0.04									<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.1	<0.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.12	<0.05									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.05	<0.02									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	100	98									<0	%	TM4/PM8

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	61-63	85-87											
Sample ID	BH03	BH04											
Depth	0.20	1.40									Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J T	V J T											
Sample Date	28/02/2019	27/02/2019											
Sample Type	Soil	Soil											
Batch Number	3	3											
Date of Receipt	01/03/2019	01/03/2019									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C35-C44	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44	<26	<26									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC35-EC44	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44	<26	<26									<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44)	<52	<52									<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5									<5	ug/kg	TM31/PM12
Benzene #	<5	<5									<5	ug/kg	TM31/PM12
Toluene #	<5	<5									<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
Phenol #	<0.01	<0.01									<0.01	mg/kg	TM26/PM21
Natural Moisture Content	24.0	20.6									<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6	<0.6									<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Organic Matter	1.7	0.2									<0.2	%	TM21/PM24
Thiocyanate	1.0	<0.6									<0.6	mg/kg	TM107/PM119

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	61-63	85-87											
Sample ID	BH03	BH04											
Depth	0.20	1.40											
COC No / misc													
Containers	V J T	V J T											
Sample Date	28/02/2019	27/02/2019											
Sample Type	Soil	Soil											
Batch Number	3	3											
Date of Receipt	01/03/2019	01/03/2019											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
pH #	7.83	7.76									<0.01	pH units	TM73/PM11

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	3	BH03	0.20	63	13/03/2019	**General Description (Bulk Analysis)**	soil-stones
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD
19/3146	3	BH04	1.40	87	08/03/2019	**General Description (Bulk Analysis)**	Soil/Stones
					08/03/2019	**Asbestos Fibres**	NAD
					08/03/2019	**Asbestos ACM**	NAD
					08/03/2019	**Asbestos Type**	NAD
					08/03/2019	**Asbestos Level Screen**	NAD

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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Deeside
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Fax: +44 (0) 1244 833781

Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	19th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 4
Location :	Fridays AD Plant
Date samples received :	2nd March, 2019
Status :	Final report
Issue :	1

Five samples were received for analysis on 2nd March, 2019 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	103-105										LOD/LOR	Units	Method No.
Sample ID	BH02												
Depth	2.00												
COC No / misc													
Containers	V J T												
Sample Date	01/03/2019												
Sample Type	Soil												
Batch Number	4												
Date of Receipt	02/03/2019												
Arsenic #	20.5										<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1										<0.1	mg/kg	TM30/PM15
Chromium #	54.0										<0.5	mg/kg	TM30/PM15
Copper #	45										<1	mg/kg	TM30/PM15
Lead #	26										<5	mg/kg	TM30/PM15
Mercury #	<0.1										<0.1	mg/kg	TM30/PM15
Nickel #	49.6										<0.7	mg/kg	TM30/PM15
Selenium #	1										<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	443										<50	mg/kg	TM50/PM29
Vanadium	61										<1	mg/kg	TM30/PM15
Water Soluble Boron #	3.9										<0.1	mg/kg	TM74/PM32
Zinc #	96										<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04										<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03										<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05										<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04										<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03										<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03										<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03										<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06										<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02										<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07										<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04										<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6										<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05										<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02										<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	100										<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	103-105												
Sample ID	BH02												
Depth	2.00												
COC No / misc													
Containers	V J T												
Sample Date	01/03/2019												
Sample Type	Soil												
Batch Number	4												
Date of Receipt	02/03/2019												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1										<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1										<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1										<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4										<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7										<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7										<7	mg/kg	TM5/PM8/PM16
>C35-C44	<7										<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44	<26										<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1										<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1										<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1										<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4										<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7										<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7										<7	mg/kg	TM5/PM8/PM16
>EC35-EC44	<7										<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44	<26										<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44)	<52										<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5										<5	ug/kg	TM31/PM12
Benzene #	<5										<5	ug/kg	TM31/PM12
Toluene #	<5										<5	ug/kg	TM31/PM12
Ethylbenzene #	<5										<5	ug/kg	TM31/PM12
m/p-Xylene #	<5										<5	ug/kg	TM31/PM12
o-Xylene #	<5										<5	ug/kg	TM31/PM12
Phenol #	0.05										<0.01	mg/kg	TM26/PM21
Natural Moisture Content	21.0										<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6										<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3										<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5										<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5										<0.5	mg/kg	TM89/PM45
Organic Matter	0.6										<0.2	%	TM21/PM24
Thiocyanate	<0.6										<0.6	mg/kg	TM107/PM119

Client Name:	Central Alliance Pre Construction Services Ltd	**Report :**	**Solid**
Reference:	4246		
Location:	Fridays AD Plant	**Solids:**	V=60g VOC jar, J=250g glass jar, T=plastic tub
Contact:	Ben Haswell		
JE Job No.:	19/3146		

J E Sample No.	103-105										Please see attached notes for all abbreviations and acronyms		
Sample ID	BH02												
Depth	2.00												
COC No / misc													
Containers	V J T												
Sample Date	01/03/2019												
Sample Type	Soil												
Batch Number	4										LOD/LOR	Units	Method No.
Date of Receipt	02/03/2019												
pH #	8.16										<0.01	pH units	TM73/PM11

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	4	BH02	2.00	105	13/03/2019	**General Description (Bulk Analysis)**	soil-stones
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
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TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes

Exova Jones Environmental

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Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	28th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 6
Location :	Fridays AD Plant
Date samples received :	7th March, 2019
Status :	Final report
Issue :	1

Seventeen samples were received for analysis on 7th March, 2019 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Lucas Halliwell
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	121-123	130-132	133-135	142-144	145-147	154-156	160-162	163-165			LOD/LOR	Units	Method No.
Sample ID	TP12	TP13	TP14	TP15	TP16	TP17	TP18	TP19					
Depth	0.80	1.70	1.00	1.60	1.00	1.80	1.30	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	6	6	6	6	6	6	6	6					
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019					
Arsenic #	-	12.3	10.9	16.3	-	10.0	20.5	-			<0.5	mg/kg	TM30/PM15
Cadmium #	-	<0.1	0.3	<0.1	-	<0.1	<0.1	-			<0.1	mg/kg	TM30/PM15
Chromium #	-	45.7	83.4	75.2	-	42.3	45.2	-			<0.5	mg/kg	TM30/PM15
Copper #	-	19	42	17	-	19	21	-			<1	mg/kg	TM30/PM15
Lead #	-	14	24	20	-	17	15	-			<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	0.2	<0.1	-	<0.1	<0.1	-			<0.1	mg/kg	TM30/PM15
Nickel #	-	18.0	15.0	26.9	-	17.0	32.7	-			<0.7	mg/kg	TM30/PM15
Selenium #	-	<1	1	2	-	1	2	-			<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	-	129	442	172	-	153	229	-			<50	mg/kg	TM50/PM29
Vanadium	-	48	49	42	-	56	39	-			<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.8	1.5	0.8	-	0.9	0.4	-			<0.1	mg/kg	TM74/PM32
Zinc #	-	76	145	102	-	71	96	-			<5	mg/kg	TM30/PM15
Arsenic	9.6	-	-	-	7.9	-	-	12.3			<0.5	mg/kg	TM30/PM62
Cadmium	0.4	-	-	-	0.4	-	-	0.3			<0.1	mg/kg	TM30/PM62
Chromium	86.8	-	-	-	63.2	-	-	41.3			<0.5	mg/kg	TM30/PM62
Copper	43	-	-	-	47	-	-	45			<1	mg/kg	TM30/PM62
Lead	26	-	-	-	23	-	-	28			<5	mg/kg	TM30/PM62
Mercury	<0.1	-	-	-	<0.1	-	-	<0.1			<0.1	mg/kg	TM30/PM62
Nickel	13.6	-	-	-	13.3	-	-	13.7			<0.7	mg/kg	TM30/PM62
Selenium	<1	-	-	-	<1	-	-	3			<1	mg/kg	TM30/PM62
Total Sulphate as SO4	507	-	-	-	486	-	-	465			<50	mg/kg	TM50/PM29
Vanadium	48	-	-	-	43	-	-	50			<1	mg/kg	TM30/PM62
Water Soluble Boron	1.3	-	-	-	1.4	-	-	1.7			<0.1	mg/kg	TM74/PM61
Zinc	158	-	-	-	146	-	-	152			<5	mg/kg	TM30/PM62

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	121-123	130-132	133-135	142-144	145-147	154-156	160-162	163-165			LOD/LOR	Units	Method No.
Sample ID	TP12	TP13	TP14	TP15	TP16	TP17	TP18	TP19					
Depth	0.80	1.70	1.00	1.60	1.00	1.80	1.30	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	6	6	6	6	6	6	6	6					
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019					
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.04			<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.05	<0.03	0.05	0.05	0.09	<0.03	<0.03	0.12			<0.03	mg/kg	TM4/PM8
Pyrene #	0.05	<0.03	0.04	0.05	0.09	<0.03	<0.03	0.10			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.09			<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.06			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	0.10	<0.07	<0.07	0.14			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	0.06			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	0.06			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	0.06			<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	0.7			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	0.10			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.04			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	102	95	105	98	109	92	99	100			<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>C35-C44	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44	<26	<26	<26	<26	<26	<26	<26	<26			<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>EC35-EC44	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44	<26	<26	<26	<26	<26	<26	<26	<26			<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44)	<52	<52	<52	<52	<52	<52	<52	<52			<52	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	121-123	130-132	133-135	142-144	145-147	154-156	160-162	163-165			LOD/LOR	Units	Method No.
Sample ID	TP12	TP13	TP14	TP15	TP16	TP17	TP18	TP19					
Depth	0.80	1.70	1.00	1.60	1.00	1.80	1.30	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	6	6	6	6	6	6	6	6					
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019					
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
Phenol #	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	mg/kg	TM26/PM21
Natural Moisture Content	25.1	23.8	24.5	18.3	26.9	21.5	15.4	27.8			<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6			<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Organic Matter	NDP	0.4	3.8	1.1	NDP	0.8	0.4	NDP			<0.2	%	TM21/PM24
Thiocyanate	1.3	<0.6	1.1	<0.6	<0.6	<0.6	<0.6	1.0			<0.6	mg/kg	TM107/PM119
pH #	7.98	7.95	7.79	8.11	7.99	8.19	7.92	7.84			<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	121-123	133-135	145-147	160-162							LOD/LOR	Units	Method No.
Sample ID	TP12	TP14	TP16	TP18									
Depth	0.80	1.00	1.00	1.30									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	6	6	6	6									
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019									
Dissolved Arsenic #	3.8	<2.5	3.7	<2.5							<2.5	ug/l	TM30/PM14
Dissolved Boron #	25	21	23	19							<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM30/PM14
Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5							<1.5	ug/l	TM30/PM14
Dissolved Copper #	13	12	16	<7							<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5							<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1							<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	2	<2							<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	<3							<3	ug/l	TM30/PM14
Dissolved Vanadium #	8.8	8.0	9.0	<1.5							<1.5	ug/l	TM30/PM14
Dissolved Zinc #	<3	<3	<3	<3							<3	ug/l	TM30/PM14
Total Dissolved Sulphur as S	1384	1101	1183	7013							<10	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.013	<0.013	<0.013	<0.013							<0.013	ug/l	TM4/PM30
Acenaphthene	0.017	0.016	<0.013	<0.013							<0.013	ug/l	TM4/PM30
Fluorene	0.020	<0.014	<0.014	<0.014							<0.014	ug/l	TM4/PM30
Phenanthrene	0.030	0.039	0.017	<0.011							<0.011	ug/l	TM4/PM30
Anthracene	<0.013	<0.013	<0.013	<0.013							<0.013	ug/l	TM4/PM30
Fluoranthene	<0.012	<0.012	0.017	<0.012							<0.012	ug/l	TM4/PM30
Pyrene	<0.013	<0.013	0.015	<0.013							<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	<0.015	<0.015	<0.015	<0.015							<0.015	ug/l	TM4/PM30
Chrysene	<0.011	<0.011	0.018	<0.011							<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.018	<0.018	0.034	<0.018							<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	<0.016	<0.016	<0.016	<0.016							<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	<0.011	0.011	<0.011							<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01	<0.01	<0.01							<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	<0.011	0.019	<0.011							<0.011	ug/l	TM4/PM30
PAH 16 Total	<0.195	<0.195	<0.195	<0.195							<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	0.02	<0.01							<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	<0.01							<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	77	72	73	71							<0	%	TM4/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	121-123	133-135	145-147	160-162							LOD/LOR	Units	Method No.
Sample ID	TP12	TP14	TP16	TP18									
Depth	0.80	1.00	1.00	1.30									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	6	6	6	6									
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019									
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>C6-C8	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>C8-C10	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>C10-C12	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C35-C44	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM16/PM30/PM69
Aromatics													
>C5-EC7	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>EC7-EC8	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>EC8-EC10	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>EC10-EC12	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC35-EC44	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM16/PM30/PM69
Total aliphatics and aromatics(C5-44)	<10	<10	<10	<10							<10	ug/l	TM5/TM36/PM16/PM30/PM69
MTBE	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Benzene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Toluene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Ethylbenzene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
m/p-Xylene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
o-Xylene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Total Phenols HPLC	<0.05	<0.05	<0.05	<0.05							<0.05	mg/l	TM26/PM0
Sulphate as SO4 #	<0.5	<0.5	<0.5	22.8							<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.11	0.09	0.09	0.06							<0.03	mg/l	TM38/PM0
Free Cyanide #	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM89/PM0
Total Cyanide #	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM89/PM0
Sulphide	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM107/PM0
Thiocyanate	<0.02	<0.02	<0.02	<0.02							<0.02	mg/l	TM107/PM0
Hexavalent Chromium	<0.006	<0.006	<0.006	<0.006							<0.006	mg/l	TM38/PM0
pH	8.15	8.07	8.07	7.76							<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	6	TP12	0.80	123	13/03/2019	**General Description (Bulk Analysis)**	soil.stones
					13/03/2019	**Asbestos Fibres**	Fibre Bundles
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	Chrysotile
					13/03/2019	**Asbestos Level Screen**	less than 0.1%
					27/03/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					27/03/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					27/03/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					28/03/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					28/03/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
19/3146	6	TP13	1.70	132	13/03/2019	**General Description (Bulk Analysis)**	Soil/Stone
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD
19/3146	6	TP14	1.00	135	13/03/2019	**General Description (Bulk Analysis)**	soil.stones
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD
19/3146	6	TP15	1.60	144	13/03/2019	**General Description (Bulk Analysis)**	soil.stones
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD
19/3146	6	TP16	1.00	147	13/03/2019	**General Description (Bulk Analysis)**	soil.stones
					13/03/2019	**Asbestos Fibres**	Fibre Bundles
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	Chrysotile
					13/03/2019	**Asbestos Level Screen**	less than 0.1%
					27/03/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					27/03/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					27/03/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					28/03/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					28/03/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	6	TP17	1.80	156	13/03/2019	**General Description (Bulk Analysis)**	Soil/Stone
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD
19/3146	6	TP18	1.30	162	13/03/2019	**General Description (Bulk Analysis)**	Soil/Stone
					13/03/2019	**Asbestos Fibres**	NAD
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	NAD
					13/03/2019	**Asbestos Level Screen**	NAD
19/3146	6	TP19	1.00	165	13/03/2019	**General Description (Bulk Analysis)**	Soil/Stone
					13/03/2019	**Asbestos Fibres**	Fibre Bundles
					13/03/2019	**Asbestos ACM**	NAD
					13/03/2019	**Asbestos Type**	Chrysotile
					13/03/2019	**Asbestos Level Screen**	less than 0.1%
					27/03/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					27/03/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					27/03/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					28/03/2019	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					28/03/2019	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)

Client Name: Central Alliance Pre Construction Services Ltd **Matrix : Solid**
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Method No.	NDP Reason
19/3146	6	TP12	0.80	121-123	TM21/PM24	Asbestos detected in sample
19/3146	6	TP16	1.00	145-147	TM21/PM24	Asbestos detected in sample
19/3146	6	TP19	1.00	163-165	TM21/PM24	Asbestos detected in sample

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM69	Modified BS EN 12457 method.One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes		AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.			AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	20th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 7
Location :	Fridays AD Plant
Date samples received :	7th March, 2019
Status :	Final report
Issue :	1

Five samples were received for analysis on 7th March, 2019 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Lucas Halliwell
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Liquid

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	172-173	174-175	176-177	178-179	180-181						LOD/LOR	Units	Method No.
Sample ID	BH01A	BH01B	BH03	BH04	BH08								
Depth													
COC No / misc													
Containers	HN G	HN G	HN G	HN G	HN G								
Sample Date	05/03/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	7	7	7	7	7								
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019								
Dissolved Arsenic #	5.9	2.7	3.4	30.0	2.7						<2.5	ug/l	TM30/PM14
Dissolved Boron	326	438	283	129	775						<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5						<0.5	ug/l	TM30/PM14
Dissolved Calcium #	529.3$_{AA}$	459.3$_{AA}$	539.5$_{AA}$	69.5	590.3$_{AA}$						<0.2	mg/l	TM30/PM14
Total Dissolved Chromium #	5.6	3.3	<1.5	7.9	4.5						<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	36	<7						<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5						<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1						<1	ug/l	TM30/PM14
Dissolved Nickel #	3	3	3	4	20						<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	12	<3						<3	ug/l	TM30/PM14
Dissolved Vanadium #	1.6	<1.5	<1.5	19.3	<1.5						<1.5	ug/l	TM30/PM14
Dissolved Zinc #	12	9	14	21	35						<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	2740$_{AA}$	2372$_{AA}$	2815$_{AA}$	252	3193$_{AA}$						<1	mg/l	TM30/PM14
Total Sulphur as S	544900$_{AB}$	538900$_{AB}$	933000$_{AC}$	86300$_{AA}$	1519000$_{AD}$						<10	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1	3.8						<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013	<0.013	<0.013	0.070						<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	<0.013	<0.013	<0.013	0.029						<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	<0.014	<0.014	<0.014	0.058						<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	<0.011	<0.011	0.018	0.055						<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	<0.013	<0.013	<0.013	<0.013						<0.013	ug/l	TM4/PM30
Fluoranthene #	<0.012	<0.012	<0.012	0.090	0.017						<0.012	ug/l	TM4/PM30
Pyrene #	<0.013	<0.013	<0.013	0.084	0.017						<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	<0.015	<0.015	0.041	<0.015						<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	<0.011	<0.011	0.059	<0.011						<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.018	<0.018	<0.018	0.118	<0.018						<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016	<0.016	0.062	<0.016						<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011	<0.011	0.047	<0.011						<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011	<0.011	0.064	<0.011						<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	<0.195	<0.195	0.583	4.046						<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	0.08	<0.01						<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	0.03	<0.01						<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	82	80	86	82	80						<0	%	TM4/PM30

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Liquid

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	172-173	174-175	176-177	178-179	180-181						LOD/LOR	Units	Method No.
Sample ID	BH01A	BH01B	BH03	BH04	BH08								
Depth													
COC No / misc													
Containers	HN G	HN G	HN G	HN G	HN G								
Sample Date	05/03/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	7	7	7	7	7								
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019								
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5						<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>C35-C44	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10	<10	<10	<10	<10						<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10						<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5						<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
>EC35-EC44	<10	<10	<10	<10	<10						<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44	<10	<10	<10	<10	<10						<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-44)	<10	<10	<10	<10	<10						<10	ug/l	TM5/TM36/PM12/PM16/PM30
MTBE #	<5	<5	<5	<5	<5						<5	ug/l	TM31/PM12
Benzene #	<5	<5	<5	<5	<5						<5	ug/l	TM31/PM12
Toluene #	<5	<5	<5	<5	<5						<5	ug/l	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5						<5	ug/l	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5						<5	ug/l	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5						<5	ug/l	TM31/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15						<0.15	mg/l	TM26/PM0
Sulphate as SO4 #	1425.0	1456.5	2443.4	236.9	4196.2						<0.5	mg/l	TM38/PM0
Free Cyanide #	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	mg/l	TM89/PM0
Total Cyanide #	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	0.36	0.43	0.11	0.29	0.33						<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<0.006	<0.006	<0.006	<0.006	<0.006						<0.006	mg/l	TM38/PM0
Sulphide	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	mg/l	TM107/PM0
Thiocyanate	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/l	TM107/PM0
Dissolved Organic Carbon #	<2	<2	<2	25	<2						<2	mg/l	TM60/PM0

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Liquid

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

J E Sample No.	172-173	174-175	176-177	178-179	180-181						LOD/LOR	Units	Method No.
Sample ID	BH01A	BH01B	BH03	BH04	BH08								
Depth													
COC No / misc													
Containers	HN G	HN G	HN G	HN G	HN G								
Sample Date	05/03/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019								
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water								
Batch Number	7	7	7	7	7								
Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019								
Electrical Conductivity @25C #	5183	5198	6847	1254	8378						<2	uS/cm	TM76/PM0
pH #	7.48	7.53	7.57	7.92	7.45						<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution
AB	x10 Dilution
AC	x20 Dilution
AD	x50 Dilution

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.				

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	27th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 8
Location :	Fridays AD Plant
Date samples received :	8th March, 2019
Status :	Final report
Issue :	1

Fourteen samples were received for analysis on 8th March, 2019 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	185-187	197-199	206-208	215-217	218-220	221-223					LOD/LOR	Units	Method No.
Sample ID	TP4-ES3	TP1-ES3	TP7-ES1	TP7-ES8	TP8-ES1	TP8A-ES1							
Depth	0.50	0.50	0.20	1.50	1.0.	0.50							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	8	8	8	8	8	8							
Date of Receipt	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019							
Arsenic #	15.4	18.6	4.1	<0.5	12.8	7.2					<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	0.4					<0.1	mg/kg	TM30/PM15
Chromium #	91.0	84.0	85.5	<0.5	76.0	95.9					<0.5	mg/kg	TM30/PM15
Copper #	20	20	54	<1	20	29					<1	mg/kg	TM30/PM15
Lead #	23	15	10	<5	18	20					<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	mg/kg	TM30/PM15
Nickel #	22.5	19.9	31.8	<0.7	27.7	14.6					<0.7	mg/kg	TM30/PM15
Selenium #	2	2	<1	<1	2	<1					<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	269	163	374	334	657	1160					<50	mg/kg	TM50/PM29
Vanadium	47	51	70	<1	51	44					<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.9	1.1	1.3	3.8	4.0	4.5					<0.1	mg/kg	TM74/PM32
Zinc #	82	75	74	<5	95	130					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.40 AB	<0.04	<0.04	0.08					<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	1.04 AB	<0.03	<0.03	0.08					<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	1.08 AB	<0.05	<0.05	0.14					<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	1.33 AB	<0.04	<0.04	0.22					<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	21.52 AB	<0.03	0.06	1.47					<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	8.03 AB	<0.04	<0.04	0.49					<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	39.51 AB	<0.03	0.19	2.56					<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	33.31 AB	<0.03	0.17	2.14					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	18.17 AB	<0.06	0.14	1.10					<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	17.45 AB	<0.02	0.10	1.17					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	34.43 AB	<0.07	0.24	2.13					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	19.38 AB	<0.04	0.12	1.20					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	12.53 AB	<0.04	0.09	0.84					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	2.04 AB	<0.04	<0.04	0.13					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	10.94 AB	<0.04	0.09	0.77					<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	220.8 AB	<0.6	1.2	14.5					<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	24.79 AB	<0.05	0.17	1.53					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	9.64 AB	<0.02	0.07	0.60					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	83	99	92 AB	88	94	81					<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	185-187	197-199	206-208	215-217	218-220	221-223					LOD/LOR	Units	Method No.
Sample ID	TP4-ES3	TP1-ES3	TP7-ES1	TP7-ES8	TP8-ES1	TP8A-ES1							
Depth	0.50	0.50	0.20	1.50	1.0.	0.50							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	8	8	8	8	8	8							
Date of Receipt	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019							
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.2 SV AA	<0.1	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.2 SV AA	<0.1	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.2 SV AA	<0.1	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	46	<7	72	115					<7	mg/kg	TM5/PM8/PM16
>C35-C44	<7	<7	36	<7	13	97					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44	<26	<26	82	<26	85	212					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.2 SV AA	<0.1	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.2 SV AA	<0.1	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.2 SV AA	<0.1	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2 SV	<0.2	<0.2	1.3					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4 SV	<4	<4	10					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	9 SV	<7	63	70					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	212 SV	39	426	522					<7	mg/kg	TM5/PM8/PM16
>EC35-EC44	<7	<7	194 SV	32	131	361					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44	<26	<26	415 SV	71	620	964					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44)	<52	<52	497 SV	71	705	1176					<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<10 SV AA	<5	<5	<5					<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<10 SV AA	<5	<5	<5					<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<10 SV AA	<5	<5	<5					<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<10 SV AA	<5	<5	<5					<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<10 SV AA	<5	<5	<5					<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<10 SV AA	<5	<5	<5					<5	ug/kg	TM31/PM12
Phenol #	<0.01	<0.01	<0.01	<0.01	0.08	<0.01					<0.01	mg/kg	TM26/PM21
Natural Moisture Content	19.1	14.9	9.8	18.3	28.7	16.5					<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6	<0.6	2.9	<0.6	59.2	275.1					<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3					<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	1.2					<0.5	mg/kg	TM89/PM45
Organic Matter	0.7	0.5	3.9	0.2	1.1	5.8					<0.2	%	TM21/PM24
Thiocyanate	<0.6	<0.6	<0.6	<0.6	<0.6	1.4					<0.6	mg/kg	TM107/PM119

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	185-187	197-199	206-208	215-217	218-220	221-223					LOD/LOR	Units	Method No.
Sample ID	TP4-ES3	TP1-ES3	TP7-ES1	TP7-ES8	TP8-ES1	TP8A-ES1							
Depth	0.50	0.50	0.20	1.50	1.0.	0.50							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	8	8	8	8	8	8							
Date of Receipt	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019							
pH #	7.90	7.30	8.55	8.16	8.03	9.04					<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	185-187	215-217	218-220									
Sample ID	TP4-ES3	TP7-ES8	TP8-ES1									
Depth	0.50	1.50	1.0.									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	07/03/2019	07/03/2019	07/03/2019									
Sample Type	Soil	Soil	Soil									
Batch Number	8	8	8									
Date of Receipt	08/03/2019	08/03/2019	08/03/2019									

Please see attached notes for all abbreviations and acronyms

				LOD/LOR	Units	Method No.
Dissolved Arsenic #	<2.5	<2.5	8.7	<2.5	ug/l	TM30/PM14
Dissolved Boron #	29	48	65	<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	ug/l	TM30/PM14
Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	21	<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5	2.6	<1.5	ug/l	TM30/PM14
Dissolved Zinc #	4	<3	<3	<3	ug/l	TM30/PM14
Total Dissolved Sulphur as S	1498	11240	12360	<10	ug/l	TM30/PM14
PAH MS						
Naphthalene	<0.1	<0.1	0.3	<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.013	<0.013	0.073	<0.013	ug/l	TM4/PM30
Acenaphthene	0.019	0.020	0.636	<0.013	ug/l	TM4/PM30
Fluorene	0.024	0.015	0.406	<0.014	ug/l	TM4/PM30
Phenanthrene	0.029	0.018	1.019	<0.011	ug/l	TM4/PM30
Anthracene	<0.013	<0.013	0.294	<0.013	ug/l	TM4/PM30
Fluoranthene	<0.012	<0.012	1.553	<0.012	ug/l	TM4/PM30
Pyrene	<0.013	<0.013	1.312	<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	<0.015	<0.015	0.536	<0.015	ug/l	TM4/PM30
Chrysene	<0.011	<0.011	0.580	<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.018	<0.018	1.284	<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	<0.016	<0.016	0.761	<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	<0.011	0.282	<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01	0.06	<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	<0.011	0.226	<0.011	ug/l	TM4/PM30
PAH 16 Total	<0.195	<0.195	9.322	<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	0.92	<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	0.36	<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	73	78	73	<0	%	TM4/PM30

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	185-187	215-217	218-220									
Sample ID	TP4-ES3	TP7-ES8	TP8-ES1									
Depth	0.50	1.50	1.0.									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	07/03/2019	07/03/2019	07/03/2019									
Sample Type	Soil	Soil	Soil									
Batch Number	8	8	8									
Date of Receipt	08/03/2019	08/03/2019	08/03/2019									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10								<10	ug/l	TM36/PM69
>C6-C8	<10	<10	<10								<10	ug/l	TM36/PM69
>C8-C10	<10	<10	<10								<10	ug/l	TM36/PM69
>C10-C12	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C35-C44	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10	<10	<10								<10	ug/l	TM5/TM36/PM16/PM30/PM69
Aromatics													
>C5-EC7	<10	<10	<10								<10	ug/l	TM36/PM69
>EC7-EC8	<10	<10	<10								<10	ug/l	TM36/PM69
>EC8-EC10	<10	<10	<10								<10	ug/l	TM36/PM69
>EC10-EC12	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	<10	20								<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	20								<10	ug/l	TM5/PM16/PM30
>EC35-EC44	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44	<10	<10	40								<10	ug/l	TM5/TM36/PM16/PM30/PM69
Total aliphatics and aromatics(C5-44)	<10	<10	40								<10	ug/l	TM5/TM36/PM16/PM30/PM69
MTBE	<5	<5	<5								<5	ug/l	TM36/PM69
Benzene	<5	<5	<5								<5	ug/l	TM36/PM69
Toluene	<5	<5	<5								<5	ug/l	TM36/PM69
Ethylbenzene	<5	<5	<5								<5	ug/l	TM36/PM69
m/p-Xylene	<5	<5	<5								<5	ug/l	TM36/PM69
o-Xylene	<5	<5	<5								<5	ug/l	TM36/PM69
Total Phenols HPLC	<0.05	<0.05	<0.05								<0.05	mg/l	TM26/PM0
Sulphate as SO4 #	4.4	33.6	34.3								<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.12	0.05	57.50								<0.03	mg/l	TM38/PM0
Free Cyanide #	<0.01	<0.01	<0.01								<0.01	mg/l	TM89/PM0
Total Cyanide #	<0.01	<0.01	0.02								<0.01	mg/l	TM89/PM0
Sulphide	<0.01	<0.01	<0.01								<0.01	mg/l	TM107/PM0
Thiocyanate	<0.02	<0.02	<0.02								<0.02	mg/l	TM107/PM0
Hexavalent Chromium	<0.006	<0.006	<0.006								<0.006	mg/l	TM38/PM0
pH	7.75	8.20	8.67								<0.01	pH units	TM73/PM0

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	8	TP4-ES3	0.50	186	20/03/2019	**General Description (Bulk Analysis)**	soil/stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	8	TP1-ES3	0.50	199	20/03/2019	**General Description (Bulk Analysis)**	soil/stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	8	TP7-ES1	0.20	208	20/03/2019	**General Description (Bulk Analysis)**	soil/stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	8	TP7-ES8	1.50	216	20/03/2019	**General Description (Bulk Analysis)**	soil.stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	8	TP8-ES1	1.0.	219	20/03/2019	**General Description (Bulk Analysis)**	soil.stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	8	TP8A-ES1	0.50	223	20/03/2019	**General Description (Bulk Analysis)**	soil-stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x10 Dilution

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM69	Modified BS EN 12457 method.One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes		AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.			AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Exova Jones Environmental

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Central Alliance Pre Construction Services Ltd
Central Alliance, Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

Attention :	Ben Haswell
Date :	27th March, 2019
Your reference :	4246
Our reference :	Test Report 19/3146 Batch 9
Location :	Fridays AD Plant
Date samples received :	9th March, 2019
Status :	Final report
Issue :	1

Twenty two samples were received for analysis on 9th March, 2019 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	227-229	242-244	251-253	257-259	263-265	275-277	281-283				LOD/LOR	Units	Method No.
Sample ID	TP2	TP3	TP5	TP5	TP6	TP20	TP21						
Depth	0.50	1.00	0.50	1.50	0.50	1.00	1.00						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	9	9	9	9	9	9	9						
Date of Receipt	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019						
Arsenic #	11.7	18.0	11.4	15.9	12.2	9.7	10.7				<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.3				<0.1	mg/kg	TM30/PM15
Chromium #	69.2	96.5	76.2	51.9	89.7	119.4	89.9				<0.5	mg/kg	TM30/PM15
Copper #	22	18	11	29	24	27	38				<1	mg/kg	TM30/PM15
Lead #	19	15	18	27	19	19	26				<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Nickel #	20.4	20.0	17.5	54.2	30.2	17.2	18.8				<0.7	mg/kg	TM30/PM15
Selenium #	1	1	<1	<1	1	2	2				<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	181	194	269	938	871	495	641				<50	mg/kg	TM50/PM29
Vanadium	57	44	50	51	46	43	59				<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.8	0.6	0.9	2.2	1.9	2.0	2.5				<0.1	mg/kg	TM74/PM32
Zinc #	68	61	69	87	91	109	136				<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	0.22	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	0.06	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	0.41	0.08	<0.03				<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	0.35	0.08	<0.03				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	0.23	0.08	<0.06				<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02	0.19	0.05	<0.02				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	0.34	0.10	<0.07				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	0.19	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	0.14	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	0.13	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6	2.3	<0.6	<0.6				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	0.24	0.07	<0.05				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	0.10	0.03	<0.02				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	83	88	76	98	91	100	88				<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	227-229	242-244	251-253	257-259	263-265	275-277	281-283				LOD/LOR	Units	Method No.
Sample ID	TP2	TP3	TP5	TP5	TP6	TP20	TP21						
Depth	0.50	1.00	0.50	1.50	0.50	1.00	1.00						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	9	9	9	9	9	9	9						
Date of Receipt	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019						
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV				<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV				<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C35-C44	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44	<26	<26	<26	<26	<26	<26	<26				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV				<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	9	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	80	15	13				<7	mg/kg	TM5/PM8/PM16
>EC35-EC44	<7	<7	<7	<7	44	23	25				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44	<26	<26	<26	<26	133	38	38				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44)	<52	<52	<52	<52	133	<52	<52				<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5 SV				<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5 SV				<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5 SV				<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5 SV				<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5 SV				<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5 SV				<5	ug/kg	TM31/PM12
Phenol #	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				<0.01	mg/kg	TM26/PM21
Natural Moisture Content	26.9	16.6	21.0	25.0	26.7	28.8	31.1				<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6	<0.6	<0.6	<0.6	3.5	<0.6	<0.6				<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5				<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5				<0.5	mg/kg	TM89/PM45
Organic Matter	0.3	0.2	0.7	0.3	1.1	2.4	3.4				<0.2	%	TM21/PM24
Thiocyanate	<0.6	<0.6	<0.6	<0.6	<0.6	0.8	<0.6				<0.6	mg/kg	TM107/PM119

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : Solid

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

J E Sample No.	227-229	242-244	251-253	257-259	263-265	275-277	281-283				LOD/LOR	Units	Method No.
Sample ID	TP2	TP3	TP5	TP5	TP6	TP20	TP21						
Depth	0.50	1.00	0.50	1.50	0.50	1.00	1.00						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	9	9	9	9	9	9	9						
Date of Receipt	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019	09/03/2019						
pH #	8.35	8.09	8.21	7.90	8.24	7.92	7.95				<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	227-229	242-244	251-253	281-283							LOD/LOR	Units	Method No.
Sample ID	TP2	TP3	TP5	TP21									
Depth	0.50	1.00	0.50	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	9	9	9	9									
Date of Receipt	09/03/2019	09/03/2019	09/03/2019	09/03/2019									
Dissolved Arsenic #	<2.5	<2.5	<2.5	2.6							<2.5	ug/l	TM30/PM14
Dissolved Boron #	20	13	13	21							<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM30/PM14
Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5							<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7							<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5							<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1							<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	<2	<2							<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	<3							<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5	<1.5	<1.5							<1.5	ug/l	TM30/PM14
Dissolved Zinc #	4	<3	<3	<3							<3	ug/l	TM30/PM14
Total Dissolved Sulphur as S	1337	2290	2564	1362							<10	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene	0.032	<0.013	<0.013	<0.013							<0.013	ug/l	TM4/PM30
Acenaphthene	0.016	0.022	<0.013	<0.013							<0.013	ug/l	TM4/PM30
Fluorene	0.038	0.025	<0.014	0.020							<0.014	ug/l	TM4/PM30
Phenanthrene	0.064	0.066	<0.011	0.019							<0.011	ug/l	TM4/PM30
Anthracene	<0.013	<0.013	<0.013	<0.013							<0.013	ug/l	TM4/PM30
Fluoranthene	<0.012	<0.012	<0.012	<0.012							<0.012	ug/l	TM4/PM30
Pyrene	<0.013	<0.013	<0.013	<0.013							<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	<0.015	<0.015	<0.015	<0.015							<0.015	ug/l	TM4/PM30
Chrysene	<0.011	<0.011	<0.011	<0.011							<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.018	<0.018	<0.018	<0.018							<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	<0.016	<0.016	<0.016	<0.016							<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	<0.011	<0.011	<0.011							<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01	<0.01	<0.01							<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	<0.011	<0.011	<0.011							<0.011	ug/l	TM4/PM30
PAH 16 Total	<0.195	<0.195	<0.195	<0.195							<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	<0.01							<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	<0.01							<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	76	73	72	76							<0	%	TM4/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell
JE Job No.: 19/3146

Report : CEN 10:1 1 Batch

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

J E Sample No.	227-229	242-244	251-253	281-283							LOD/LOR	Units	Method No.
Sample ID	TP2	TP3	TP5	TP21									
Depth	0.50	1.00	0.50	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	07/03/2019	07/03/2019	07/03/2019	07/03/2019									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	9	9	9	9									
Date of Receipt	09/03/2019	09/03/2019	09/03/2019	09/03/2019									
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>C6-C8	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>C8-C10	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>C10-C12	<5	724	<5	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	650	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	780	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	1520	<10	<10							<10	ug/l	TM5/PM16/PM30
>C35-C44	<10	50	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10	3724	<10	<10							<10	ug/l	TM5/TM36/PM16/PM30/PM69
Aromatics													
>C5-EC7	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>EC7-EC8	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>EC8-EC10	<10	<10	<10	<10							<10	ug/l	TM36/PM69
>EC10-EC12	<5	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	160	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	220	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC35-EC44	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44	<10	380	<10	<10							<10	ug/l	TM5/TM36/PM16/PM30/PM69
Total aliphatics and aromatics(C5-44)	<10	4104	<10	<10							<10	ug/l	TM5/TM36/PM16/PM30/PM69
MTBE	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Benzene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Toluene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Ethylbenzene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
m/p-Xylene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
o-Xylene	<5	<5	<5	<5							<5	ug/l	TM36/PM69
Total Phenols HPLC	<0.05	<0.05	<0.05	<0.05							<0.05	mg/l	TM26/PM0
Sulphate as SO4 #	3.9	6.3	8.6	<0.5							<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.12	0.11	0.12	0.10							<0.03	mg/l	TM38/PM0
Free Cyanide #	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM89/PM0
Total Cyanide #	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM89/PM0
Sulphide	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM107/PM0
Thiocyanate	<0.02	<0.02	<0.02	<0.02							<0.02	mg/l	TM107/PM0
Hexavalent Chromium	<0.006	<0.006	<0.006	<0.006							<0.006	mg/l	TM38/PM0
pH	7.79	7.62	7.69	8.11							<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	9	TP2	0.50	228	20/03/2019	**General Description (Bulk Analysis)**	soil-stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	9	TP3	1.00	243	20/03/2019	**General Description (Bulk Analysis)**	soil-stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	9	TP5	0.50	252	20/03/2019	**General Description (Bulk Analysis)**	soil-stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	9	TP5	1.50	259	20/03/2019	**General Description (Bulk Analysis)**	soil/stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	9	TP6	0.50	265	20/03/2019	**General Description (Bulk Analysis)**	soil/stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	9	TP20	1.00	277	20/03/2019	**General Description (Bulk Analysis)**	soil/stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD
					20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD
19/3146	9	TP21	1.00	282	20/03/2019	**General Description (Bulk Analysis)**	soil-stones
					20/03/2019	**Asbestos Fibres**	NAD
					20/03/2019	**Asbestos ACM**	NAD

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3146	9	TP21	1.00	282	20/03/2019	**Asbestos Type**	NAD
					20/03/2019	**Asbestos Level Screen**	NAD

Client Name: Central Alliance Pre Construction Services Ltd
Reference: 4246
Location: Fridays AD Plant
Contact: Ben Haswell

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3146						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3146

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM69	Modified BS EN 12457 method.One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

JE Job No: 19/3146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes		AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.			AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Appendix F – Screened Chemical Analysis Results

Screened Chemical Analysis Results

SWECO

Contents

SWECO

Knoxbridge Farm

Tier 1 Screened Chemical Analysis Results: Soil Commercial 1%. Protective of Human Health.

					Interpretation:	Ground																			Bund									
					Sample ID	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	TP1	TP2	TP3	TP4	TP5	TP5	TP6	TP7	TP7	TP8	TP8A	TP12	TP13	TP14	TP15	TP16	TP17	TP18	TP19	TP20	TP21
					Depth (m)	0.20	2.00	0.20	1.40	0.50	0.20	0.50	0.20	0.50	0.50	1.00	0.50	0.50	1.50	0.50	0.20	1.50	1.0.	0.50	0.80	1.70	1.00	1.60	1.00	1.80	1.30	1.00	1.00	1.00
					Sample Date	26/02/2019	01/03/2019	28/02/2019	27/02/2019	26/02/2019	26/02/2019	27/02/2019	28/02/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	07/03/2019	07/03/2019
					Date of Receipt	27/02/2019	02/03/2019	01/03/2019	01/03/2019	27/02/2019	27/02/2019	01/03/2019	01/03/2019	08/03/2019	09/03/2019	09/03/2019	08/03/2019	09/03/2019	09/03/2019	09/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	09/03/2019	09/03/2019
	Analyte		Units	LOD	GAC																													
Metals and Inorganics	Asbestos		Presence	-	-	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	Chrysotile	NAD	NAD	NAD	Chrysotile	NAD	NAD	Chrysotile	NAD	NAD
	Asbestos		Type	-	-	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	Fibre Bundles	NAD	NAD	NAD	Fibre Bundles	NAD	NAD	Fibre Bundles	NAD	NAD
	Asbestos		%	-	-	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	<0.001	NA	NA	NA	<0.001	NA	NA	<0.001	NAD	NAD
	Arsenic		mg/kg	<0.5	640	13.7	20.5	10.8	15.1	20.1	11.9	22.6	9	18.6	11.7	18	15.4	11.4	15.9	12.2	4.1	<0.5	12.8	7.2	9.6	12.3	10.9	16.3	7.9	10	20.5	12.3	9.7	10.7
	Cadmium		mg/kg	<0.1	190	0.3	<0.1	0.1	0.5	0.2	0.3	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	0.4	<0.1	0.3	<0.1	0.4	<0.1	<0.1	0.3	0.3	0.3
	Chromium		mg/kg	<0.5	8600	59.9	54	62.7	33.7	39.9	59.1	66.4	53.9	84	69.2	96.5	91	76.2	51.9	89.7	85.5	<0.5	76	95.9	86.8	45.7	83.4	75.2	63.2	42.3	45.2	41.3	119.4	89.9
	Copper		mg/kg	<1	68000	26	45	31	25	17	28	21	18	20	22	18	20	11	29	24	54	<1	20	29	43	19	42	17	47	19	21	45	27	38
	Lead*		mg/kg	<5	2320	21	26	21	19	14	23	23	16	15	19	15	23	18	27	19	10	<5	18	20	26	14	24	20	23	17	15	28	19	26
	Mercury		mg/kg	<0.1	1100	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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel		mg/kg	<0.7	980	13.2	49.6	24.3	38.9	17	28.9	16.6	16.5	19.9	20.4	20	22.5	17.5	54.2	30.2	31.8	<0.7	27.7	14.6	13.6	18	15	26.9	13.3	17	32.7	13.7	17.2	18.8
	Selenium		mg/kg	<1	12000	2	1	2	3	4	2	3	<1	2	1	1	2	<1	<1	1	<1	<1	2	<1	<1	<1	1	2	<1	1	2	3	2	2
	Total Sulphate as SO4		mg/kg	<50	-	355	443	370	231	269	978	478	666	163	181	194	269	269	938	871	374	334	657	1160	507	129	442	172	486	153	229	465	495	641
	Vanadium		mg/kg	<1	9000	43	61	52	37	35	45	52	35	51	57	44	47	50	51	46	70	<1	51	44	48	48	49	42	43	56	39	50	43	59
	Water Soluble Boron		mg/kg	<0.1	240000	1	3.9	1.5	0.7	0.6	1.8	1.4	1.2	1.1	0.8	0.6	0.9	0.9	2.2	1.9	1.3	3.8	4	4.5	1.3	0.8	1.5	0.8	1.4	0.9	0.4	1.7	2	2.5
	Zinc		mg/kg	<5	730000	101	96	103	77	60	148	79	86	75	68	61	82	69	87	91	74	<5	95	130	158	76	145	102	146	71	96	152	109	136
	Free Cyanide***		mg/kg	<0.5	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total Cyanide		mg/kg	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Ammoniacal Nitrogen as N		mg/kg	<0.6	-	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	5.3	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	3.5	2.9	<0.6	59.2	275.1	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
	Hexavalent Chromium		mg/kg	<0.3	33	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	Thiocyanate		mg/kg	<0.6	-	<0.6	<0.6	1	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.4	1.3	<0.6	1.1	<0.6	<0.6	<0.6	<0.6	1	0.8	<0.6
	Organic Matter		%	<0.2	-	1.2	0.6	1.7	0.2	0.3	2.2	1	1.8	0.5	0.3	0.2	0.7	0.7	0.3	1.1	3.9	0.2	1.1	5.8	NDP	0.4	3.8	1.1	NDP	0.8	0.4	NDP	2.4	3.4
	pH		pH units	<0.01	-	7.89	8.16	7.83	7.76	7.73	8.12	7.6	8.09	7.3	8.35	8.09	7.9	8.21	7.9	8.24	8.55	8.16	8.03	9.04	7.98	7.95	7.79	8.11	7.99	8.19	7.92	7.84	7.92	7.95
	Natural Moisture Content		%	<0.1	-	20.9	21	24	20.6	19	20	25.7	23.6	14.9	26.9	16.6	19.1	21	25	26.7	9.8	18.3	28.7	16.5	25.1	23.8	24.5	18.3	26.9	21.5	15.4	27.8	28.8	31.1
PAH	Naphthalene		mg/kg	<0.04	190	<0.04	<0.04	<0.04	<0.04	<0.04	0.07	<0.40	0.21	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.40	<0.04	<0.04	0.08	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Acenaphthylene		mg/kg	<0.03	83000	<0.03	<0.03	<0.03	<0.03	<0.03	0.34	<0.30	2.61	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.04	<0.03	<0.03	0.08	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
	Acenaphthene		mg/kg	<0.05	84000	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	<0.50	0.38	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.08	<0.05	<0.05	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Fluorene		mg/kg	<0.04	63000	<0.04	<0.04	<0.04	<0.04	<0.04	0.19	<0.40	1.3	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	1.33	<0.04	<0.04	0.22	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Phenanthrene		mg/kg	<0.03	22000	0.11	<0.03	0.09	<0.03	<0.03	2.1	0.93	12.92	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.22	21.52	<0.03	0.06	1.47	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.04	<0.03	<0.03
	Anthracene		mg/kg	<0.04	520000	<0.04	<0.04	<0.04	<0.04	<0.04	1.06	<0.40	4.85	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	8.03	<0.04	<0.04	0.49	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Fluoranthene		mg/kg	<0.03	23000	0.16	<0.03	0.2	<0.03	<0.03	4.66	1.19	20.41	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.41	39.51	<0.03	0.19	2.56	0.05	<0.03	0.05	0.05	0.09	<0.03	<0.03	0.12	0.08	<0.03
	Pyrene		mg/kg	<0.03	54000	0.13	<0.03	0.16	<0.03	<0.03	4.19	1.01	16.76	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.35	33.31	<0.03	0.17	2.14	0.05	<0.03	0.04	0.05	0.09	<0.03	<0.03	0.1	0.08	<0.03
	Benzo(a)anthracene		mg/kg	<0.06	170	0.11	<0.06	0.12	<0.06	<0.06	2.83	0.87	9.84	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.23	18.17	<0.06	0.14	1.1	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.09	0.08	<0.06
	Chrysene		mg/kg	<0.02	350	0.07	<0.02	0.11	<0.02	<0.02	2.36	0.54	8.68	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.19	17.45	<0.02	0.1	1.17	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.06	0.05	<0.02
	Benzo(bk)fluoranthene		mg/kg	<0.07	-	0.11	<0.07	0.17	<0.07	<0.07	5.18	<0.70	14.65	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.34	34.43	<0.07	0.24	2.13	<0.07	<0.07	<0.07	<0.07	0.1	<0.07	<0.07	0.14	0.1	<0.07
	Benzo(a)pyrene		mg/kg	<0.04	35	0.06	<0.04	0.1	<0.04	<0.04	3.1	<0.40	7.74	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.19	19.38	<0.04	0.12	1.2	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	0.06	<0.04	<0.04
	Indeno(123cd)pyrene		mg/kg	<0.04	500	<0.04	<0.04	0.09	<0.04	<0.04	2.05	<0.40	4.77	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.14	12.53	<0.04	0.09	0.84	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	0.06	<0.04	<0.04
	Dibenzo(ah)anthracene		mg/kg	<0.04	3.5	<0.04	<0.04	<0.04	<0.04	<0.04	0.65	<0.40	1.52	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	2.04	<0.04	<0.04	0.13	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Benzo(ghi)perylene		mg/kg	<0.04	3900	<0.04	<0.04	0.09	<0.04	<0.04	1.82	<0.40	3.86	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.13	10.94	<0.04	0.09	0.77	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	0.06	<0.04	<0.04
	PAH 16 Total		mg/kg	<0.6	-	0.8	<0.6	1.1	<0.6	<0.6	30.7	<6.0	110.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	2.3	220.8	<0.6	1.2	14.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	0.7	<0.6	<0.6
	Benzo(b)fluoranthene		mg/kg	<0.05	44	0.08	<0.05	0.12	<0.05	<0.05	3.73	<0.50	10.55	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24	24.79	<0.05	0.17	1.53	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	0.1	0.07	<0.05
	Benzo(k)fluoranthene		mg/kg	<0.02	1200	0.03	<0.02	0.05	<0.02	<0.02	1.45	<0.20	4.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	9.64	<0.02	0.07	0.6	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.04	0.03	<0.02
TPH CWG Aliphatics	>C5-C6		mg/kg	<0.1	3200	<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	<0.1	<0.1	<0.2	<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
	>C6-C8		mg/kg	<0.1	7800	<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	<0.1	<0.1	<0.2	<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
	>C8-C10		mg/kg	<0.1	2000	<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	<0.1	<0.1	<0.2	<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
	>C10-C12		mg/kg	<0.2	9700	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	>C12-C16		mg/kg	<4	59000	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	>C16-C21		mg/kg	<7	1600000	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	>C21-C35		mg/kg	<7	1600000	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	46	<7	72	115	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	>C35-C44		mg/kg	<7	1600000	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	36	<7	13	97	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Total aliphatics C5-44		mg/kg	<26	-	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	82	<26	85	212	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26
TPH CWG Aromatics	>C5-EC7		mg/kg	<0.1	26000	<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	<0.1	<0.1	<0.2	<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
	>EC7-EC8		mg/kg	<0.1	56000	<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	<0.1	<0.1	<0.2	<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
	>EC8-EC10		mg/kg	<0.1	3500	<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	<0.1	<0.1	<0.2	<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
	>EC10-EC12		mg/kg	<0.2	16000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	>EC12-EC16		mg/kg	<4	36000	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	10	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	>EC16-EC21		mg/kg	<7	28000	<7	<7	<7	<7	<7	13	10	<7	<7	<7	<7	<7	<7	<7	9	9	<7	63	70	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	>EC21-EC35		mg/kg	<7	28000	<7	<7	<7	<7	<7	116	41	<7	<7	<7	<7	<7	<7	<7	80	212	39	426	522	<7	<7	<7	<7	<7	<7	<7	<7	15	13
	>EC35-EC44		mg/kg	<7	28000	<7	<7	<7	<7	<7	49	<7	<7	<7	<7	<7	<7	<7	<7	44	194	32	131	361	<7	<7	<7	<7	<7	<7	<7	<7	23	25
	Total aromatics C5-44		mg/kg	<26	-	<26	<26	<26	<26	<26	178	51	<26	<26	<26	<26	<26	<26	<26	133	415	71	620	964	<26	<26	<26	<26	<26	<26	<26	<26	38	38
	Total aliphatics and aromatics(C5-44)		mg/kg	<52	-	<52	<52	<52	<52	<52	178	<52	<52	<52	<52	<52	<52	<52	<52	133	497	71	705	1176	<52	<52	<52	<52	<52	<52	<52	<52	<52	<52
BTEX	MTBE**		ug/kg	<5	7900	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Benzene		ug/kg	<5	27000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Toluene		ug/kg	<5	56000000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Ethylbenzene		ug/kg	<5	5700000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	m/p-Xylene		ug/kg	<5	5900000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	o-Xylene		ug/kg	<5	6600000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Phenols	Total Phenols HPLC		mg/kg	<0.01	440	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Notes

Chemical Analysis

NAD	No Asbestos Detected
NDP	No Determination Possible
-	Not Tested
*	Commercial C4SL/GC4SL1% SOM Screening Value Used
**	EIC/AGS/CL:AIRE1% SOM Screening Value Used
***	Sweco Acute Criteria Screening value Used

Knoxbridge Farm

Tier 1 Screened Chemical Analysis Results: Leachates. Protective of surface waters.

					Interpretation:	Ground									Bund				
					Sample ID	BH01	BH05	BH07	TP2	TP3	TP4	TP5	TP7	TP8	TP12	TP14	TP16	TP18	TP21
					Depth (m)	0.20	0.50	0.50	0.50	1.00	0.50	0.50	1.50	1.0.	0.80	1.00	1.00	1.30	1.00
					Sample Date	26/02/2019	26/02/2019	27/02/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	07/03/2019
					Date of Receipt	27/02/2019	27/02/2019	01/03/2019	09/03/2019	09/03/2019	08/03/2019	09/03/2019	08/03/2019	08/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019	09/03/2019
Analyte		**Units**	**LOD**	**WFD**	**Source**														
Metals and Inorganics	Dissolved Arsenic	ug/l	<2.5	50	WFD	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	8.7	3.8	<2.5	3.7	<2.5	2.6
	Dissolved Boron	ug/l	<12	-	-	25	21	24	20	13	29	13	48	65	25	21	23	19	21
	Dissolved Cadmium	ug/l	<0.5	0.08	WFD	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Dissolved Chromium	ug/l	<1.5	-	-	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
	Dissolved Copper	ug/l	<7	1	WFD	8	<7	<7	<7	<7	<7	<7	<7	<7	13	12	16	<7	<7
	Dissolved Lead	ug/l	<5	1.2	WFD	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Mercury Dissolved by CVAF	ug/l	<1	0.07	WFD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dissolved Nickel	ug/l	<2	4	WFD	<2	<2	<2	<2	<2	<2	<2	<2	21	<2	<2	2	<2	<2
	Dissolved Selenium	ug/l	<3	-	-	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Vanadium	ug/l	<1.5	20	EQS	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	2.6	8.8	8	9	<1.5	<1.5
	Dissolved Zinc	ug/l	<3	7.9	WFD	4	3	<3	4	<3	4	<3	<3	<3	<3	<3	<3	<3	<3
	Total Dissolved Sulphur	ug/l	<10	-	-	1115	1320	12010	1337	2290	1498	2564	11240	12360	1384	1101	1183	7013	1362
	Sulphate as SO4	mg/l	<0.5	400	EQS	<0.5	4	36.3	3.9	6.3	4.4	8.6	33.6	34.3	<0.5	<0.5	<0.5	22.8	<0.5
	Ammoniacal Nitrogen as N	mg/l	<0.03	0.2	WFD	0.12	0.11	0.77	0.12	0.11	0.12	0.12	0.05	57.5	0.11	0.09	0.09	0.06	0.1
	Free Cyanide	mg/l	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Total Cyanide	mg/l	<0.01	1	WFD	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
	Sulphide	mg/l	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Thiocyanate	mg/l	<0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Hexavalent Chromium	mg/l	<0.006	3.4	WFD	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
	pH	pH units	<0.01	6 to 9	WFD	7.59	6.63	8.18	7.79	7.62	7.75	7.69	8.2	8.67	8.15	8.07	8.07	7.76	8.11
PAH	Naphthalene	ug/l	<0.1	2	WFD	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	ug/l	<0.013	-	-	<0.013	<0.013	0.039	0.032	<0.013	<0.013	<0.013	<0.013	0.073	<0.013	<0.013	<0.013	<0.013	<0.013
	Acenaphthene	ug/l	<0.013	-	-	<0.013	<0.013	0.292	0.016	0.022	0.019	<0.013	0.02	0.636	0.017	0.016	<0.013	<0.013	<0.013
	Fluorene	ug/l	<0.014	-	-	<0.014	<0.014	0.096	0.038	0.025	0.024	<0.014	0.015	0.406	0.02	<0.014	<0.014	<0.014	0.02
	Phenanthrene	ug/l	<0.011	-	-	<0.011	<0.011	0.155	0.064	0.066	0.029	<0.011	0.018	1.019	0.03	0.039	0.017	<0.011	0.019
	Anthracene	ug/l	<0.013	0.1	WFD	<0.013	<0.013	0.044	<0.013	<0.013	<0.013	<0.013	<0.013	0.294	<0.013	<0.013	<0.013	<0.013	<0.013
	Fluoranthene	ug/l	<0.012	0.0063	WFD	<0.012	<0.012	0.197	<0.012	<0.012	<0.012	<0.012	<0.012	1.553	<0.012	<0.012	0.017	<0.012	<0.012
	Pyrene	ug/l	<0.013	-	-	<0.013	<0.013	0.133	<0.013	<0.013	<0.013	<0.013	<0.013	1.312	<0.013	<0.013	0.015	<0.013	<0.013
	Benzo(a)anthracene	ug/l	<0.015	-	-	<0.015	<0.015	0.034	<0.015	<0.015	<0.015	<0.015	<0.015	0.536	<0.015	<0.015	<0.015	<0.015	<0.015
	Chrysene	ug/l	<0.011	-	-	<0.011	<0.011	0.041	<0.011	<0.011	<0.011	<0.011	<0.011	0.58	<0.011	<0.011	0.018	<0.011	<0.011
	Benzo(bk)fluoranthene	ug/l	<0.018	-	-	<0.018	<0.018	0.045	<0.018	<0.018	<0.018	<0.018	<0.018	1.284	<0.018	<0.018	0.034	<0.018	<0.018
	Benzo(a)pyrene	ug/l	<0.016	0.00017	WFD	<0.016	<0.016	0.024	<0.016	<0.016	<0.016	<0.016	<0.016	0.761	<0.016	<0.016	<0.016	<0.016	<0.016
	Indeno(123cd)pyrene	ug/l	<0.011	-	-	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.282	<0.011	<0.011	0.011	<0.011	<0.011
	Dibenzo(ah)anthracene	ug/l	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01
	Benzo(ghi)perylene	ug/l	<0.011	-	-	<0.011	<0.011	0.015	<0.011	<0.011	<0.011	<0.011	<0.011	0.226	<0.011	<0.011	0.019	<0.011	<0.011
	PAH 16 Total	ug/l	<0.195	-	-	<0.195	<0.195	1.115	<0.195	<0.195	<0.195	<0.195	<0.195	9.322	<0.195	<0.195	<0.195	<0.195	<0.195
	Benzo(b)fluoranthene	ug/l	<0.01	-	-	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.92	<0.01	<0.01	0.02	<0.01	<0.01
	Benzo(k)fluoranthene	ug/l	<0.01	-	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.36	<0.01	<0.01	<0.01	<0.01	<0.01
	PAH Surrogate % Recovery	%	<0	-	-	75	73	80	76	73	73	72	78	73	77	72	73	71	76
TPH CWG Aliphatics	>C5-C6	ug/l	<10	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C6-C8	ug/l	<10	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C8-C10	ug/l	<10	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C10-C12	ug/l	<5	-	-	<5	<5	<5	<5	724	<5	<5	<5	<5	<5	<5	<5	<5	<5
	>C12-C16	ug/l	<10	-	-	<10	<10	<10	<10	650	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C16-C21	ug/l	<10	-	-	<10	<10	<10	<10	780	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C21-C35	ug/l	<10	-	-	<10	<10	<10	<10	1520	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C35-C44	ug/l	<10	-	-	<10	<10	<10	<10	50	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total aliphatics C5-44	ug/l	<10	-	-	<10	<10	<10	<10	3724	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH CWG Aromatics	>C5-EC7	ug/l	<10	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC7-EC8	ug/l	<10	74	WFD	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC8-EC10	ug/l	<10	20	WFD	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC10-EC12	ug/l	<5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	>EC12-EC16	ug/l	<10	-	-	<10	<10	<10	<10	160	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC16-EC21	ug/l	<10	-	-	<10	<10	<10	<10	220	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC21-EC35	ug/l	<10	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC35-EC44	ug/l	<10	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total aromatics C5-44	ug/l	<10	-	-	<10	<10	<10	<10	380	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total aliphatics and aromatics(C5-44)	ug/l	<10	-	-	<10	<10	<10	<10	4104	<10	<10	<10	<10	<10	<10	<10	<10	<10
BTEX	MTBE	ug/l	<5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Benzene	ug/l	<5	10	WFD	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Toluene	ug/l	<5	74	WFD	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Ethylbenzene	ug/l	<5	20	WFD	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	m/p-Xylene	ug/l	<5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	o-Xylene	ug/l	<5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Phenols	Total Phenols HPLC	mg/l	<0.05	7.7	WFD	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Based on EQS for freshwaters and lakes in part 3,4,5 and 6 of WFD 2010 and freshwater EQS (2004) where no other criteria are available.

<0.01 Less than limit of detection

>WRD Greater than screening value

*UK Freshwater EQS 2004

Knoxbridge Farm

Tier 1 Screened Chemical Analysis Results: Groundwater. Protective of surface waters.

						Interpretation:	Fridays				
						Sample ID	BH01A	BH01B	BH03	BH04	BH08
						Depth (m)					
						Sample Date	05/03/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019
						Date of Receipt	07/03/2019	07/03/2019	07/03/2019	07/03/2019	07/03/2019
Analyte		**Units**	**LOD**	**WFD**	**Source**						
Metals and Inorganics	Dissolved Arsenic	ug/l	<2.5	50	WFD		5.9	2.7	3.4	30	2.7
	Dissolved Boron	ug/l	<12	-	-		326	438	283	129	775
	Dissolved Cadmium	ug/l	<0.5	0.08	WFD		*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
	Dissolved Calcium	mg/l	<0.2	-	-		529.3	459.3	539.5	69.5	590.3
	TotalDissolved Chromium	ug/l	<1.5	-	-		5.6	3.3	*<1.5*	7.9	4.5
	Dissolved Copper	ug/l	<7	1	WFD		*<7*	*<7*	*<7*	36	*<7*
	Dissolved Lead	ug/l	<5	1.2	WFD		*<5*	*<5*	*<5*	*<5*	*<5*
	Mercury Dissolved by CVAF	ug/l	<1	0.07	WFD		*<1*	*<1*	*<1*	*<1*	*<1*
	Dissolved Nickel	ug/l	<2	4	WFD		3	3	3	4	20
	Dissolved Selenium	ug/l	<3	-	-		*<3*	*<3*	*<3*	12	*<3*
	Vanadium	ug/l	<1.5	20	WFD		1.6	*<1.5*	*<1.5*	19.3	*<1.5*
	Dissolved Zinc	ug/l	<3	7.9	WFD		12	9	14	21	35
	Total Hardness Dissolved (as CaCO3)	mg/l	<1	-	-		2740	2372	2815	252	3193
	Total Dissolved Sulphur as S	ug/l	<10	-	-		544900	538900	933000	86300	1519000
	Sulphate as SO4	mg/l	<0.5	400	WFD		1425	1456.5	2443.4	236.9	4196.2
	Free Cyanide	mg/l	<0.01	-	-		*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Total Cyanide	mg/l	<0.01	1	WFD		*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Ammoniacal Nitrogen as N	mg/l	<0.03	0.2	WFD		0.36	0.43	0.11	0.29	0.33
	Hexavalent Chromium	mg/l	<0.006	3.4	WFD		*<0.006*	*<0.006*	*<0.006*	*<0.006*	*<0.006*
	Sulphide	mg/l	<0.01	-	-		*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Thiocyanate	mg/l	<0.02	-	-		*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
	Dissolved Organic Carbon	mg/l	<2	-	-		*<2*	*<2*	*<2*	25	*<2*
	Electrical Conductivity @25C	uS/cm	<2	-	-		5183	5198	6847	1254	8378
	pH	pH units	<0.01	6 to 9	WFD		7.48	7.53	7.57	7.92	7.45
PAH	Naphthalene	ug/l	<0.1	2	WFD		*<0.1*	*<0.1*	*<0.1*	*<0.1*	3.8
	Acenaphthylene	ug/l	<0.013	-	-		*<0.013*	*<0.013*	*<0.013*	*<0.013*	0.07
	Acenaphthene	ug/l	<0.013	-	-		*<0.013*	*<0.013*	*<0.013*	*<0.013*	0.029
	Fluorene	ug/l	<0.014	-	-		*<0.014*	*<0.014*	*<0.014*	*<0.014*	0.058
	Phenanthrene	ug/l	<0.011	-	-		*<0.011*	*<0.011*	*<0.011*	0.018	0.055
	Anthracene	ug/l	<0.013	0.1	WFD		*<0.013*	*<0.013*	*<0.013*	*<0.013*	*<0.013*
	Fluoranthene	ug/l	<0.012	0.0063	WFD		*<0.012*	*<0.012*	*<0.012*	0.09	0.017
	Pyrene	ug/l	<0.013	-	-		*<0.013*	*<0.013*	*<0.013*	0.084	0.017
	Benzo(a)anthracene	ug/l	<0.015	-	-		*<0.015*	*<0.015*	*<0.015*	0.041	*<0.015*
	Chrysene	ug/l	<0.011	-	-		*<0.011*	*<0.011*	*<0.011*	0.059	*<0.011*
	Benzo(bk)fluoranthene	ug/l	<0.018	-	-		*<0.018*	*<0.018*	*<0.018*	0.118	*<0.018*
	Benzo(a)pyrene	ug/l	<0.016	0.00017	WFD		*<0.016*	*<0.016*	*<0.016*	0.062	*<0.016*
	Indeno(123cd)pyrene	ug/l	<0.011	-	-		*<0.011*	*<0.011*	*<0.011*	0.047	*<0.011*
	Dibenzo(ah)anthracene	ug/l	<0.01	-	-		*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
	Benzo(ghi)perylene	ug/l	<0.011	-	-		*<0.011*	*<0.011*	*<0.011*	0.064	*<0.011*
	PAH 16 Total	ug/l	<0.195	-	-		*<0.195*	*<0.195*	*<0.195*	0.583	4.046
	Benzo(b)fluoranthene	ug/l	<0.01	-	-		*<0.01*	*<0.01*	*<0.01*	0.08	*<0.01*
	Benzo(k)fluoranthene	ug/l	<0.01	-	-		*<0.01*	*<0.01*	*<0.01*	0.03	*<0.01*
	PAH Surrogate % Recovery	%	<0	-	-		82	80	86	82	80
TPH CWG Aliphatics	>C5-C6	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>C6-C8	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>C8-C10	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>C10-C12	ug/l	<5	-	-		*<5*	*<5*	*<5*	*<5*	*<5*
	>C12-C16	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>C16-C21	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>C21-C35	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>C35-C44	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	Total aliphatics C5-44	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
TPH CWG Aromatics	>C5-EC7	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>EC7-EC8	ug/l	<10	74	WFD		*<10*	*<10*	*<10*	*<10*	*<10*
	>EC8-EC10	ug/l	<10	20	WFD		*<10*	*<10*	*<10*	*<10*	*<10*
	>EC10-EC12	ug/l	<5	-	-		*<5*	*<5*	*<5*	*<5*	*<5*
	>EC12-EC16	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>EC16-EC21	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>EC21-EC35	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	>EC35-EC44	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	Total aromatics C5-44	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
	Total aliphatics and aromatics(C5-44)	ug/l	<10	-	-		*<10*	*<10*	*<10*	*<10*	*<10*
BTEX	MTBE	ug/l	<5	-	-		*<5*	*<5*	*<5*	*<5*	*<5*
	Benzene	ug/l	<5	10	WFD		*<5*	*<5*	*<5*	*<5*	*<5*
	Toluene	ug/l	<5	74	WFD		*<5*	*<5*	*<5*	*<5*	*<5*
	Ethylbenzene	ug/l	<5	20	WFD		*<5*	*<5*	*<5*	*<5*	*<5*
	m/p-Xylene	ug/l	<5	-	-		*<5*	*<5*	*<5*	*<5*	*<5*
	o-Xylene	ug/l	<5	-	-		*<5*	*<5*	*<5*	*<5*	*<5*
Phenols	Total Phenols HPLC	mg/l	<0.05	7.7	WFD		*<0.15*	*<0.15*	*<0.15*	*<0.15*	*<0.15*

Based on EQS for freshwaters and lakes in part 3,4,5 and 6 of WFD 2010 and freshwater EQS (2004) where no other criteria are available.

<0.01 Less than limit of detection

>WFD Greater than screening value

Appendix G – Screened Gas and Groundwater Monitoring Data

GROUND GAS ASSESSMENT
Knoxbridge Farm Phase 1 Site Investigation

NOTES:
Assessment based on guidance published in CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings.'

Information from Table 8.5 of CIRIA C665

Characteristic Situation 1 conditions
Gas screening value (CH4 or CO2) < 0.07 l/h
Typically methane < 1 % by volume
Typically carbon dioxide < 5% by volume
Characteristic Situation 2 conditions
Gas screening value (CH4 or CO2) < 0.7 l/h
Borehole air flow rate < 70 l/h
Characteristic Situation 3 conditions
Gas screening value (CH4 or CO2) < 3.5 l/h

CO_2 > 5% in air
CH4 > 1 % in air
GSV > or = 0.07 l/h
GSV> or = 0.7 l/h

			Groundwater Level Measurements			Gas measurements							CO_2 analysis		CH_4 analysis		
Exploratory Hole	**Response zone stratum**	**Date Monitored**	**Groundwater Level (mbgl)**	**Base Level (mbgl)**	**Depth of Water (m)**	**Flow Rate (l/hr)**	**Atmos Pres (mb)**	**Min O2 (%) air**	**Max CO2 (% air)**	**Max CH4 (% air)**	**Max CO (ppm)**	**Max H_2S (ppm)**	**CO2 as fraction**	**Gas screening value CO_2 (l/hr)**	**CH_4 as fraction**	**Gas screening value CH_4 (l/hr)**	**Characteristic Situation**
Round 1 - 11/03/2019																	
BH01	**Made Ground and natural**	11/03/2019		7.95	1.65	-0.1	1019	21.1	0.4	0.1			0.004	0.000	0.001	0.000	1
BH03	**Made Ground and natural**	11/03/2019		5.28	0.45	-0.2	1019	21.5	0.3	0.1			0.003	0.000	0.001	0.000	1
BH04	**Made Ground and natural**	11/03/2019		4.59	0.25	0.1	1019	21.5	0.1	0.1			0.001	0.000	0.001	0.000	1
BH08	**Made Ground and natural**	11/03/2019		5	1.3	-23.2	1019	20.8	0.5	0.1			0.005	0.001	0.001	0.000	1
Round 2 - 18/03/2019																	
BH01	**Made Ground and natural**	18/03/2019		7.97	1.59	0	1016	21.4	0.2	0.0			0.002	0.000	0.000	0.000	1
BH03	**Made Ground and natural**	18/03/2019		5.3	1.45	0.1	1016	21.1	0.4	0.0			0.004	0.000	0.000	0.000	1
BH04	**Made Ground and natural**	18/03/2019		4.6	0.32	0	1016	21.3	0.1	0.0			0.001	0.000	0.000	0.000	1
BH08	**Made Ground and natural**	18/03/2019		5.02	1.31	-21.9	1016	20.7	0.4	0.1			0.004	0.000	0.001	0.000	1
Round 3 - 25/03/2019																	
BH01	**Made Ground and natural**	25/03/2019		7.98	1.61	-17.8	1025	21.7	0.4	0.1			0.004	0.000	0.001	0.000	1
BH03	**Made Ground and natural**	25/03/2019		5.25	1.41	-0.2	1025	21.2	0.8	0.0			0.008	0.001	0.000	0.000	1
BH04	**Made Ground and natural**	25/03/2019		4.57	1.12	0	1025	20	0.8	0.0			0.008	0.001	0.000	0.000	1
BH08	**Made Ground and natural**	25/03/2019		5.02	1.38	-20.6	1025	20.2	0.6	0.0			0.006	0.001	0.000	0.000	1
						(MAX)		(MIN)	(MAX)	(MAX)	(MAX)	(MAX)					
WORST CASE CALCULATION ALL DATA						**0.10**		**20.00**	**0.80**	**0.10**	**0.00**	**0.00**	**0.008**	**0.001**	**0.001**	**0.000**	**1**

Appendix H – Draft Factual Ground Investigation Data, Central Alliance, 2019

CENTRAL ALLIANCE
EXPLORE > IDENTIFY > DELIVER

Alliance House, South Park Way
Wakefield 41 Business Park
Wakefield WF2 0XJ
Tel: +44 (0)1924 229889
Web: www.central-alliance.co.uk

Log Type	Exploratory Hole Number
Header Sheet	**BH01** PRELIM

CENTRAL ALLIANCE GEO

		Location Details				Methodology & Plant				
Project No:	**4246**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Scale:	1:50
Name:	**Fridays AD Plant**	Elevation:	**N/A**	Final Depth:	**11.76m**	0.00 - 1.20 1.20 - 11.76	Inspection Pit Cable Percussion	Hand Tools Dando 2000	Checked:	
Location:	**Kent**	Logger:	**TW**	Grid System:	**OSGB**				Approved:	
Client:	**Sweco**	Orientation:	**N/A**	Inclination:	**90°**				Start Date:	26/02/2019
									End Date:	26/02/2019

Hole Diameter

Depth (m)	Diam (mm)
11.76	150

Casing Diameter

Depth (m)	Diam (mm)
1.50	200

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
3.00	-	1.50	20	2.90	
11.00	-	1.50	20	3.90	

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)
26/02/2019	Standpipe	8.00	8.00 - 11.70	

If Methodology includes Dynamic Sampling refer to Runs table for info.

Backfill

Depth (m)	Legend Code
0.00 - 1.00	Bentonite
1.00 - 8.00	Gravel
8.00 - 11.76	Bentonite

In-Situ Tests

PID	0
Hand Vane*	5
Standard Penetration Tests	5

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	4	Water	0
Geotechnical Samples			
Bulk	2	Large Bulk	0
Disturbed	18	Disturbed (NR)	0
Piston	0	Piston (NR)	0
Undisturbed	0	Undisturbed (NR)	0
Undisturbed Thin Wall			3
Undisturbed Thin Wall (NR)			1
Core Sample			0

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Split Spoon	1.20	-	-	4	12	450	12	N=12 (2,2/3,3,3,3)	AR1324
Split Spoon	3.50	-	-	4	22	450	22	N=22 (2,2/4,5,6,7)	AR1324
Split Spoon	6.00	-	-	10	43	450	43	N=43 (5,5/10,10,11,12)	AR1324
Split Spoon	9.00	-	-	14	43	450	43	N=43 (5,9/10,11,11,11)	AR1324
Split Spoon	11.50	-	-	25	50	255		50 (10,15/50 for 105mm)	AR1324

SPT Hammer Ref.	Energy Ratio (%)
AR1324	57

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)
6.50 - 6.70	30
7.80 - 8.00	30
11.20 - 11.50	60

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

CENTRAL ALLIANCE
EXPLORE > IDENTIFY > DELIVER

Alliance House, South Park Way
Wakefield 41 Business Park
Wakefield WF2 0XJ
Tel +44(0)1924 229889
Web: www.central-alliance.co.uk

Log Type: **Cable Percussion**

Sheet 1 of 2

Exploratory Hole Number: **BH01**

PRELIM

CENTRAL ALLIANCE GEO

		Location Details:				Methodology & Plant				
Project No:	**4246**	Easting:	**N/A**	Northing:	**N/A**	Depth (m)	Method	Plant Used	Scale:	1:50
Name:	**Fridays AD Plant**	Elevation:	**N/A**	Final Depth:	**11.76m**	0.00 - 1.20	Inspection Pit	Hand Tools	Checked By:	
Location:	**Kent**	Logged By:	**TW**	Grid System:	**OSGB**	1.20 - 11.76	Cable Percussion	Dando 2000	Approved By:	
Client:	**Sweco**	Orientation:	**N/A**	Inclination:	**90°**				Start Date:	26/02/2019
									Finish Date:	26/02/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Firm dark brown gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse flint, brick and sandstone. Sand is fine to coarse.		(0.25) 0.25								0.20 0.20	D ES	
MADE GROUND: Firm to stiff Light brown mottled grey slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to medium flint, clinker and sandstone. Sand is fine to coarse.										0.50 0.50	D ES	HV 0.50m, (p)=184 kPa (r)=24 kPa
										0.80	D	
		(1.35)								1.00 1.00 1.00 - 1.20 1.20 - 1.65	D ES B D	SPT(S) 1.20m, N=12 (2,2/3,3,3,3) HV 1.30m, (p)=220 kPa (r)=32 kPa
From 1.20m to 1.60m with no flint.							200 1.50					
Firm to stiff greyish brown sandy silty CLAY with orange and black staining throughout. Sand is fine to coarse.		1.60								1.70	ES	
										2.00	D	
										2.50 - 2.95	UT	25 blows, 75% Recovery
		(2.70)						2.90 3.00		3.00	D	HV 2.90m, (p)=204 kPa (r)=28 kPa HV 3.00m, (p)=228 kPa (r)=44 kPa
										3.50 - 3.95	D	SPT(S) 3.50m, N=22 (2,2/4,5,6,7)
								3.90		4.00	D	HV 4.00m, (p)=136 kPa (r)=44 kPa
Weathered MUDSTONE recovered as stiff to very stiff light grey slightly sandy slightly silty friable CLAY. Sand is fine.		4.30								4.30	D	
										4.50 - 4.95	UT	60 blows, 100% Recovery
										5.00	D	
				30						6.00 - 6.45	D	SPT(S) 6.00m, N=43 (5,5/10,10,11,12)
										7.00	D	
		(6.70)								7.50 - 7.95 7.50 - 7.95	B UT-NR	100 blows, 0% Recovery
				30						8.00	D	
										9.00 - 9.45	D	SPT(S) 9.00m, N=43 (5,9/10,11,11,11)
Continued on Next Page										10.00	D	

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
Monitoring Point/s Installed
Hammer Ref & Energy Ratio (%)
AR1324 (57)(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	1.00	Bentonite
1.00	8.00	Gravel
8.00	11.76	Bentonite

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.
Standpipe	8.00 - 11.70	8.00	

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks
3.00	2.90	20	
11.00	3.90	20	

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Log Type: **Cable Percussion**

Sheet 2 of 2

Exploratory Hole Number: **BH01**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	26/02/2019
		Finish Date:	26/02/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**11.76m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
Weathered MUDSTONE recovered as stiff to very stiff light grey slightly sandy slightly silty friable CLAY. Sand is fine.										10.50 - 10.95	UT	100 blows, 25% Recovery
								11.00				
Grey MUDSTONE.		11.00								11.00	D	
		(0.76)		60								
						150				11.50 - 11.76	D	SPT(S) 11.50m, 50 (10,15/50 for 105mm)
EOH at 11.76m - Refusal		11.76				11.76						

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
Monitoring Point/s Installed
Hammer Ref & Energy Ratio (%)
AR1324 (57%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.
Standpipe	8.00 - 11.70	8.00	

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks

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Log Type	Exploratory Hole Number
Header Sheet	**BH04** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**10.00m**	0.00 - 1.20 1.20 - 10.00	Inspection Pit Cable Percussion	Hand Tools Dando 2000	Approved:	
Client:	**Sweco**	Logger:	**TW**	Grid System:	**OSGB**				Start Date:	27/02/2019
		Orientation:	**N/A**	Inclination:	**90°**				End Date:	27/02/2019

Hole Diameter

Depth (m)	Diam (mm)
10.00	150

Casing Diameter

Depth (m)	Diam (mm)
1.50	150

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
3.70	-	1.50	20	3.50	

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)
27/02/2019	Standpipe	5.00	5.00 - 10.00	

If Methodology includes Dynamic Sampling refer to Runs table for info.

Backfill

Depth (m)	Legend Code
0.00 - 1.00	Bentonite
1.00 - 5.00	Gravel
5.00 - 10.00	Bentonite

In-Situ Tests

PID	0
Hand Vane*	6
Standard Penetration Tests	5

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	2	Water	0
Geotechnical Samples			
Bulk	3	Large Bulk	0
Disturbed	16	Disturbed (NR)	0
Piston	0	Piston (NR)	0
Undisturbed	0	Undisturbed (NR)	0
Undisturbed Thin Wall			1
Undisturbed Thin Wall (NR)			1
Core Sample			0

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Split Spoon	1.40	-	-	5	16	450	16	N=16 (2,3/3,4,4,5)	AR1324
Split Spoon	2.50	-	-	4	33	450	33	N=33 (2,2/4,4,5,20)	AR1324
Split Spoon	3.50	-	-	6	27	450	27	N=27 (2,4/6,6,6,9)	AR1324
Split Spoon	6.00	-	-	11	39	450	39	N=39 (5,6/8,9,10,12)	AR1324
Split Spoon	9.55	-	-	10	47	450	47	N=47 (5,5/8,11,13,15)	AR1324

SPT Hammer Ref.	Energy Ratio (%)
AR1324	57

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**
Sheet 1 of 1

Exploratory Hole Number: **BH04**
PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	27/02/2019
		Finish Date:	27/02/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**10.00m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used
0.00 - 1.20	Inspection Pit	Hand Tools
1.20 - 10.00	Cable Percussion	Dando 2000

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Dark brown clayey very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse brick, flint, chalk and sandstone.		(0.20) 0.20								0.20	D	
MADE GROUND: Dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of various lithologies.		(0.60) 0.80								0.50 0.80	D D	 HV 0.80m, (p)=152 kPa (r)=28 kPa
MADE GROUND: Greyish blue mottled orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded of various lithologies. Sand is fine to coarse. *From 0.80m becomes slightly sandy.*		(0.70) 1.50					150 1.50			1.00 1.20 1.40 1.40 - 1.85	B D ES D	 SPT(S) 1.40m, N=16 (2,3/3,4,4,5)
Stiff light brown mottled bluish grey slightly sandy slightly silty CLAY. Sand is fine to coarse.		(1.20) 2.70								2.00 2.00 2.50 - 2.95	D ES D	 SPT(S) 2.50m, N=33 (2,2/4,4,5,20) HV 2.70m, (p)=196 kPa (r)=50 kPa
Very stiff dark greyish brown slightly sandy CLAY. Sand is fine to coarse.		(1.30) 4.00						3.50 3.70		3.00 3.50 - 3.95	D D	 SPT(S) 3.50m, N=27 (2,4/6,6,6,9)
Firm to stiff greenish grey mottled orange silty CLAY.		(2.00) 6.00								4.00 4.50 - 4.95 5.00 5.20	D UT D B	 70 blows, 100% Recovery HV 4.50m, (p)=188 kPa (r)=36 kPa HV 5.50m, (p)=188 kPa (r)=40 kPa
Stiff bluish grey slightly silty CLAY with silt partings.		(4.00) 10.00				150 10.00				6.00 - 6.45 7.00 7.50 - 7.70 7.50 - 7.70 8.00 9.00 9.55 - 10.00	D D B UT-NR D D D	SPT(S) 6.00m, N=39 (5,6/8,9,10,12) HV 6.00m, (p)= kPa (r)= kPa Failed - too friable HV 7.00m, (p)= kPa (r)= kPa Failed - too friable 100 blows, 0% Recovery SPT(S) 9.55m, N=47 (5,5/8,11,13,15)
EOH at 10.00m - Scheduled Depth		10.00										

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
Monitoring Point/s Installed
Hammer Ref & Energy Ratio (%)
AR1324 (57)(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	1.00	Bentonite
1.00	5.00	Gravel
5.00	10.00	Bentonite

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.
Standpipe	5.00 - 10.00	5.00	

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks
3.70	3.50	20	

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Log Type	Exploratory Hole Number
Header Sheet	**BH05** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**10.00m**	0.00 - 1.20 1.20 - 10.00	Inspection Pit Cable Percussion	Hand Tools Dando 2000	Approved:	
Client:	**Sweco**	Logger:	**TW**	Grid System:	**OSGB**				Start Date:	25/02/2019
		Orientation:	**N/A**	Inclination:	**90°**				End Date:	25/02/2019

Hole Diameter

Depth (m)	Diam (mm)
10.00	150

Casing Diameter

Depth (m)	Diam (mm)
1.50	150

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
2.90	-	1.50	20	2.80	

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)

If Methodology includes Dynamic Sampling refer to Runs table for info.

No Monitoring Point/s Installed

Backfill

Depth (m)	Legend Code
0.00 - 10.00	Grout

Sample Summary

Environmental Samples			
Soil	**5**	Water	**0**
Geotechnical Samples			
Bulk	**2**	Large Bulk	**0**
Disturbed	**18**	Disturbed (NR)	**0**
Piston	**0**	Piston (NR)	**0**
Undisturbed	**0**	Undisturbed (NR)	**0**
Undisturbed Thin Wall			**3**
Undisturbed Thin Wall (NR)			**0**
Core Sample			**0**

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Split Spoon	1.40	-	-	5	15	450	15	N=15 (2,3/3,4,4,4)	AR1324
Split Spoon	3.50	-	-	6	20	450	20	N=20 (2,4/4,4,6,6)	AR1324
Split Spoon	6.00	-	-	7	23	450	23	N=23 (3,4/5,5,5,8)	AR1324
Split Spoon	9.55	-	-	14	46	450	46	N=46 (5,9/10,12,12,12)	AR1324

SPT Hammer Ref.	Energy Ratio (%)
AR1324	57

In-Situ Tests

PID	**0**
Hand Vane*	**5**
Standard Penetration Tests	**4**

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**
Sheet 1 of 1

Exploratory Hole Number: **BH05**
PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details:		Methodology & Plant	Scale: 1:50
Name:	**Fridays AD Plant**	Easting: **N/A**	Northing: **N/A**	Depth (m): 0.00 - 1.20, 1.20 - 10.00 / Method: Inspection Pit, Cable Percussion / Plant Used: Hand Tools, Dando 2000	Checked By:
Location:	**Kent**	Elevation: **N/A**	Final Depth: **10.00m**		Approved By:
Client:	**Sweco**	Logged By: **TW**	Grid System: **OSGB**		Start Date: 25/02/2019
		Orientation: **N/A**	Inclination: **90°**		Finish Date: 25/02/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Light brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse coal, flint and sandstone. Sand is fine to coarse.		(1.20)								0.20 0.20 0.50 0.50 0.80 1.00 1.00 - 1.20 1.20	D ES D ES D ES B D	
Stiff light brown mottled light grey slightly sandy slightly silty CLAY. Sand is fine to coarse.		1.20 (0.60)					150 1.50			1.40 - 1.85 1.50	D ES	SPT(S) 1.40m, N=15 (2,3/3,4,4,4) HV 1.50m, (p)=236 kPa (r)=40 kPa
Firm to stiff greyish brown sandy silty CLAY with orange and black staining throughout. Sand is fine to coarse.		1.80 (1.20)								2.00 2.00 2.50 - 2.90	D ES UT	HV 2.00m, (p)=192 kPa (r)=36 kPa 100 blows, 75% Recovery
								2.80		2.85	D	
Stiff light grey mottled black slightly silty CLAY.		3.00 (1.00)						2.90				HV 3.00m, (p)=204 kPa (r)=36 kPa
										3.50 - 3.95	D	SPT(S) 3.50m, N=20 (2,4/4,4,6,6)
Stiff light brown mottled light grey slightly sandy slightly silty CLAY. Sand is fine to coarse. *At 4.10m with red mottling.*		4.00 (0.50)								4.00 4.10 - 4.40	D B	HV 4.00m, (p)=190 kPa (r)=42 kPa
Stiff dark grey slightly silty CLAY. *From 5.00m with silty laminations.*		4.50 (5.50)								4.50 4.50 - 4.95 5.00 5.10 6.00 - 6.45 7.00 8.00 8.00 - 8.45 8.50 9.00 9.55 - 10.00	D UT D D D D D UT D D D	70 blows, 80% Recovery HV 4.50m, (p)= kPa (r)= kPa Failed - too friable SPT(S) 6.00m, N=23 (3,4/5,5,5,8) 70 blows, 100% Recovery SPT(S) 9.55m, N=46 (5,9/10,12,12,12)
EOH at 10.00m - Scheduled Depth		10.00				150 10.00						

Observations / Remarks

Misc.
Groundwater Encountered
Casing Used
No Monitoring Point Installed
Hammer Ref & Energy Ratio (%)
AR1324 (57)(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	10.00	Grout

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks
2.90	2.80	20	

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Log Type	Exploratory Hole Number
Header Sheet	**BH06** PRELIM

CENTRAL ALLIANCE GEO

		Location Details				Methodology & Plant				
Project No:	**4246**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Scale:	1:50
Name:	**Fridays AD Plant**	Elevation:	**N/A**	Final Depth:	**0.85m**	0.00 - 0.40	Inspection Pit	Hand Tools	Checked:	
Location:	**Kent**	Logger:	**TW**	Grid System:	**OSGB**	0.00 - 0.85	Inspection Pit	Hand Tools	Approved:	
Client:	**Sweco**	Orientation:	**N/A**	Inclination:	**90°**				Start Date:	25/02/2019
									End Date:	25/02/2019

Hole Diameter

Depth (m)	Diam (mm)

Casing Diameter

Depth (m)	Diam (mm)

Hole Not Cased

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

No Groundwater Encountered

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)

No Monitoring Point/s Installed

If Methodology includes Dynamic Sampling refer to Runs table for info.

Backfill

Depth (m)	Legend Code
0.00 - 0.85	Arisings

In-Situ Tests

PID	0
Hand Vane*	0
Standard Penetration Tests	0

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	2	Water	0
Geotechnical Samples			
Bulk	0	Large Bulk	0
Disturbed	3	Disturbed (NR)	0
Piston	0	Piston (NR)	0
Undisturbed	0	Undisturbed (NR)	0
Undisturbed Thin Wall			0
Undisturbed Thin Wall (NR)			0
Core Sample			0

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref

SPT Hammer Ref.	Energy Ratio (%)

No Standard Penetration Tests Undertaken

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**

Sheet 1 of 1

Exploratory Hole Number: **BH06**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	25/02/2019
		Finish Date:	25/02/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**0.85m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used
0.00 - 0.40	Inspection Pit	Hand Tools
0.00 - 0.85	Inspection Pit	Hand Tools

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Yellowish brown gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint, sandstone and rare brick. Sand is fine to coarse.		(0.30)								0.20	ES	
		0.30								0.30	D	
MADE GROUND: Greyish brown slightly gravelly sandy slightly organic CLAY. Gravel is angular to subrounded fine to coarse flint and rare brick. Sand is fine to coarse.		(0.55)								0.50	ES	
										0.60	D	
		0.85								0.80	D	
EOH at 0.85m - Abandoned due to metal obstruction												

Observations / Remarks

Misc.

No Groundwater Encountered
Hole Not Cased
No Monitoring Point Installed
Hammer Ref & Energy Ratio (%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	0.85	Arisings

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks

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Log Type	Exploratory Hole Number
Header Sheet	**BH06A** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**0.40m**				Approved:	
Client:	**Sweco**	Logger:		Grid System:	**OSGB**				Start Date:	25/02/2019
		Orientation:	**N/A**	Inclination:	**90°**				End Date:	25/02/2019

Hole Diameter

Depth (m)	Diam (mm)

Casing Diameter

Depth (m)	Diam (mm)

Hole Not Cased

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

No Groundwater Encountered

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)

No Monitoring Point/s Installed

If Methodology includes Dynamic Sampling refer to Runs table for info.

Backfill

Depth (m)	Legend Code
0.00 - 0.40	Arisings

In-Situ Tests

PID	0
Hand Vane*	0
Standard Penetration Tests	0

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	0	Water	0
Geotechnical Samples			
Bulk	0	Large Bulk	0
Disturbed	0	Disturbed (NR)	0
Piston	0	Piston (NR)	0
Undisturbed	0	Undisturbed (NR)	0
Undisturbed Thin Wall			0
Undisturbed Thin Wall (NR)			0
Core Sample			0

(NR) Indicates sample undertaken but with 0% Recovery

No Samples Taken

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref

SPT Hammer Ref.	Energy Ratio (%)

No Standard Penetration Tests Undertaken

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**

Sheet 1 of 1

Exploratory Hole Number: **BH06A**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	25/02/2019
		Finish Date:	25/02/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**0.40m**
Logged By:		Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Yellowish brown gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint, sandstone and rare brick. Sand is fine to coarse.		(0.30) 0.30										
MADE GROUND: Greyish brown slightly gravelly sandy slightly organic CLAY. Gravel is angular to subrounded fine to coarse flint and rare brick. Sand is fine to coarse.		(0.10) 0.40										
EOH at 0.40m - Abandoned due to metal obstruction												

Observations / Remarks

Misc.

No Groundwater Encountered
Hole Not Cased
No Monitoring Point Installed
Hammer Ref & Energy Ratio (%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	0.40	Arisings

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks

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Log Type	Exploratory Hole Number
Header Sheet	**BH07** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**10.00m**	0.00 - 1.35 1.35 - 10.00	Inspection Pit Cable Percussion	Hand Tools Dando 2000	Approved:	
Client:	**Sweco**	Logger:	**TW**	Grid System:	**OSGB**				Start Date:	27/02/2019
		Orientation:	**N/A**	Inclination:	**90°**				End Date:	27/02/2019

Hole Diameter

Depth (m)	Diam (mm)
10.00	150

Casing Diameter

Depth (m)	Diam (mm)
1.50	150

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)

If Methodology includes Dynamic Sampling refer to Runs table for info.

No Groundwater Encountered

No Monitoring Point/s Installed

Backfill

Depth (m)	Legend Code
0.00 - 10.00	Grout

In-Situ Tests

PID	0
Hand Vane*	2
Standard Penetration Tests	5

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	4	Water	0
Geotechnical Samples			
Bulk	3	Large Bulk	0
Disturbed	17	Disturbed (NR)	0
Piston	0	Piston (NR)	0
Undisturbed	0	Undisturbed (NR)	0
Undisturbed Thin Wall			1
Undisturbed Thin Wall (NR)			1
Core Sample			0

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Split Spoon	1.20	-	-	2	13	450	13	N=13 (1,1/2,2,3,6)	AR1324
Split Spoon	2.50	-	-	4	17	450	17	N=17 (2,2/3,4,5,5)	AR1324
Split Spoon	4.50	-	-	10	40	450	40	N=40 (5,5/10,10,10,10)	AR1324
Split Spoon	7.50	-	-	14	50	265		50 (5,9/50 for 115mm)	AR1324
Split Spoon	9.55	-	-	17	50	380		N=50 (5,12/50 for 230mm)	AR1324

SPT Hammer Ref.	Energy Ratio (%)
AR1324	57

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**
Sheet 1 of 1

Exploratory Hole Number: **BH07**
PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	27/02/2019
		Finish Date:	27/02/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**10.00m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used
0.00 - 1.35	Inspection Pit	Hand Tools
1.35 - 10.00	Cable Percussion	Dando 2000

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Bluish grey mottled light brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse of various lithologies. Sand is fine to coarse.		(0.30) 0.30								0.20	D	
										0.20	ES	
MADE GROUND: Dark brown mottled orange slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to medium of various lithologies. Sand is fine to coarse.										0.50	D	
										0.50	ES	
										0.80	D	
		(1.20)								1.00	B	
										1.00	ES	
										1.20 - 1.65	D	SPT(S) 1.20m, N=13 (1,1/2,2,3,6)
		1.50					150 1.50					
Stiff bluish grey mottled light brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to medium of various lithologies. Sand is fine to coarse.												HV 1.60m, (p)=208 kPa (r)=52 kPa
										2.00	D	
		(1.50)								2.00	ES	
										2.50 - 2.95	D	SPT(S) 2.50m, N=17 (2,2/3,4,5,5) HV 2.50m, (p)=200 kPa (r)=48 kPa
		3.00								3.00	D	
Stiff to very stiff bluish grey mottled light brown slightly silty CLAY.												
From 3.50m becomes sandy. Sand is fine to coarse.										3.50 - 3.70	B	100 blows, 0% Recovery
										3.50 - 3.70	UT-NR	
										4.00	D	
										4.50 - 4.95	D	SPT(S) 4.50m, N=40 (5,5/10,10,10,10)
From 5.00m becomes weathered mudstone.										5.00	D	
										5.50	B	
From 5.60m becomes bluish grey with no mottling.										6.00	D	60 blows, 100% Recovery
										6.00 - 6.45	UT	
		(7.00)								6.50	D	
										7.00	D	
										7.50 - 7.95	D	SPT(S) 7.50m, 50 (5,9/50 for 115mm)
										8.00	D	
										9.00	D	
										9.55 - 10.00	D	SPT(S) 9.55m, N=50 (5,12/50 for 230mm)
EOH at 10.00m - Scheduled Depth		10.00				150 10.00						

Observations / Remarks

Misc.

No Groundwater Encountered
Casing Used
No Monitoring Point Installed
Hammer Ref & Energy Ratio (%)
AR1324 (57)(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	10.00	Grout

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks

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Log Type	Exploratory Hole Number
Header Sheet	**BH02** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**10.00m**	0.00 - 1.20	Inspection Pit	Hand Tools	Approved:	
Client:	**Sweco**	Logger:	**TW**	Grid System:	**OSGB**	1.20 - 10.00	Cable Percussion Boring	Dando 2000	Start Date:	01/03/2019
		Orientation:		Inclination:					End Date:	01/03/2019

Hole Diameter

Depth (m)	Diam (mm)
10.00	150

Casing Diameter

Depth (m)	Diam (mm)
1.50	150

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
4.50	-	-	20	4.30	

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)

If Methodology includes Dynamic Sampling refer to Runs table for info.

No Monitoring Point/s Installed

Backfill

Depth (m)	Legend Code
0.00 - 10.00	Grout

In-Situ Tests

PID	0
Hand Vane*	1
Standard Penetration Tests	6

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	2	Water	0
Geotechnical Samples			
Bulk	2	Large Bulk	0
Disturbed	18	Disturbed (NR)	0
Piston	0	Piston (NR)	0
Undisturbed	0	Undisturbed (NR)	0
Undisturbed Thin Wall			0
Undisturbed Thin Wall (NR)			1
Core Sample			0

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Split Spoon	1.20	-	-	2	10	450	10	N=10 (1,1/2,2,2,4)	AR1324
Split Spoon	2.50	-	-	5	20	450	20	N=20 (2,3/4,5,5,6)	AR1324
Split Spoon	4.50	-	-	6	21	450	21	N=21 (2,4/5,5,5,6)	AR1324
Split Spoon	6.00	-	-	13	38	450	38	N=38 (6,7/8,9,10,11)	AR1324
Split Spoon	7.00	-	-	14	50	425		N=50 (5,9/50 for 275mm)	AR1324
Split Spoon	9.55	-	-	15	49	450	49	N=49 (6,9/9,13,13,14)	AR1324

SPT Hammer Ref.	Energy Ratio (%)
AR1324	57

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)
3.70 - 3.90	30
7.40 - 7.60	30

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**

Sheet 1 of 1

Exploratory Hole Number: **BH02**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	01/03/2019
		Finish Date:	01/03/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**10.00m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:		Inclination:	

Methodology & Plant

Depth (m)	Method	Plant Used
0.00 - 1.20	Inspection Pit	Hand Tools
1.20 - 10.00	Cable Percussion Boring	Dando 2000

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Dark brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse brick, flint, sandstone and clinker. Sand is fine to coarse.		(0.60)								0.20	1 D	
										0.50	2 D	
Possible MADE GROUND: Orangish brown mottled bluish grey sandy silty CLAY. Sand is fine to coarse.		0.60								0.80	3 D	
		(0.90)								1.00	4 B	
										1.20 1.20 - 1.65	5 D 6 D	SPT(S) 1.20m, N=10 (1,1/2,2,2,4)
		1.50					150 1.50			1.50	22 ES	
Bluish grey mottled light brown slightly sandy silty CLAY. Sand is fine to coarse.		(0.50)										HV 1.80m, (p)=188 kPa (r)=44 kPa
Stiff light brown sandy silty CLAY with iron staining. Sand is fine to coarse.		2.00								2.00 2.00	23 ES 7 D	
										2.50 - 2.95	8 D	SPT(S) 2.50m, N=20 (2,3/4,5,5,6)
From 3.00m no sand.										3.00	9 D	
		(3.00)								3.50 - 3.95	10 UT-NR	100 blows, 0% Recovery
				30								
From 4.00m with bluish grey mottling.										4.00	11 D	
								4.30 4.50		4.50 - 4.95	12 D	SPT(S) 4.50m, N=21 (2,4/5,5,5,6)
Stiff to very stiff bluish grey slightly silty CLAY.		5.00								5.00 5.20	13 D 14 B	
										6.00 6.00 - 6.45	15 D 16 D	SPT(S) 6.00m, N=38 (6,7/8,9,10,11)
										7.00 7.00 - 7.45	17 D 18 D	SPT(S) 7.00m, N=50 (5,9/50 for 275mm)
		(5.00)		30								
										8.00	19 D	
										9.00	20 D	
										9.55 - 10.00	21 D	SPT(S) 9.55m, N=49 (6,9/9,13,13,14)
EOH at 10.00m - Scheduled Depth		10.00				150 10.00						

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
No Monitoring Point Installed
Hammer Ref & Energy Ratio (%)
AR1324 (57)(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	10.00	Grout

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks
4.50	4.30	20	

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Log Type	Exploratory Hole Number
Header Sheet	**BH03** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**10.00m**	0.00 - 1.20 1.20 - 10.00	Inspection Pit Cable Percussion	Hand Tools Dando 2000	Approved:	
Client:	**Sweco**	Logger:	**TW**	Grid System:	**OSGB**				Start Date:	28/02/2019
		Orientation:	**N/A**	Inclination:	**90°**				End Date:	28/02/2019

Hole Diameter

Depth (m)	Diam (mm)

Casing Diameter

Depth (m)	Diam (mm)
1.50	150

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
8.00	-	-	20	7.70	

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)
28/02/2019		5.00	1.00 - 5.00	

If Methodology includes Dynamic Sampling refer to Runs table for info.

Backfill

Depth (m)	Legend Code
0.00 - 0.50	Concrete
0.50 - 1.00	Bentonite
1.00 - 5.00	Gravel
5.00 - 10.00	Bentonite

In-Situ Tests

PID	**0**
Hand Vane*	**2**
Standard Penetration Tests	**7**

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	**4**	Water	**0**
Geotechnical Samples			
Bulk	**2**	Large Bulk	**0**
Disturbed	**19**	Disturbed (NR)	**0**
Piston	**0**	Piston (NR)	**0**
Undisturbed	**0**	Undisturbed (NR)	**0**
Undisturbed Thin Wall			**0**
Undisturbed Thin Wall (NR)			**0**
Core Sample			**0**

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Split Spoon	1.20	-	-	4	15	450	15	N=15 (1,3/3,4,4,4)	
Split Spoon	2.50	-	-	5	23	450	23	N=23 (2,3/5,6,6,6)	
Split Spoon	3.50	-	-	6	25	450	25	N=25 (2,4/5,6,7,7)	
Split Spoon	4.50	-	-	12	28	450	28	N=28 (6,6/7,7,7,7)	
Split Spoon	6.00	-	-	10	37	450	37	N=37 (4,6/7,8,10,12)	
Split Spoon	7.50	-	-	15	42	450	42	N=42 (6,9/10,10,10,12)	
Split Spoon	9.55	-	-	16	49	450	49	N=49 (5,11/11,12,13,13)	

SPT Hammer Ref.	Energy Ratio (%)

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

CENTRAL ALLIANCE
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Log Type: **Cable Percussion**
Sheet 1 of 1

Exploratory Hole Number: **BH03**
PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	28/02/2019
		Finish Date:	28/02/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**10.00m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used
0.00 - 1.20	Inspection Pit	Hand Tools
1.20 - 10.00	Cable Percussion	Dando 2000

Strata Description	Depth (m) (Stratum Thickness)	Depth (m)
MADE GROUND: Brown mottled light grey gravelly sandy slightly organic CLAY. Gravel is angular to subrounded fine to coarse flint, brick and sandstone. Sand is fine to coarse.	(0.30)	0.30
MADE GROUND: Dark grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse sandstone, flint and clinker. Sand is fine to coarse.	(0.30)	0.60
Possible MADE GROUND: Light brown mottled bluish grey sandy CLAY with rare rootlets. Sand is fine to coarse.	(0.90)	1.50
Firm to stiff orangish brown mottled bluish grey slightly sandy slightly silty CLAY. Sand is fine to coarse.	(1.30)	2.80
Stiff bluish grey mottled light brown slightly silty CLAY. *From 5.00m becomes bluish grey.*	(7.20)	10.00
EOH at 10.00m - Scheduled Depth		

Depth (m)	Ref	Test Results	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill
0.20	ES				
0.20	1 D				
0.50	ES				
0.50	2 D				
0.80	3 D				
1.00	ES				
1.00	4 B				
1.20	5 D	SPT(S) 1.20m, N=15 (1,3/3,4,4,4)			
1.20 - 1.65	6 D		150		
1.50	ES	HV 1.50m, (p)=160 kPa (r)=24 kPa	1.50		
2.00	7 D	HV 2.00m, (p)=204 kPa (r)=56 kPa			
2.50 - 2.95	8 D	SPT(S) 2.50m, N=23 (2,3/5,6,6,6)			
3.00	9 D				
3.50 - 3.95	10 D	SPT(S) 3.50m, N=25 (2,4/5,6,7,7)			
4.00	11 D				
4.50 - 4.95	12 D	SPT(S) 4.50m, N=28 (6,6/7,7,7,7)			
5.00	13 D				
5.20	14 B				
6.00	15 D	SPT(S) 6.00m, N=37 (4,6/7,8,10,12)			
6.00 - 6.45	16 D				
7.00	17 D				
7.50 - 7.95	18 D	SPT(S) 7.50m, N=42 (6,9/10,10,10,12)		7.70	
8.00	19 D			8.00	
9.00	20 D				
9.55 - 10.00	21 D	SPT(S) 9.55m, N=49 (5,11/11,12,13,13)			

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
Monitoring Point/s Installed
Hammer Ref. & Energy Ratio (%) N/A(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	0.50	Concrete
0.50	1.00	Bentonite
1.00	5.00	Gravel
5.00	10.00	Bentonite

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.
	1.00 - 5.00	5.00	

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks
8.00	7.70	20	

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Log Type	Exploratory Hole Number
Header Sheet	**BH06B** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**10.76m**	0.00 - 1.20 1.20 - 10.76	Inspection Pit Cable Percussion	Hand Tools Dando 2000	Approved:	
Client:	**Sweco**	Logger:	**TW**	Grid System:	**OSGB**				Start Date:	04/03/2019
		Orientation:	**N/A**	Inclination:	**90°**				End Date:	04/03/2019

Hole Diameter

Depth (m)	Diam (mm)
10.76	150

Casing Diameter

Depth (m)	Diam (mm)
1.50	200

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
0.45	-	-	20	0.30	
10.60	-	-	20	10.30	

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)

If Methodology includes Dynamic Sampling refer to Runs table for info.

No Monitoring Point/s Installed

Backfill

Depth (m)	Legend Code
0.00 - 10.76	Grout

In-Situ Tests

PID	**0**
Hand Vane*	**4**
Standard Penetration Tests	**7**

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	**5**	Water	**0**
Geotechnical Samples			
Bulk	**3**	Large Bulk	**0**
Disturbed	**20**	Disturbed (NR)	**0**
Piston	**0**	Piston (NR)	**0**
Undisturbed	**0**	Undisturbed (NR)	**0**
Undisturbed Thin Wall			**1**
Undisturbed Thin Wall (NR)			**0**
Core Sample			**0**

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Cone	1.20	-	-	4	11	450	11	N=11 (2,2/3,2,3,3)	
Split Spoon	2.50	-	-	4	21	450	21	N=21 (2,2/5,5,5,6)	
Split Spoon	3.50	-	-	6	30	450	30	N=30 (2,4/5,6,7,12)	
Split Spoon	4.50	-	-	6	34	450	34	N=34 (2,4/6,8,10,10)	
Split Spoon	7.50	-	-	25	40	450	40	N=40 (12,13/11,9,10,10)	
Split Spoon	9.00	-	-	13	44	450	44	N=44 (5,8/11,11,11,11)	
Split Spoon	10.50	-	-	23	50	260		50 (10,13/50 for 110mm)	

SPT Hammer Ref.	Energy Ratio (%)

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)
10.30 - 10.50	60

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**

Sheet 1 of 2

Exploratory Hole Number: **BH06B**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	04/03/2019
		Finish Date:	04/03/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**10.76m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used
0.00 - 1.20	Inspection Pit	Hand Tools
1.20 - 10.76	Cable Percussion	Dando 2000

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Dark greyish brown gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint, brick, sandstone and asphalt. Sand is fine to coarse.		(0.30) 0.30								0.20 0.20	1 D 25 ES	
MADE GROUND: Light brown mottled grey gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint, brick, sandstone and clinker. Sand is fine to coarse.		(0.90)						0.30 0.45		0.50 0.50	2 D 26 ES	
										0.80	3 D	
										1.00 1.00	27 ES 4 B	
Possible MADE GROUND: Light brown mottled bluish grey sandy CLAY with iron staining. Sand is fine to coarse.		1.20 (0.30)								1.20 1.20 - 1.65	5 D 6 B	SPT(C) 1.20m, N=11 (2,2/3,2,3,3)
Stiff bluish grey mottled light brown slightly sandy silty CLAY with iron staining. Sand is fine to coarse.		1.50					200 1.50			1.50	28 ES	HV 1.70m, (p)=204 kPa (r)=40 kPa
										2.00 2.00	29 ES 7 D	
										2.50 - 2.95	8 D	SPT(S) 2.50m, N=21 (2,2/5,5,5,6) HV 2.50m, (p)=192 kPa (r)=28 kPa
										3.00	9 D	
		(3.50)								3.50 - 3.95	10 D	SPT(S) 3.50m, N=30 (2,4/5,6,7,12) HV 3.50m, (p)=208 kPa (r)=48 kPa
										4.00	11 D	
From 4.50m becomes very stiff with no staining.										4.50 - 4.95	12 D	SPT(S) 4.50m, N=34 (2,4/6,8,10,10) HV 4.50m, (p)=200 kPa (r)=24 kPa
Very stiff bluish grey silty CLAY.		5.00								5.00 5.20	13 D 14 B	
										6.00 6.00 - 6.45	15 D 16 UT	40 blows, 100% Recovery
										6.50	17 D	
										7.00	18 D	
										7.50 - 7.95	19 D	SPT(S) 7.50m, N=40 (12,13/11,9,10,10)
		(5.76)								8.00	20 D	
										9.00 9.00 - 9.45	21 D 22 D	SPT(S) 9.00m, N=44 (5,8/11,11,11,11)
Continued on Next Page										10.00	23 D	

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
No Monitoring Point Installed
Hammer Ref.& Energy Ratio (%) N/A(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	10.76	Grout

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks
0.45	0.30	20	
10.60	10.30	20	

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Log Type: **Cable Percussion**

Sheet 2 of 2

Exploratory Hole Number: **BH06B**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	04/03/2019
		Finish Date:	04/03/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**10.76m**
Logged By:	**TW**	Grid System:	**OSGB**
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
Very stiff bluish grey silty CLAY.				60				10.30		10.50 - 10.76	24 D	SPT(S) 10.50m, 50 (10,13/50 for 110mm)
						150		10.60				
EOH at 10.76m - Refusal		10.76				10.76						

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
No Monitoring Point Installed
Hammer Ref & Energy Ratio (%) N/A(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks

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Log Type	Exploratory Hole Number
Header Sheet	**BH08** PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details				Methodology & Plant			Scale:	1:50
Name:	**Fridays AD Plant**	Easting:	**N/A**	Northing:	**N/A**	From (m)	Method	Plant Used	Checked:	
Location:	**Kent**	Elevation:	**N/A**	Final Depth:	**10.00m**	0.00 - 1.20 1.20 - 10.00	Inspection Pit Cable Percussion Boring	Hand Tools Dando 2000	Approved:	
Client:	**Sweco**	Logger:	**TW**	Grid System:					Start Date:	28/02/2019
		Orientation:	**N/A**	Inclination:	**90°**				End Date:	28/02/2019

Hole Diameter

Depth (m)	Diam (mm)
10.00	150

Casing Diameter

Depth (m)	Diam (mm)
1.50	150

Groundwater Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
7.50	-	-	20	7.20	

Installation / Instrument Details

Date	Instrument Details	To (m)	Resp. Zone (m)	Diam (mm)
28/02/2019		5.00	1.00 - 5.00	

If Methodology includes Dynamic Sampling refer to Runs table for info.

Backfill

Depth (m)	Legend Code
0.00 - 0.50	Concrete
0.50 - 1.00	Bentonite
1.00 - 5.00	Gravel
5.00 - 10.00	Bentonite

In-Situ Tests

PID	**0**
Hand Vane*	**2**
Standard Penetration Tests	**7**

* One count indicates an average reported result of 3 tests carried out at one depth where available.

Sample Summary

Environmental Samples			
Soil	**5**	Water	**0**
Geotechnical Samples			
Bulk	**1**	Large Bulk	**0**
Disturbed	**19**	Disturbed (NR)	**0**
Piston	**0**	Piston (NR)	**0**
Undisturbed	**0**	Undisturbed (NR)	**0**
Undisturbed Thin Wall			**0**
Undisturbed Thin Wall (NR)			**0**
Core Sample			**0**

(NR) Indicates sample undertaken but with 0% Recovery

Standard Penetration Test Summary

Test Type	Depth (m)	Casing (m)	Water (m)	Seating Blows	Main Blows	Penetration Total (mm)	N	Reported Result	Hammer Ref
Split Spoon	1.20	-	-	3	17	450	17	N=17 (1,2/3,4,5,5)	
Split Spoon	2.50	-	-	8	28	450	28	N=28 (2,6/6,6,8,8)	
Split Spoon	3.50	-	-	7	29	450	29	N=29 (3,4/5,8,8,8)	
Split Spoon	4.50	-	-	14	50	335		50 (4,10/50 for 185mm)	
Split Spoon	6.00	-	-	13	35	450	35	N=35 (6,7/7,8,10,10)	
Split Spoon	7.50	-	-	13	46	450	46	N=46 (5,8/10,11,12,13)	
Split Spoon	9.55	-	-	17	50	450	50	N=50 (6,11/12,12,14,12)	

SPT Hammer Ref.	Energy Ratio (%)

Applicable to Cable Percussion Only

Chiselling

Depth (m)	Duration (mins)

Water Added

Depth (m)	Litres

Applicable to Rotary Only

Drilling Flush

Depth (m)	Flush Type	Flush Colour	Return %

Applicable to Dynamic Sampling Only

Dynamic Sampling Runs

Depth (m)	Diam (mm)	Recovery %	Remarks

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Log Type: **Cable Percussion**

Sheet 1 of 1

Exploratory Hole Number: **BH08**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:50
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	28/02/2019
		Finish Date:	28/02/2019

Location Details:

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**10.00m**
Logged By:	**TW**	Grid System:	
Orientation:	**N/A**	Inclination:	**90°**

Methodology & Plant

Depth (m)	Method	Plant Used
0.00 - 1.20	Inspection Pit	Hand Tools
1.20 - 10.00	Cable Percussion Boring	Dando 2000

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Light brown gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint, granite, sandstone and clinker. Sand is fine to coarse.		(0.60)								0.20	1 D	
										0.20	21 ES	
		0.60								0.50	2 D	
MADE GROUND: Light brown mottled bluish grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint, sandstone and mudstone. Sand is fine to coarse.										0.50	22 ES	
										0.80	3 D	
		(0.90)								1.00	23 ES	
										1.00	4 B	
										1.20	5 D	SPT(S) 1.20m, N=17 (1,2/3,4,5,5)
										1.20 - 1.65	6 D	
		1.50					150					
Firm to stiff bluish grey mottled light brown silty CLAY with rootlets and sand lenses. Sand is coarse.							1.50			1.50	24 ES	
										2.00	25 ES	HV 2.00m, (p)=124 kPa (r)=36 kPa
										2.00	7 D	
		(1.80)								2.50 - 2.95	8 D	SPT(S) 2.50m, N=28 (2,6/6,6,8,8)
										3.00	9 D	HV 3.00m, (p)=148 kPa (r)=44 kPa
		3.30										
Very stiff bluish grey mottled light brown silty CLAY.										3.50 - 3.95	10 D	SPT(S) 3.50m, N=29 (3,4/5,8,8,8)
										4.00	11 D	
										4.50 - 4.95	12 D	SPT(S) 4.50m, 50 (4,10/50 for 185mm)
		(2.70)								5.00	13 D	
		6.00								6.00	14 D	SPT(S) 6.00m, N=35 (6,7/7,8,10,10)
Very stiff bluish grey slightly silty CLAY.										6.00 - 6.45	15 D	
								7.20		7.00	16 D	
								7.50		7.50 - 7.95	17 D	SPT(S) 7.50m, N=46 (5,8/10,11,12,13)
		(4.00)								8.00	18 D	
										9.00	19 D	
										9.55 - 10.00	20 D	SPT(S) 9.55m, N=50 (6,11/12,12,14,12)
		10.00				150						
EOH at 10.00m - Scheduled Depth						10.00						

Observations / Remarks

Misc.

Groundwater Encountered
Casing Used
Monitoring Point/s Installed
Hammer Ref. & Energy Ratio (%) N/A(%)

Shift Information

Date	Time	Depth (m)	Casing (m)	Water (m)

Backfill

From (m)	To (m)	Material
0.00	0.50	Concrete
0.50	1.00	Bentonite
1.00	5.00	Gravel
5.00	10.00	Bentonite

Installations

Instrument Details	Resp. Zone	Depth (m)	Diam.
	1.00 - 5.00	5.00	

Groundwater Strikes

Strike (m)	Rises To (m)	Time (min)	Remarks
7.50	7.20	20	

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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP12**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:30
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	05/03/2019
		Finish Date:	05/03/2019

Location Details

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**2.00m**
Logger:	**GS**	Grid System:	
Orientation:		Inclination:	

Methodology & Plant

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.10)				0.00 - 1.00 0.50 0.80 1.00	4 B 1 D 2 ES 3 D	
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		1.10 (0.90)				1.20 - 2.00 1.40 1.50	7 B 5 ES 6 D	
EOH at 2.00m - Scheduled Depth		2.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP13**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: Inclination:	

Scale: 1:30
Checked By:
Approved By:
Start Date: 05/03/2019
Finish Date: 05/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.60)				0.00 - 1.50 0.50 1.00 1.00 1.50	3 B 1 D 2 D 4 ES 5 D	
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		1.60 (0.40)				1.65 - 2.00 1.70	7 B 6 ES	
EOH at 2.00m - Scheduled Depth		2.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP14**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: Inclination:	

Scale: 1:30
Checked By:
Approved By:
Start Date: 05/03/2019
Finish Date: 05/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.80)				0.00 - 1.70 0.50 1.00 1.00 1.50	4 B 1 D 2 D 3 ES 5 D	
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		1.80 (0.20) 2.00				1.85 - 2.00 1.90	7 B 6 ES	
EOH at 2.00m - Scheduled Depth								

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

CENTRAL ALLIANCE
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Web: www.central-alliance.co.uk

Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP15**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: Inclination:	

Scale: 1:30
Checked By:
Approved By:
Start Date: 05/03/2019
Finish Date: 05/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.65)				0.00 - 1.50 0.50 1.00 1.00 1.50	3 B 1 D 2 D 4 ES 5 D	
From 1.55m to 1.65m becomes gravelly with asphalt gravel.						1.60 1.60 1.70 - 2.00	6 D 7 ES 8 B	
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		1.65 (0.35)						
EOH at 2.00m - Scheduled Depth		2.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP16**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: Inclination:	

Scale: 1:30
Checked By:
Approved By:
Start Date: 05/03/2019
Finish Date: 05/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.60)				0.00 - 1.50 0.50 1.00 1.00 1.50	4 B 1 D 2 D 3 ES 5 D	
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		1.60 (0.40)				1.65 - 2.00 1.70	7 B 6 ES	
EOH at 2.00m - Scheduled Depth		2.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP17**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: Inclination:	

Scale: 1:30
Checked By:
Approved By:
Start Date: 05/03/2019
Finish Date: 05/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.70)				0.00 - 1.60 0.50 1.00 1.00 1.50	4 B 1 D 2 D 3 ES 5 D	
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		1.70 (0.30)				1.75 - 2.00 1.80	7 B 6 ES	
EOH at 2.00m - Scheduled Depth		2.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP18**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details		Methodology & Plant	Scale: 1:30
Name:	**Fridays AD Plant**	Easting: **N/A**	Northing: **N/A**		Checked By:
Location:	**Kent**	Elevation: **N/A**	Final Depth: **2.00m**		Approved By:
Client:	**Sweco**	Logger: **GS**	Grid System:		Start Date: 05/03/2019
		Orientation:	Inclination:		Finish Date: 05/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.20)				0.00 - 1.10 0.50 1.00 1.00	4 B 1 D 2 D 3 ES	
		1.20						
MADE GROUND: Soft black and greyish orange slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint, mudstone and asphat.		(0.30)				1.30 1.30	5 D 6 ES	
		1.50						
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		(0.50)				1.60 - 2.00	7 B	
		2.00						
EOH at 2.00m - Scheduled Depth								

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP19**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: Inclination:	

Scale: 1:30
Checked By:
Approved By:
Start Date: 05/03/2019
Finish Date: 05/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, limestone, brick and flint.		(1.10)				0.00 - 1.00 0.50 1.00 1.00 1.50 1.75 - 2.00 1.80	4 B 1 D 2 D 3 ES 5 ES 7 B 6 ES	
MADE GROUND: Soft to firm orangish grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint, brick and limestone.		1.10 (0.60)						
MADE GROUND: Soft to firm reddish orange gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse mudstone, sandstone, flint and brick. Sand is fine to coarse.		1.70 (0.30)						
EOH at 2.00m - Scheduled Depth		2.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: Stability: Stable Backfill: Arisings	0.50m 3.00m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP01**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **4.00m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 06/03/2019
Finish Date: 06/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft greyish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse sandstone, flint and occasional brick. Sand is fine to coarse.		(0.40)				0.20	1 ES	
MADE GROUND: Soft orange brown sandy clayey subangular to subrounded fine to coarse clinker, ash and flint GRAVEL.		0.40 (0.15)				0.50 0.50 0.60 - 0.85	2 D 3 ES 6 B	HV 0.50m, (p)=51 kPa (r)=3 kPa
MADE GROUND: Soft to firm greyish brown slightly sandy CLAY. Sand is fine to coarse.		0.55 (0.35)						
Firm grey and brown silty CLAY.		0.90 (1.70)				1.00 1.00 1.00 - 2.00 1.50 1.50	4 D 5 ES 9 B 7 D 8 ES	HV 1.00m, (p)=101 kPa (r)=8 kPa
Firm to stiff thinly laminated silty CLAY.		2.60 (0.60)				2.70 2.70 - 3.20	10 D 11 B	HV 3.00m, (p)=114 kPa (r)=16 kPa
Grey clayey subangular fine to coarse mudstone and flint GRAVEL.		3.20 (0.80)				3.30 - 4.00	12 B	
EOH at 4.00m - Scheduled depth		4.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP02**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **4.30m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 07/03/2019
Finish Date: 07/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft brownish grey slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse sandstone, flint and rare brick.		(0.20) 0.20				0.20	1 ES	
MADE GROUND: Soft black slightly sandy very gravelly CLAY. Gravel is subangular to subrounded fine to coarse clinker, ash and rare brick. Sand is fine to coarse.		(0.20) 0.40				0.50 0.50	2 D 3 ES	
MADE GROUND: Firm slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse brick and occasional clinker.		(0.40) 0.80				0.90 - 1.80	8 B	
Firm to stiff orange and grey silty CLAY.		(1.10) 1.90				1.00 1.00 1.50 1.50	4 D 5 ES 6 D 7 ES	HV 1.50m, (p)=89 kPa (r)=9 kPa
Stiff grey and bluish grey thinly laminated CLAY.		(0.90) 2.80				2.00 2.00 - 2.70	9 D 10 B	
Grey subangular fine to coarse mudstone GRAVEL with oxidation layers.		(1.50) 4.30				3.00 - 4.00	11 B	HV 3.00m, (p)=112 kPa (r)=10 kPa
EOH at 4.30m - Scheduled depth								

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP03**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **4.20m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 07/03/2019
Finish Date: 07/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Orangish brown and black clayey sandy sub-angular to sub-rounded fine to coarse clinker, ash and occasional brick GRAVEL. Sand is fine to coarse.		(1.10)				0.20 0.50 0.50 1.00 1.00	1 ES 2 D 3 ES 4 D 5 ES	
1.10								
MADE GROUND: Firm to stiff orange and grey silty CLAY. *From 1.10m to 1.30m probable reworked soil.*		(1.10)				1.20 - 2.00 1.50 1.50	8 B 6 D 7 ES	HV 1.50m, (p)=92 kPa (r)=8 kPa
2.20								
Stiff orange and grey laminated CLAY.		(0.50)				2.50	9 D	HV 2.50m, (p)=118 kPa (r)=13 kPa
2.70								
Stiff orange and grey gravelly CLAY. Gravel is sub-angular fine to coarse mudstone.		(0.70)				2.80 - 3.30 3.00	11 B 10 D	
3.40								
Grey and orange sub-angular fine to coarse mudstone GRAVEL with oxidation layers present.		(0.80)				3.50 - 4.20	12 B	
4.20								
EOH at 4.20m - Scheduled depth								

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP04**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **4.00m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 06/03/2019
Finish Date: 06/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft greyish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse sandstone, flint and occasional mudstone and brick. Sand is fine to coarse.		(0.60)						
MADE GROUND: Soft orange and black sandy clayey subangular to subrounded fine to coarse clinker, ash and flint GRAVEL. Sand is fine to coarse.		0.60 (0.30)				0.60 - 0.90	6 B	
Firm to stiff grey and brown silty CLAY with occasional thin fine sand layer. Sand is fine to coarse. *From 0.90m to 1.20m probable reworked soil.*		0.90 (1.10)				1.00 - 2.00 1.50 1.50	9 B 7 D 8 ES	HV 1.00m, (p)=93 kPa (r)=8 kPa HV 1.50m, (p)=112 kPa (r)=11 kPa
Firm to stiff thinly laminated silty CLAY.		2.00 (1.50)				2.00 - 3.00 2.50	11 B 10 D	HV 3.00m, (p)=111 kPa (r)=9 kPa
Grey clayey subangular fine to coarse mudstone and flint GRAVEL.		3.50 (0.50)				3.50 - 4.00 3.80	13 B 12 D	
EOH at 4.00m - Scheduled depth		4.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP05**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Scale:	1:30
Name:	**Fridays AD Plant**	Checked By:	
Location:	**Kent**	Approved By:	
Client:	**Sweco**	Start Date:	07/03/2019
		Finish Date:	07/03/2019

Location Details

Easting:	**N/A**	Northing:	**N/A**
Elevation:	**N/A**	Final Depth:	**4.20m**
Logger:	**GS**	Grid System:	
Orientation:	**N/A**	Inclination:	**N/A**

Methodology & Plant

Trial Pit

Wheeled Backhoe Excavator

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft to firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse siltstone and occasional flint and brick.		(0.90)				0.00 - 0.80 0.20 0.50 0.50 0.50	7 B 1 ES 2 D 3 ES 4 D	
At 0.50m trace of hydrocarbons.								
MADE GROUND: Soft to firm brown and grey silty CLAY.		0.90 (0.70)				1.00 1.00	5 ES 6 D	
At 1.50m trace of hydrocarbons.						1.50 1.50	8 ES 9 D	HV 1.50m, (p)=71 kPa (r)=4 kPa
Brown and black subangular to subrounded fine to coarse mudstone and flint GRAVEL.		1.60 (0.30)				1.70	10 D	
Stiff grey and orange laminated CLAY.		1.90 (0.80)				2.00 2.00 - 2.60	11 D 12 B	HV 2.50m, (p)=114 kPa (r)=9 kPa
Stiff grey and orange gravelly CLAY. Gravel is subangular fine to coarse mudstone.		2.70 (0.90)				2.80 2.80 - 3.50	13 D 14 B	
Grey and orange subangular fine to coarse mudstone GRAVEL with oxidation layers.		3.60 (0.60)				3.60 - 4.20	15 B	
EOH at 4.20m - Scheduled depth		4.20						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP06**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **4.20m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 07/03/2019
Finish Date: 07/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft brown and black slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse brick and sandstone. Sand is fine to coarse.		(0.80)				0.20	1 ES	
At 0.50m trace of hydrocarbons.						0.50	2 D	
						0.50	3 ES	
MADE GROUND: Firm brown and grey slightly gravelly silty CLAY. Gravel is subangular fine to coarse brick and sandstone.		0.80						
		(0.80)				1.00	4 D	
						1.00	5 ES	
MADE GROUND: Black and reddish brown sandy clayey subangular to subrounded fine to coarse flint and clinker GRAVEL.		1.60 (0.20)				1.50	6 D	
						1.50	7 ES	
Firm to stiff bluish grey and brown laminated CLAY.		1.80				2.00	8 D	
						2.00	9 ES	
From 2.30m to 2.50m subangular fine to coarse flint gravel.						2.00 - 3.50	11 B	HV 2.50m, (p)=118 kPa (r)=12 kPa
		(2.00)				3.00	10 D	HV 3.50m, (p)=115 kPa (r)=9 kPa
Grey and orange subangular fine to coarse mudstone GRAVEL with oxidation layers.		3.80 (0.40)				3.90 - 4.20	12 B	
EOH at 4.20m - Scheduled depth		4.20						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP07**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **4.50m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 06/03/2019
Finish Date: 06/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft dark brown and black gravelly CLAY. Gravel in subangular to subrounded clinker, ash and flint.		(0.60)				0.20	1 ES	
						0.50	2 D	
						0.50	3 ES	
MADE GROUND: Soft orangish grey slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse clinker and occasional brick.		0.60 (0.30)				0.65 - 0.90	6 B	
Firm to stiff grey and orange silty CLAY.		0.90				1.00	4 D	
						1.00	5 ES	
						1.00 - 2.00	9 B	
						1.50	7 D	HV 1.50m, (p)=89 kPa (r)=8 kPa
						1.50	8 ES	
		(1.60)						HV 2.00m, (p)=92 kPa (r)=7 kPa
Stiff greyish brown gravelly CLAY.		2.50				2.50	10 D	HV 2.50m, (p)=109 kPa (r)=9 kPa
						2.50 - 3.00	11 B	
						3.00 - 4.00	13 B	HV 3.00m, (p)=101 kPa (r)=8 kPa
		(1.50)						
						3.50	12 D	
Brown and grey clayey subangular fine to coarse mudstone and flint GRAVEL.		4.00 (0.50)				4.00 - 4.50	14 B	
EOH at 4.50m - Scheduled depth		4.50						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE

EXPLORE > IDENTIFY > DELIVER

Alliance House, South Park Way
Wakefield 41 Business Park
Wakefield WF2 0XJ
Tel +44(0)1924 229889
Web: www.central-alliance.co.uk

Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP08**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **1.60m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 06/03/2019
Finish Date: 06/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
Black and grey very gravelly CLAY. Gravel is subangular to subrounded fine to coarse clinker, ash and brick.		(1.60)				1.00	1 ES	
At 1.50m timber and black plastic bags filled with animal remains.		1.60						
EOH at 1.60m - Abandoned upon engineers instruction								

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
Biohazard found in pit (animal remains).	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP08A**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **0.80m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 06/03/2019
Finish Date: 06/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
Black and grey very gravelly CLAY with hydrocarbon odour. Gravel is subangular to subrounded fine to coarse clinker, ash and brick.		(0.80)				0.20 - 0.50	2 B	
						0.50	1 ES	
EOH at 0.80m - Abandoned upon engineers instruction		0.80						

1 2 3 4 5 6

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
Biohazard found in pit (animal remains).	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	2.50m 0.50m Orientation: °

CENTRAL ALLIANCE
EXPLORE > IDENTIFY > DELIVER

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Wakefield WF2 0XJ
Tel +44(0)1924 229889
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Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP20**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 07/03/2019
Finish Date: 07/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft greyish brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse siltstone and occasional sandstone and brick.		(1.80)				0.00 - 1.70	4 B	
						0.50	1 D	
						1.00	2 ES	HV 1.00m, (p)=51 kPa (r)=3 kPa
						1.50	3 D	
Soft to firm orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse clinker, ash and occasional brick and sandstone. Sand is fine to coarse.		1.80 (0.20)				1.90	5 D	
		2.00				1.90	6 ES	
EOH at 2.00m - Scheduled depth								

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

CENTRAL ALLIANCE
EXPLORE > IDENTIFY > DELIVER

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Wakefield 41 Business Park
Wakefield WF2 0XJ
Tel +44(0)1924 229889
Web: www.central-alliance.co.uk

Log Type: **Trial Pit**

Sheet 1 of 1

Exploratory Hole Number: **TP21**

PRELIM

CENTRAL ALLIANCE GEO

Project No:	**4246**	Location Details	Methodology & Plant
Name:	**Fridays AD Plant**	Easting: **N/A** Northing: **N/A**	Trial Pit
Location:	**Kent**	Elevation: **N/A** Final Depth: **2.00m**	Wheeled Backhoe Excavator
Client:	**Sweco**	Logger: **GS** Grid System:	
		Orientation: **N/A** Inclination: **N/A**	

Scale: 1:30
Checked By:
Approved By:
Start Date: 07/03/2019
Finish Date: 07/03/2019

Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Water Level (m)	Installation / Backfill	Samples & Testing: Depth (m)	Ref	Test Results
MADE GROUND: Soft greyish brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse siltstone and occasional sandstone and brick.		(1.80)				0.00 - 1.70 0.20 0.50 0.50 0.50 1.00 1.00 1.00	3 B 1 ES 1 D 2 D 3 ES 2 ES 4 D 5 ES	HV 1.00m, (p)=58 kPa (r)=4 kPa
MADE GROUND: Firm grey and reddish orange silty CLAY.		1.80 (0.20)				1.90 1.90	4 D 5 ES	HV 1.90m, (p)=79 kPa (r)=5 kPa
EOH at 2.00m - Scheduled depth		2.00						

Observations / Remarks	Breaking Out / Hard Strata		Stability & Backfill	Pit Dimensions
	From (m)	Remarks	Shoring: None Stability: Stable Backfill: Arisings	3.00m 0.50m Orientation: °

LABORATORY REPORT

4043

Contract Number: PSL19/1570

Report Date: 01 April 2019

Client's Reference: 4246-002

Client Name: Central Alliance
Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

For the attention of: Ben Haswell

Contract Title: Fridays AD Plant

Date Received: 8/3/2019
Date Commenced: 8/3/2019
Date Completed: 1/4/2019

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)	A Watkins (Director)	R Berriman (Quality Manager)
S Royle (Laboratory Manager)	S Eyre (Senior Technician)	L Knight (Senior Technician)

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awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH02	3	D	0.80		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH02	6	D	1.20	1.65	Brown mottled grey slightly gravelly slightly sandy CLAY.
BH02	7	D	2.00		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH02	11	D	4.00		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH02	20	D	9.00		Grey slightly sandy CLAY.
BH03	5	D	1.20		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH03	7	D	2.00		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH03	9	D	3.00		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH03	13	D	5.00		Brown mottled grey slightly sandy CLAY.
BH06B	5	D	1.20		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH06B	7	D	2.00		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH06B	16	UT	6.00	6.45	Stiff grey slightly sandy CLAY
BH06B	21	D	9.00		Grey slightly sandy CLAY.
BH08	7	D	2.00		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH08	13	D	5.00		Brown mottled grey slightly gravelly slightly sandy CLAY.
BH08	19	D	9.00		Grey slightly sandy CLAY.
TP12	4	B	0.00	1.00	Dark brown slightly gravelly sandy CLAY.
TP13	3	B	0.00	1.50	Dark brown sandy CLAY.
TP13	7	B	1.65	2.00	Brown mottled grey slightly gravelly sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP14	4	B	0.00	1.70	Dark brown slightly gravelly slightly sandy CLAY.
TP14	1	D	0.50		Brown slightly gravelly slightly sndy CLAY.
TP15	8	B	1.70	2.00	Brown mottled grey slightly gravelly slightly sandy CLAY.
TP16	1	D	0.50		Brown slightly gravelly slightly sandy CLAY.
TP16	7	B	1.65	2.00	Brown slightly gravelly slightly sandy CLAY.
TP17	7	B	1.75	2.00	Brown mottled grey slightly sandy CLAY.
TP18	4	B	0.00	1.10	Brown slightly gravelly sandy CLAY.
TP18	7	B	1.60	2.00	Brown slightly gravelly sandy CLAY.
TP19	1	D	0.50		Brown slightly gravelly sandy CLAY.
TP19	7	B	1.75	2.00	Brown slightly gravelly slightly sandy 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
BH02	3	D	0.80		33							
BH02	6	D	1.20	1.65	29							
BH02	7	D	2.00		28							
BH02	11	D	4.00		34			61	26	35	91	High plasticity CH.
BH02	20	D	9.00		20							
BH03	5	D	1.20		28							
BH03	7	D	2.00		36			66	29	37	90	High plasticity CH.
BH03	9	D	3.00		31							
BH03	13	D	5.00		23							
BH06B	5	D	1.20		30							
BH06B	7	D	2.00		31							
BH06B	16	UT	6.00	6.45	23			70	30	40	100	High plasticity CH.
BH06B	21	D	9.00		20							
BH08	7	D	2.00		30			64	27	37	91	High plasticity CH.
BH08	13	D	5.00		21							
BH08	19	D	9.00		20							
TP12	4	B	0.00	1.00	26			48	23	25	92	Intermediate plasticity CI.
TP13	7	B	1.65	2.00	24							
TP14	1	D	0.50		27			54	25	29	89	High plasticity CH.

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

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

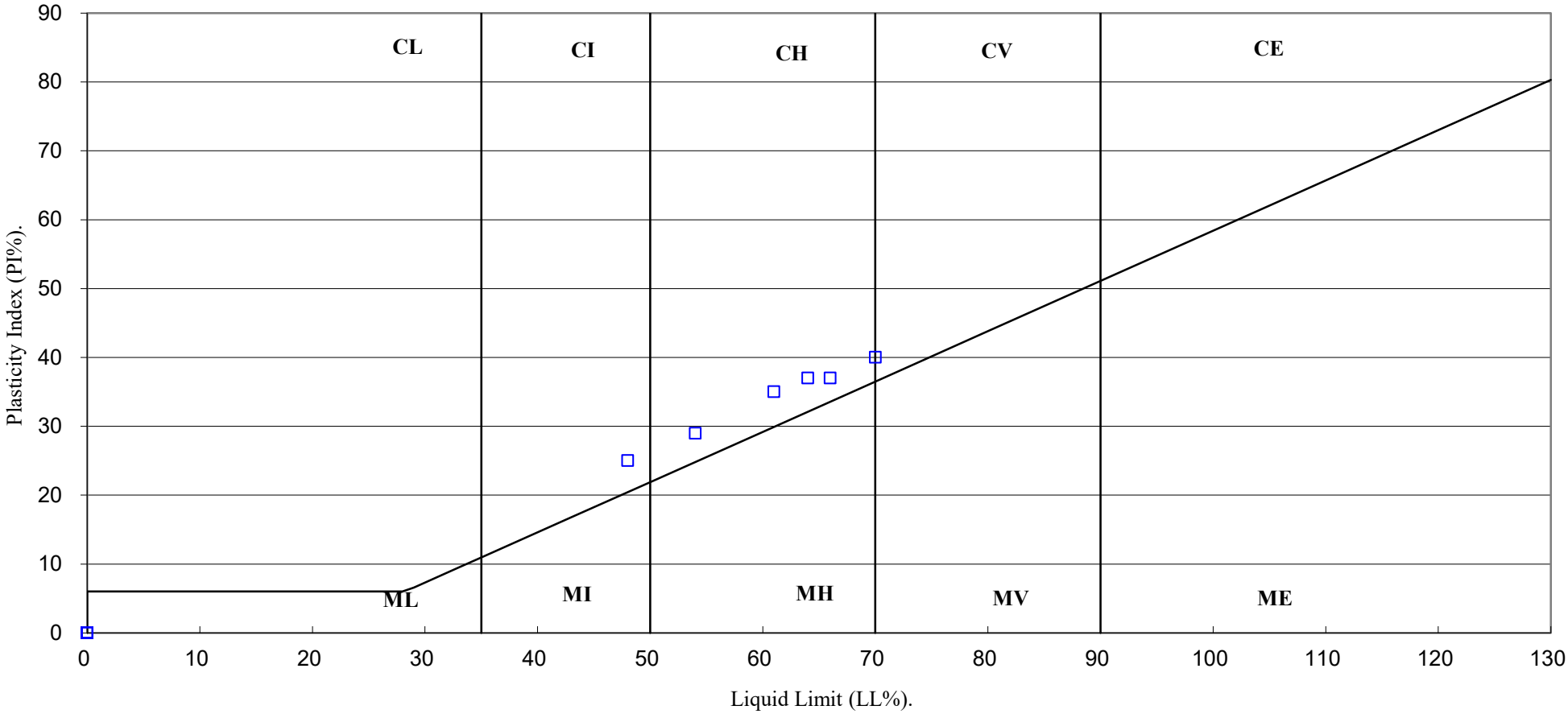
Contract No:

PSL19/1570

Client Ref:

4246

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Fridays AD Plant	Contract No: PSL19/1570 Client Ref: 4246

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
TP15	8	B	1.70	2.00	26							
TP16	1	D	0.50		28			63	27	36	93	High plasticity CH.
TP17	7	B	1.75	2.00	23			65	27	38	100	High plasticity CH.
TP18	7	B	1.60	2.00	23							
TP19	1	D	0.50		30							

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

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

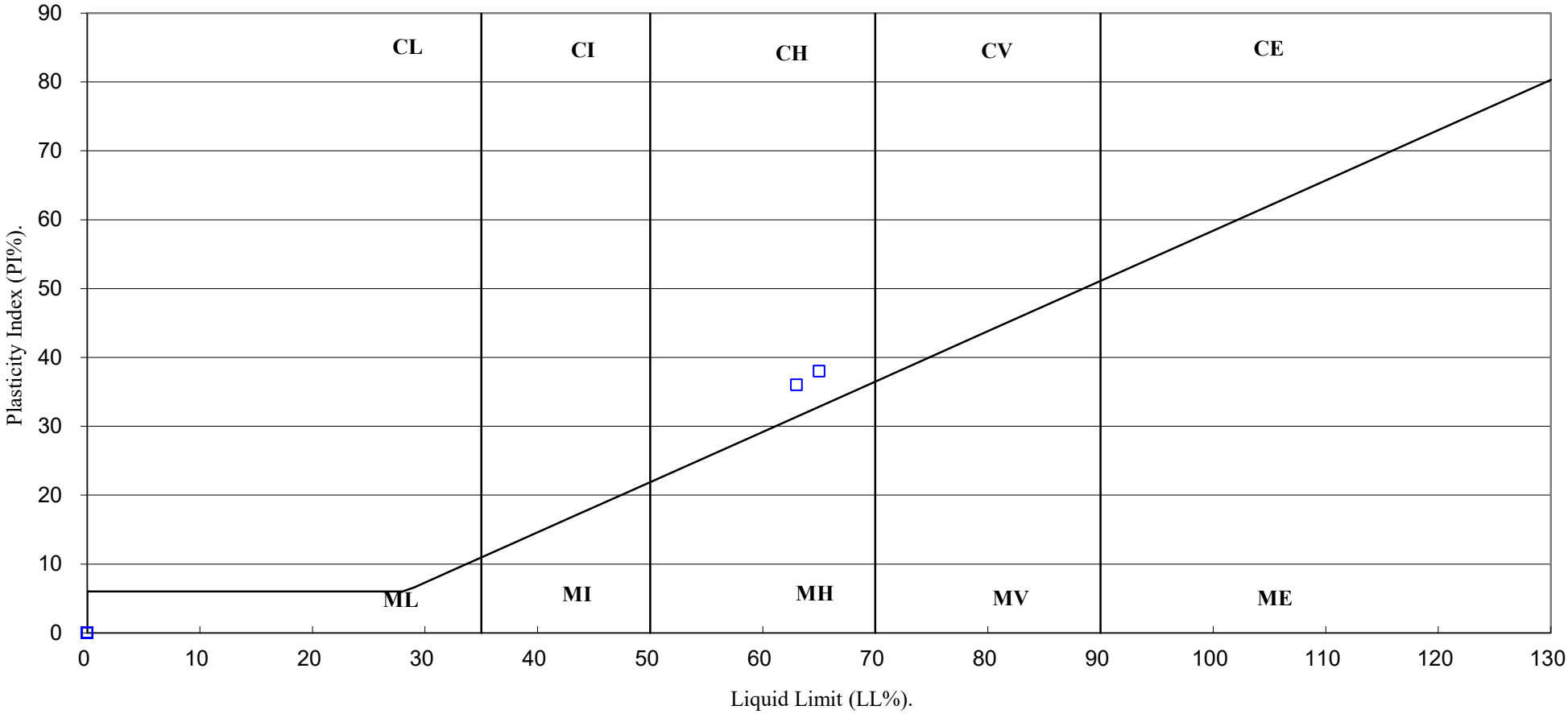
Contract No:

PSL19/1570

Client Ref:

4246

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



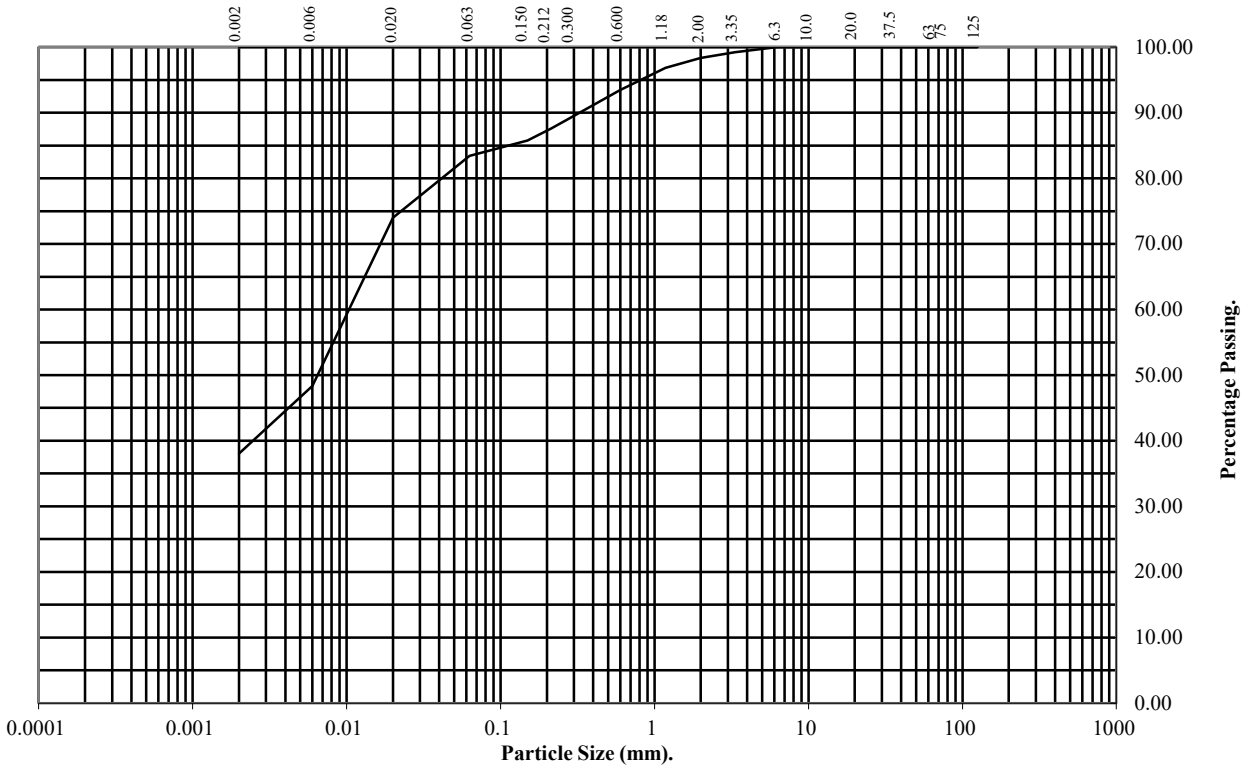
UKAS TESTING 4043	PSL Professional Soils Laboratory	Fridays AD Plant	Contract No: PSL19/1570 Client Ref: 4246

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP12**	**Top Depth (m):**	**0.00**
Sample Number:	**4**	**Base Depth(m):**	**1.00**
Sample Type:	**B**		



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	98
1.18	97
0.6	93
0.3	90
0.212	88
0.15	86
0.063	83

Particle Diameter	Percentage Passing
0.02	74
0.006	48
0.002	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	15
Silt	45
Clay	38

Remarks:

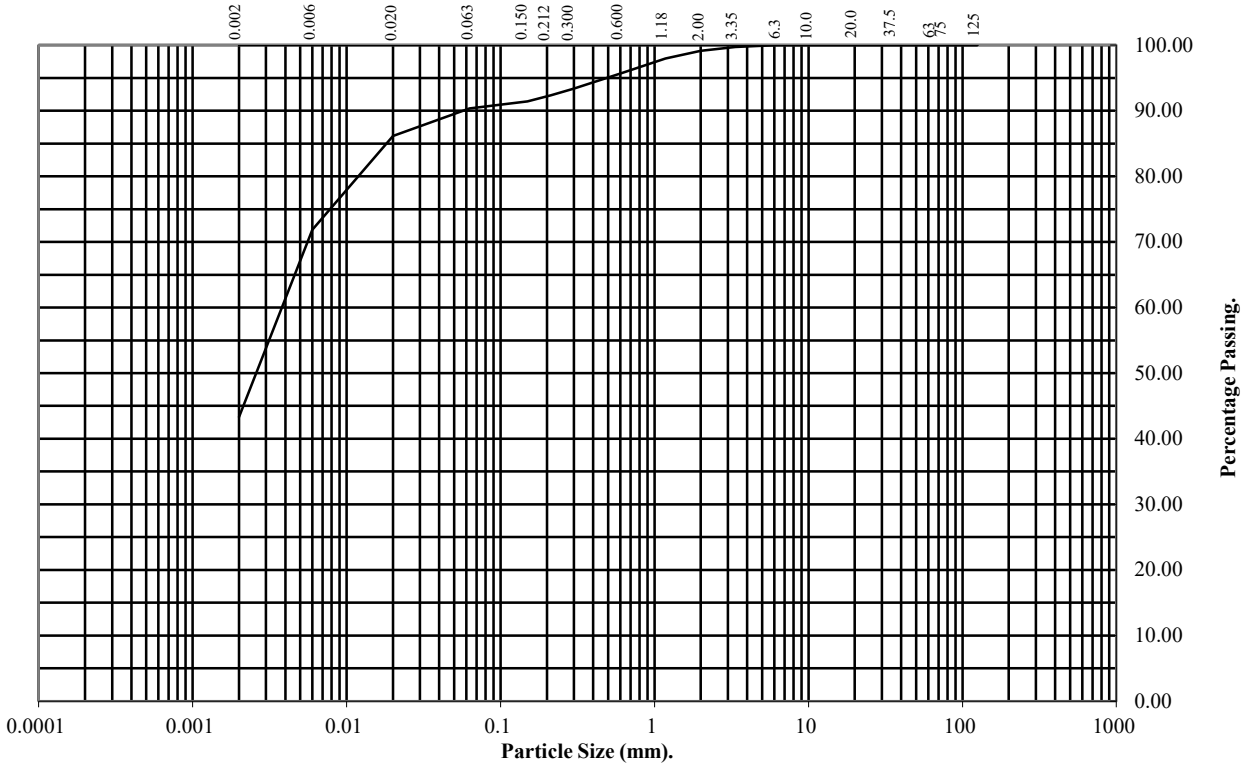
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP14**	**Top Depth (m):**	**0.00**
Sample Number:	**4**	**Base Depth(m):**	**1.70**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	98
0.6	96
0.3	93
0.212	92
0.15	91
0.063	90

Particle Diameter	Percentage Passing
0.02	86
0.006	72
0.002	43

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	9
Silt	47
Clay	43

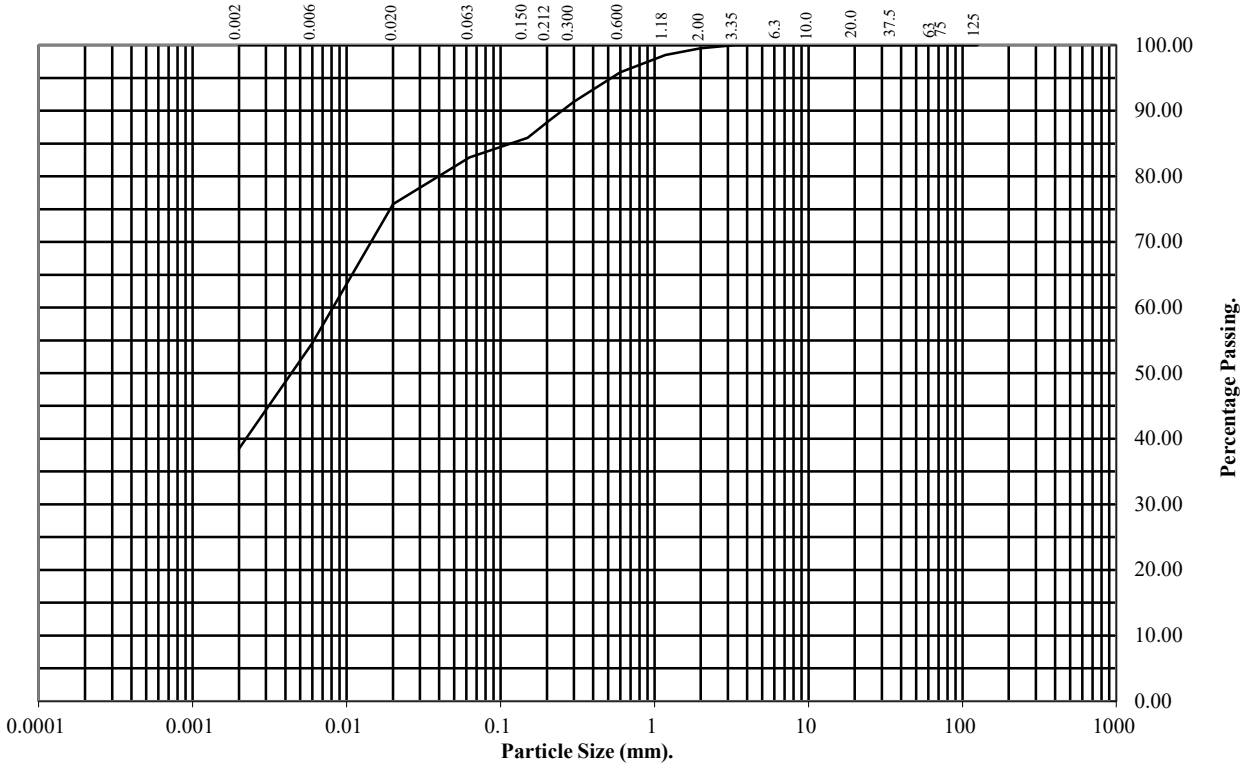
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP18**	**Top Depth (m):**	**0.00**
Sample Number:	**4**	**Base Depth(m):**	**1.10**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	98
0.6	96
0.3	91
0.212	89
0.15	86
0.063	83

Particle Diameter	Percentage Passing
0.02	76
0.006	55
0.002	39

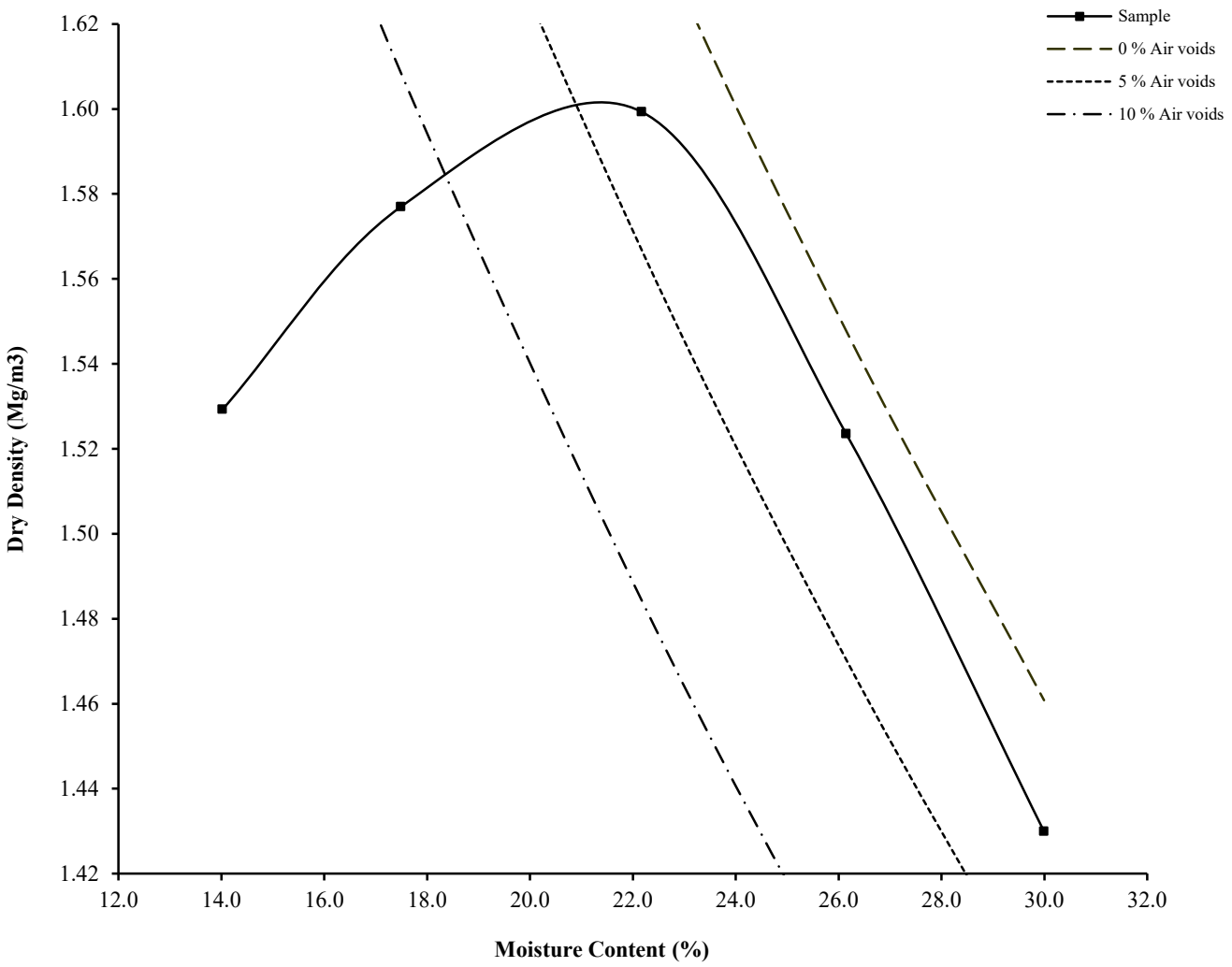
Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	17
Silt	44
Clay	39

Remarks:
See Summary of Soil Descriptions

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**TP12**	**Top Depth (m) :**	**0.00**
Sample Number:	**4**	**Base Depth (m) :**	**1.00**
Sample Type:	**B**		

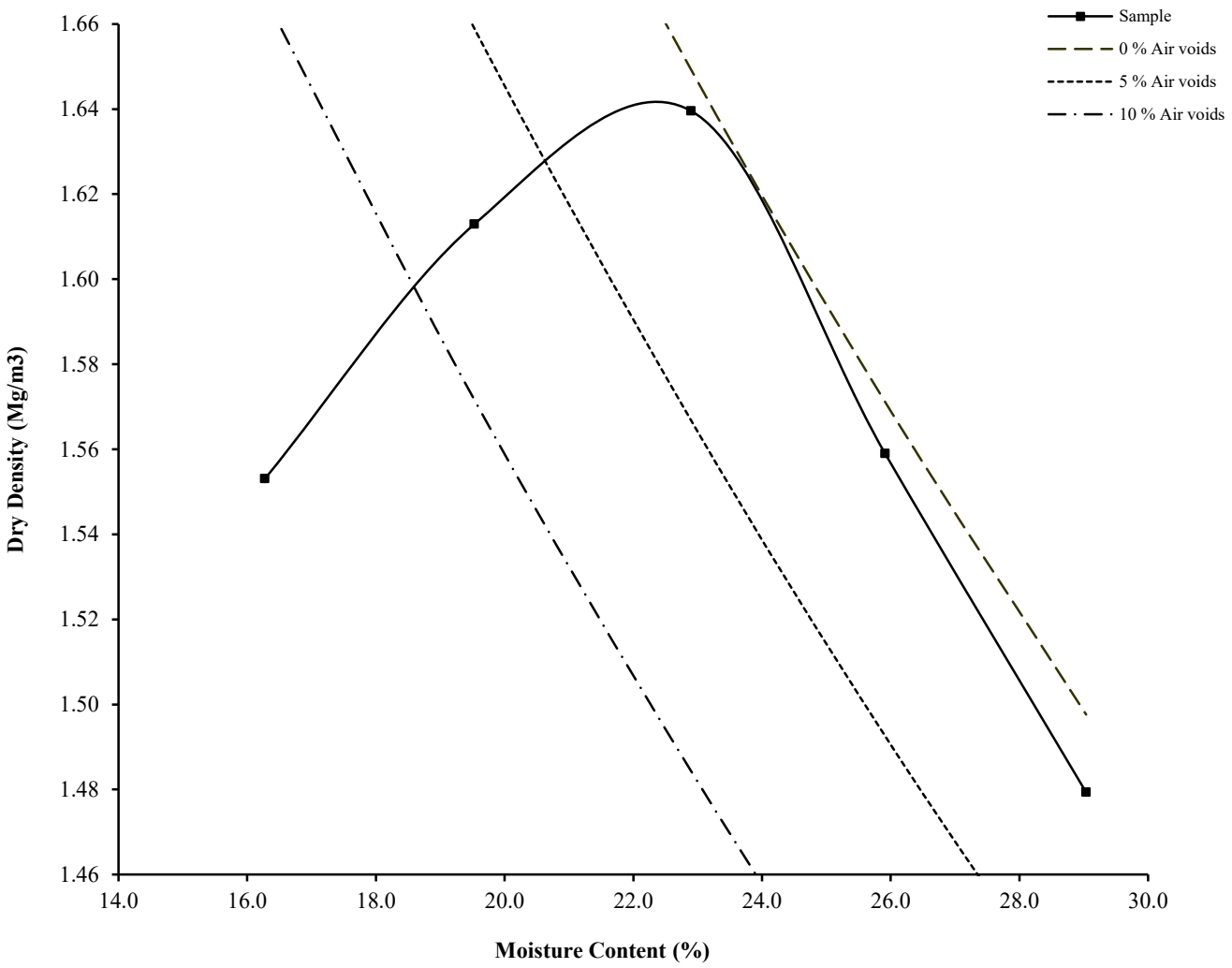


Initial Moisture Content:		26	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.60	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		22			
Remarks See summary of soil descriptions.					

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**TP18**	**Top Depth (m) :**	**1.60**
Sample Number:	**7**	**Base Depth (m) :**	**2.00**
Sample Type:	**B**		

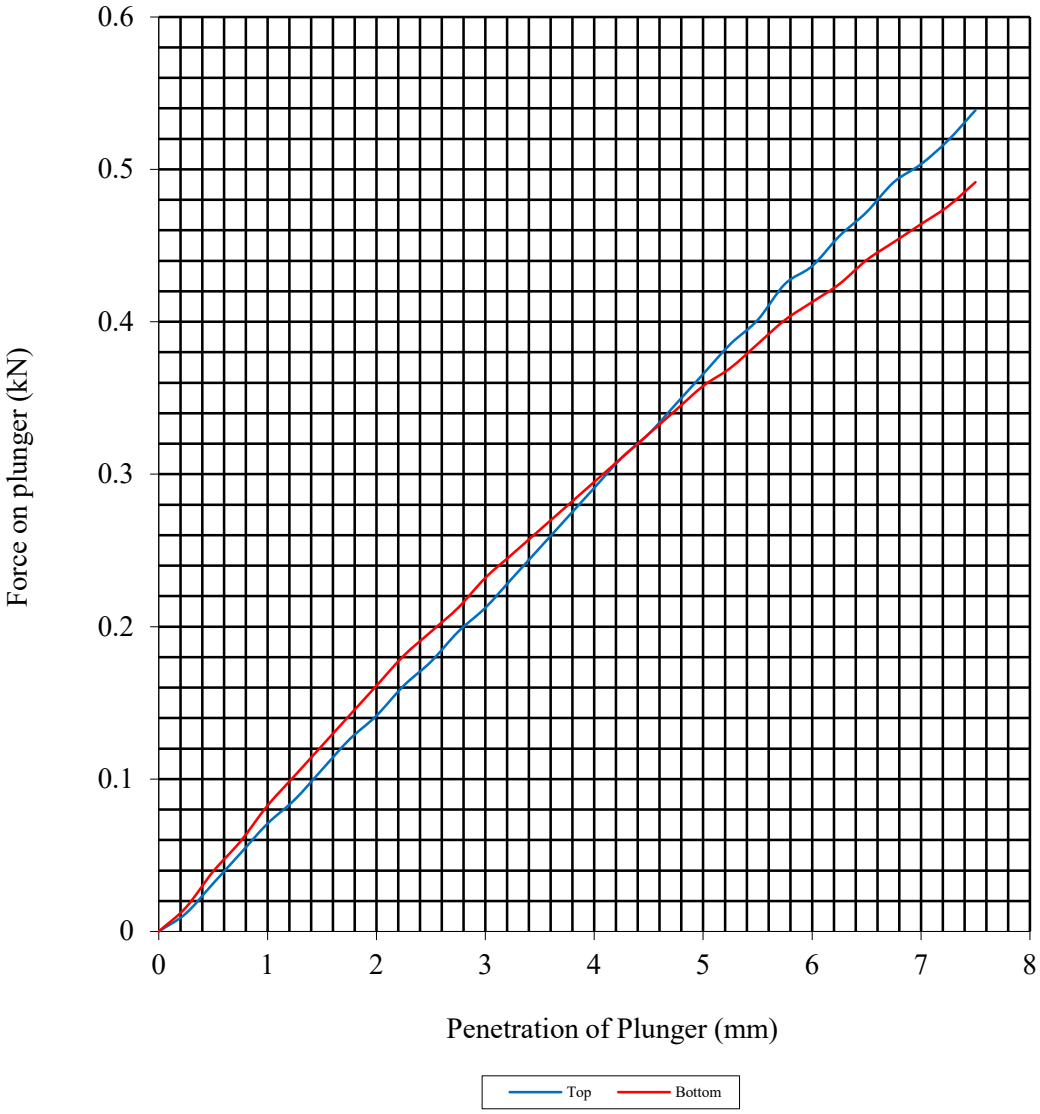


Initial Moisture Content:		23	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.64	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		23			
Remarks See summary of soil descriptions.					

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number:	**TP14**	**Top Depth (m):**	**0.00**
Sample Number:	**4**	**Base Depth (m):**	**1.70**
Sample Type:	**B**		



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	25	Surcharge Kg:	4.20	Sample Top	25	Sample Top	1.8
Bulk Density Mg/m3:	1.92	Soaking Time hrs	0	Sample Bottom	25	Sample Bottom	1.8
Dry Density Mg/m3:	1.53	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

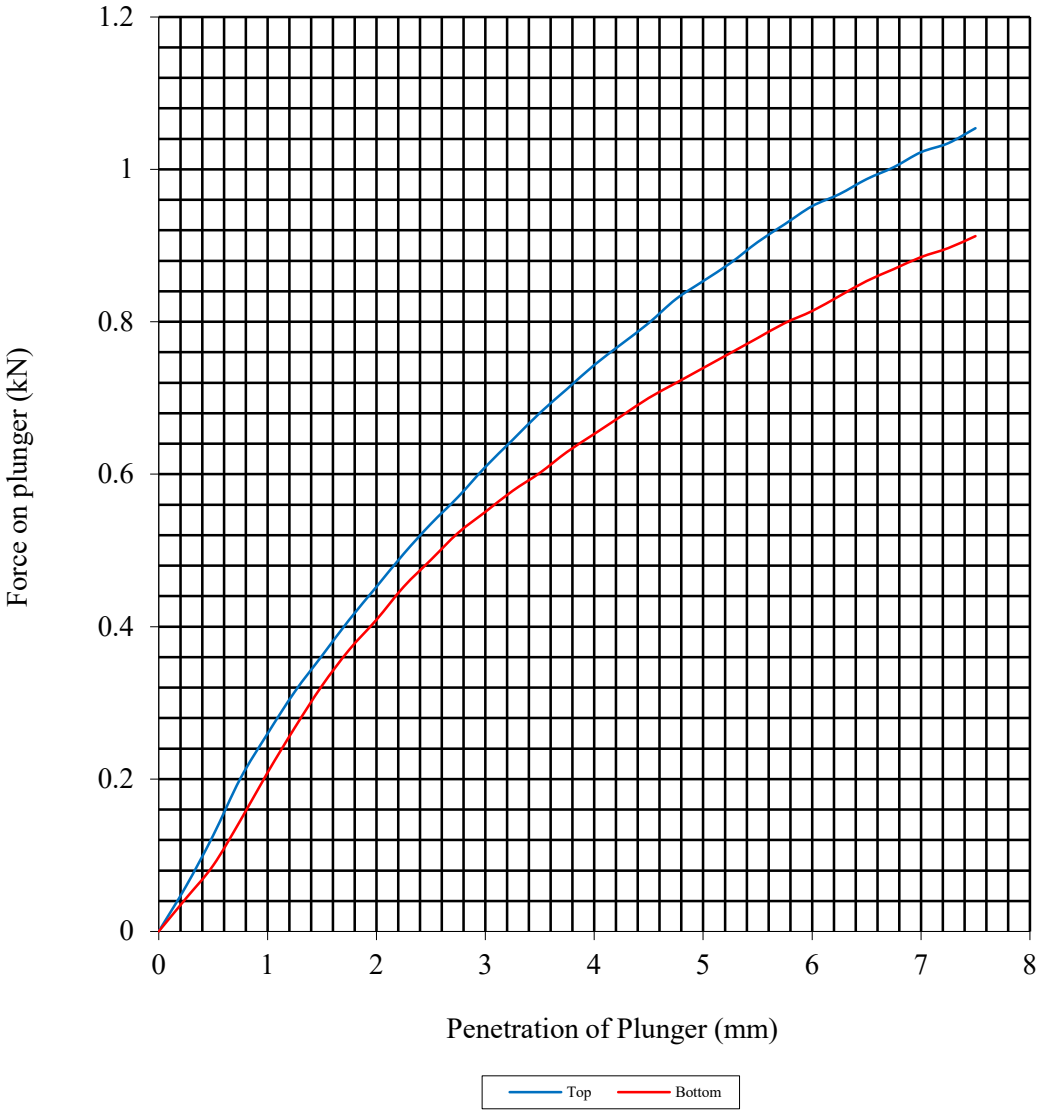
Fridays AD Plant

Contract No:
PSL19/1570
Client Ref:
4246

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number:	**TP16**	**Top Depth (m):**	**1.65**
Sample Number:	**7**	**Base Depth (m):**	**2.00**
Sample Type:	**B**		



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	26	Surcharge Kg:	4.20	Sample Top	26	Sample Top	4.3
Bulk Density Mg/m3:	1.97	Soaking Time hrs	0	Sample Bottom	26	Sample Bottom	3.7
Dry Density Mg/m3:	1.56	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			1				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

Contract No:
PSL19/1570
Client Ref:
4246

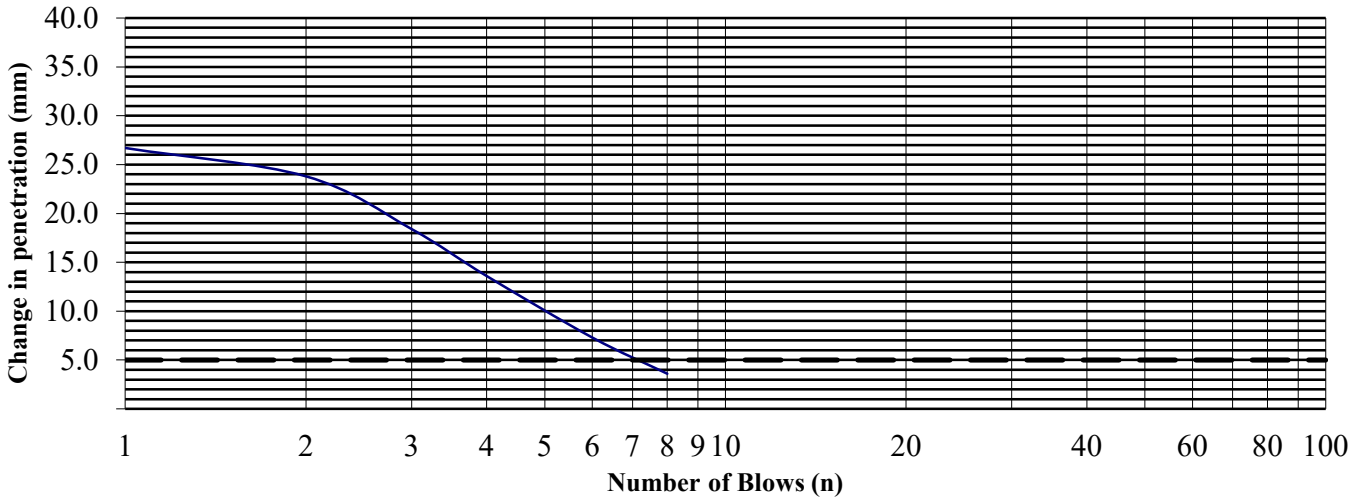
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP13**	**Top Depth (m):**	**0.00**
Sample Number:	**3**	**Base Depth (m):**	**1.50**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	107.2	26.7
2	93.8	23.8
3	85.8	18.4
4	80.5	13.6
6	73.8	7.3
8	70.0	3.6
12	67.4	
16	66.9	
24	66.5	
32	66.4	
48		
64		
96		
128		
192		
256		

Test Results.

Moisture Content (%)	25
MCV	8.8

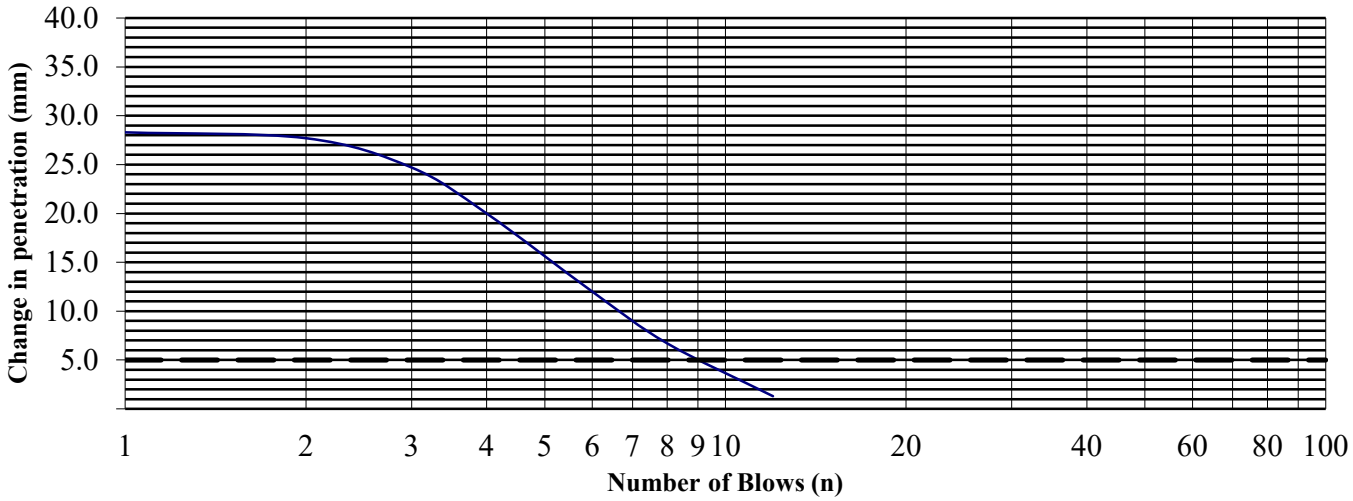
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP19**	**Top Depth (m):**	**1.75**
Sample Number:	**7**	**Base Depth (m):**	**2.00**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	2
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	111.7	28.3
2	97.6	27.7
3	89.1	24.7
4	83.4	20.0
6	75.3	12.0
8	69.9	6.7
12	64.4	1.3
16	63.4	
24	63.3	
32	63.2	
48	63.1	
64		
96		
128		
192		
256		

Test Results.

Moisture Content (%)	28
MCV	9.4

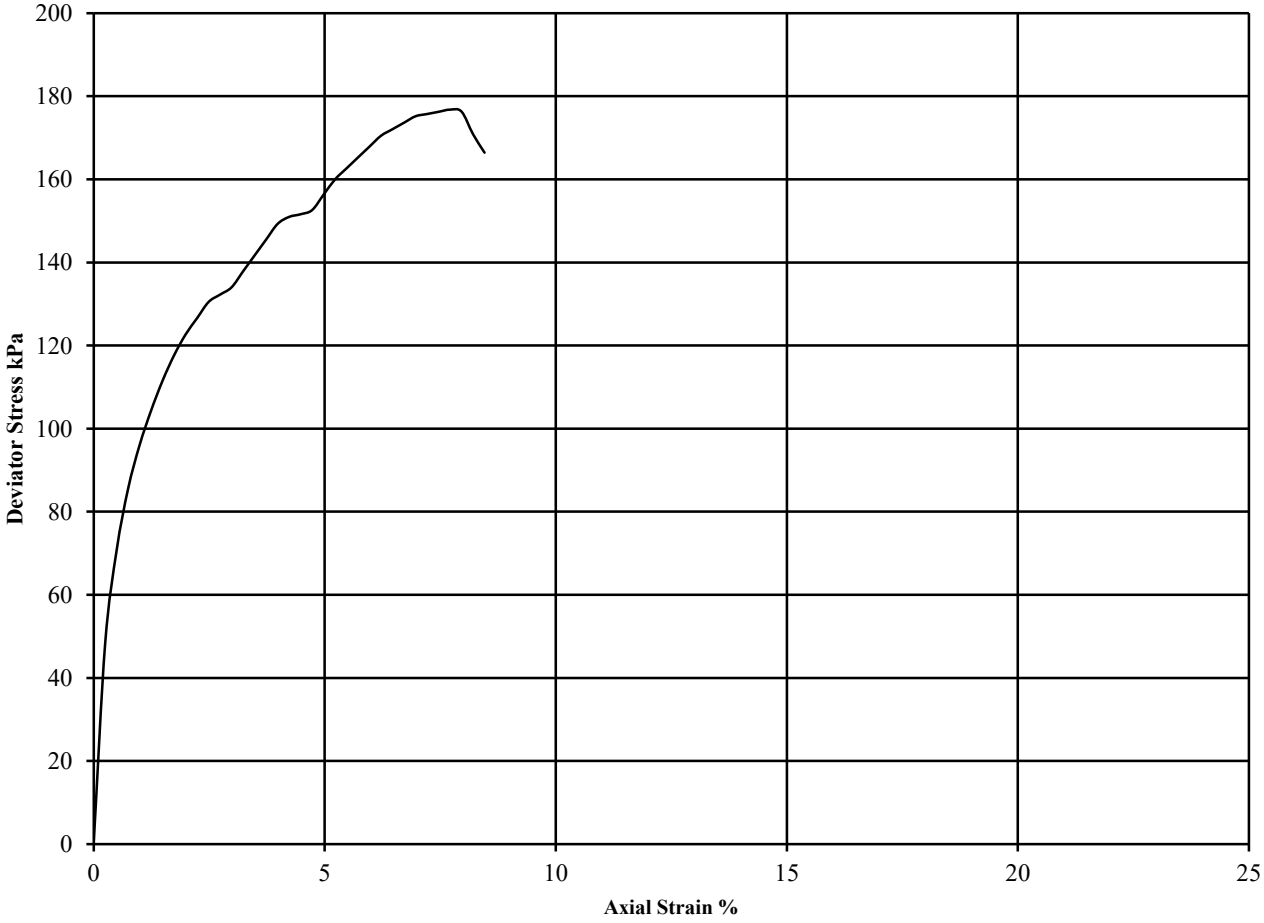
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Friday AD Plant**	**Contract No:** PSL19/1570 **Client Ref:** 4246

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**BH06B**	**Top Depth (m):**	**6.00**
Sample Number:	**16**	**Base Depth (m):**	**6.45**
Sample Type	**UT**		



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	23	2.10	1.71	100	134	67	3.0		0.36 0.36 0.35
				200	152	76	4.5		See summary of soil descriptions
				400	177	88	7.7	Brittle	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

Contract No:
PSL19/1570
Client Ref:
4246

ONE DIMENSIONAL CONSOLIDATION TEST

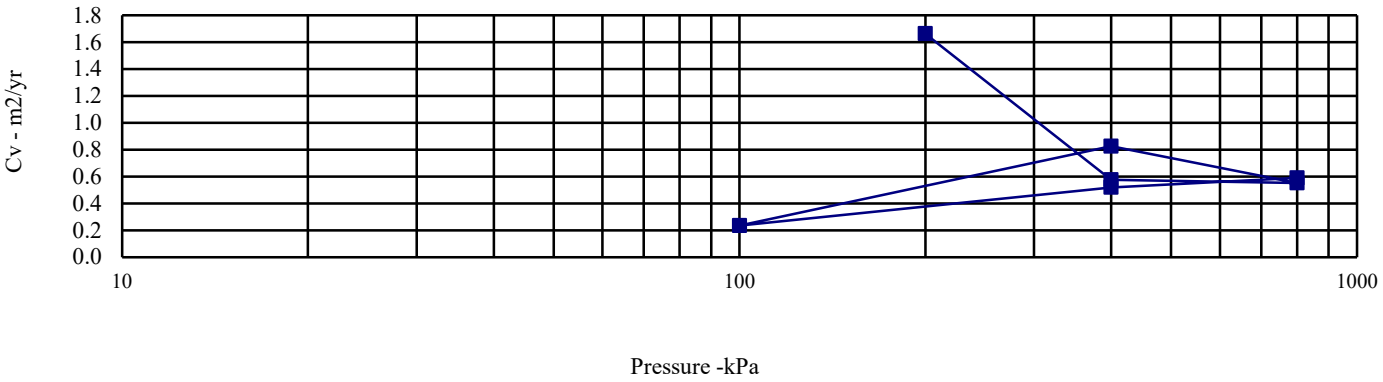
BS 1377: Part 5: 1990: Clause 3

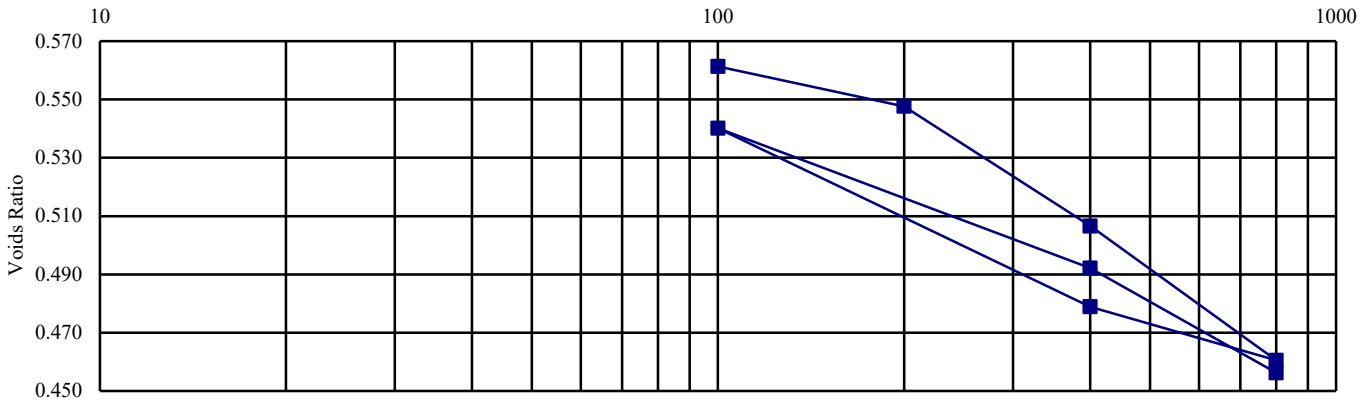
Hole Number: **BH06B** **Top Depth (m):** **6.00**

Sample Number: **16** **Base Depth (m) :** **6.45**

Sample Type: **UT**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	23						
Bulk Density (Mg/m3):	2.07	0	100	Swelling	Swelling	Method used to	
Dry Density (Mg/m3):	1.69	100	200	0.088	1.662	determine CV:	T90
Voids Ratio:	0.572	200	400	0.133	0.576	Nominal temperature	
Degree of saturation:	104.5	400	800	0.077	0.551	during test ' C:	20
Height (mm):	19.834	800	400	0.031	0.825	Remarks:	
Diameter (mm)	75.015	400	100	0.138	0.235	See summary of soil descriptions	
Particle Density (Mg/m3):	2.65	100	400	0.104	0.519		
Assumed		400	800	0.060	0.590		





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Fridays AD Plant**	**Contract No:** PSL19/1570 **Client Ref:** 4246

Certificate of Analysis

Certificate Number 19-04930

20-Mar-19

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

Our Reference 19-04930

Client Reference PSL19/1570

Order No (not supplied)

Contract Title Fridays AD Plant

Description 2 Soil samples.

Date Received 15-Mar-19

Date Started 15-Mar-19

Date Completed 20-Mar-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 19-04930
Client Ref PSL19/1570
Contract Title Fridays AD Plant

			Lab No	1474569	1474570
			Sample ID	TP12	TP18
			Depth	1.50	0.50
			Other ID	6	1
			Sample Type	D	D
			Sampling Date	n/s	n/s
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Metals					
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10
Inorganics					
pH	DETSC 2008#			8.4	7.8
Chloride Aqueous Extract	DETSC 2055	1	mg/l	10	5.4
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	27	13
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	94	19
Sulphur as S, Total	DETSC 2320	0.01	%	0.08	0.04
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.10	0.08

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

Information in Support of the Analytical Results

Our Ref 19-04930
Client Ref PSL19/1570
Contract Fridays AD Plant

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1474569	TP12 1.50 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), pH + Conductivity (7 days)	
1474570	TP18 0.50 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), 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

LABORATORY REPORT

4043

Contract Number: PSL19/1525

Report Date: 02 April 2019

Client's Reference: 4246-001

Client Name: Central Alliance
Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

For the attention of: Ben Haswell

Contract Title: Fridays AD Plant

Date Received: 6/3/2019
Date Commenced: 6/3/2019
Date Completed: 2/4/2019

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)	A Watkins (Director)	R Berriman (Quality Manager)
S Royle (Laboratory Manager)	S Eyre (Senior Technician)	L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH01		UT	2.50	2.95	Brown mottled grey CLAY.
BH01		UT	4.50	4.95	Brown CLAY.
BH01		B	7.50	7.95	Grey slightly gravelly slightly sandy very silty CLAY.
BH01		UT	10.50	10.95	Brown very sandy very silty CLAY.
BH04		D	2.00		Brown mottled grey CLAY.
BH04		D	3.00		Brown gravelly CLAY.
BH04		UT	4.50	4.95	Very stiff brown mottled grey CLAY.
BH04		D	7.00		Grey very silty CLAY.
BH05		D	1.20		Brown mottled grey slightly gravelly very silty CLAY.
BH05		UT	2.50	2.90	Firm brown mottled grey CLAY.
BH05		D	3.50	3.95	Brown mottled grey slightly gravelly CLAY.
BH05		D	4.00		Brown slightly gravelly CLAY.
BH05		UT	4.50	4.95	Brown mottled grey CLAY.
BH05		UT	8.00	8.45	Stiff grey CLAY.
BH06		D	0.60		Brown mottled grey slightly gravelly CLAY.
BH07		D	2.00		Brown mottled grey slightly gravelly CLAY.
BH07		D	4.00		Brown mottled grey slightly gravelly CLAY.
BH07		UT	6.00	6.45	Stiff 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
BH01		UT	2.50	2.95	31			79	31	48	100	Very high plasticity CV.
BH01		UT	4.50	4.95	28			71	29	42	100	Very high plasticity CV.
BH01		B	7.50	7.95	20							
BH01		UT	10.50	10.95	14			37	22	15	100	Intermediate plasticity CI.
BH04		D	2.00		34							
BH04		D	3.00		31							
BH04		UT	4.50	4.95	19			56	25	31	100	High plasticity CH.
BH04		D	7.00		24							
BH05		D	1.20		25							
BH05		UT	2.50	2.90	31			69	30	39	100	High plasticity CH.
BH05		D	3.50	3.95	21							
BH05		D	4.00		24							
BH05		UT	4.50	4.95	16			39	19	20	100	Intermediate plasticity CI.
BH05		UT	8.00	8.45	20							
BH06		D	0.60		30							
BH07		D	2.00		26							
BH07		D	4.00		26							
BH07		UT	6.00	6.45	17			50	24	26	100	Intermediate plasticity CI.

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

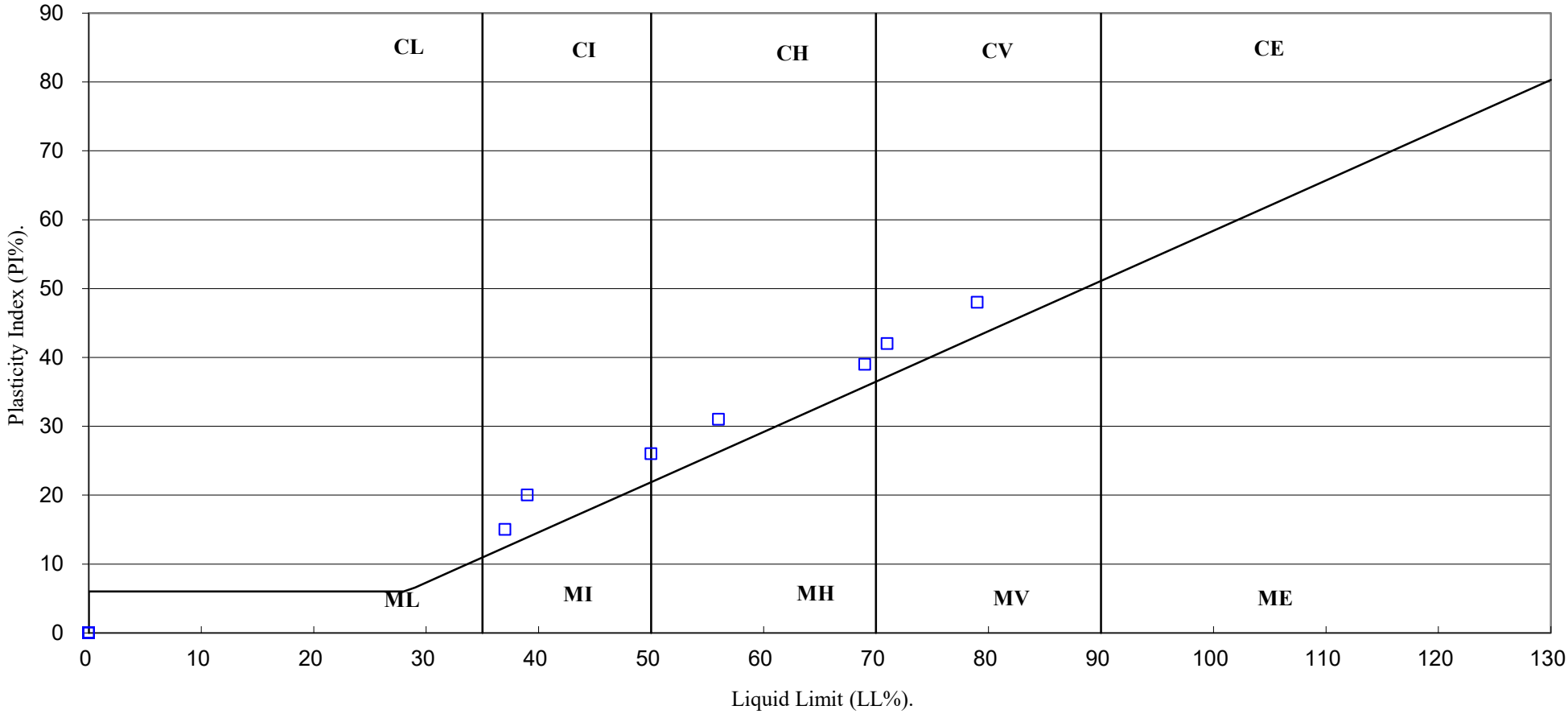
UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

Contract No:
PSL19/1525
Client Ref:
4246

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Fridays AD Plant	Contract No: PSL19/1525 Client Ref: 4246

PARTICLE SIZE DISTRIBUTION TEST

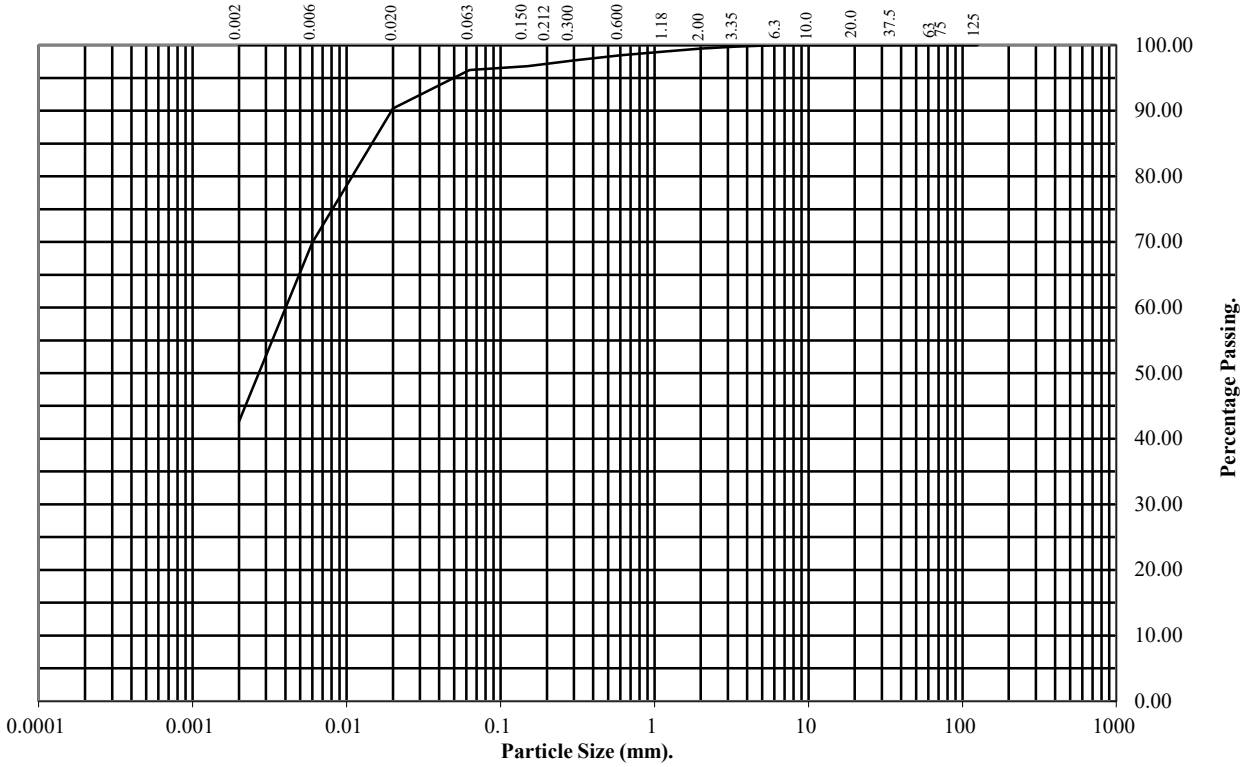
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **BH01** **Top Depth (m):** **7.50**

Sample Number: **Base Depth(m):** **7.95**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	99
0.6	98
0.3	98
0.212	97
0.15	97
0.063	96

Particle Diameter	Percentage Passing
0.02	90
0.006	70
0.002	43

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	3
Silt	53
Clay	43

Remarks:
See Summary of Soil Descriptions

ONE DIMENSIONAL CONSOLIDATION TEST

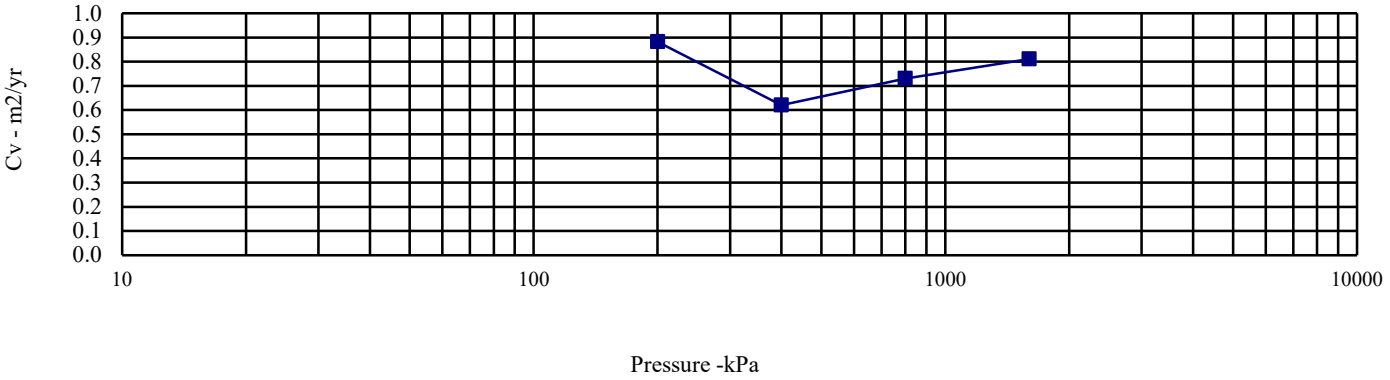
BS 1377: Part 5: 1990: Clause 3

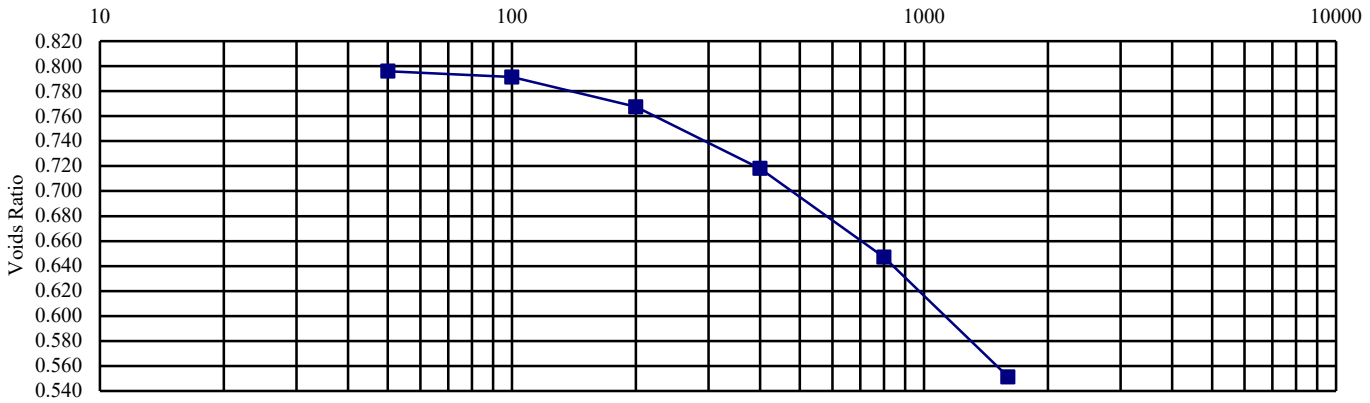
Hole Number: **BH01** **Top Depth (m):** **2.50**

Sample Number: **Base Depth (m) :** **2.95**

Sample Type: **UT**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	30						
Bulk Density (Mg/m3):	1.92	0	50	Swelling	Swelling	Method used to	
Dry Density (Mg/m3):	1.47	50	100	Swelling	Swelling	determine CV:	T90
Voids Ratio:	0.801	100	200	0.133	0.882	Nominal temperature	
Degree of saturation:	99.9	200	400	0.139	0.620	during test ' C:	20
Height (mm):	19.84	400	800	0.103	0.730	Remarks:	
Diameter (mm)	75.06	800	1600	0.073	0.811	See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Fridays AD Plant**	**Contract No:** PSL19/1525 **Client Ref:** 4246

ONE DIMENSIONAL CONSOLIDATION TEST

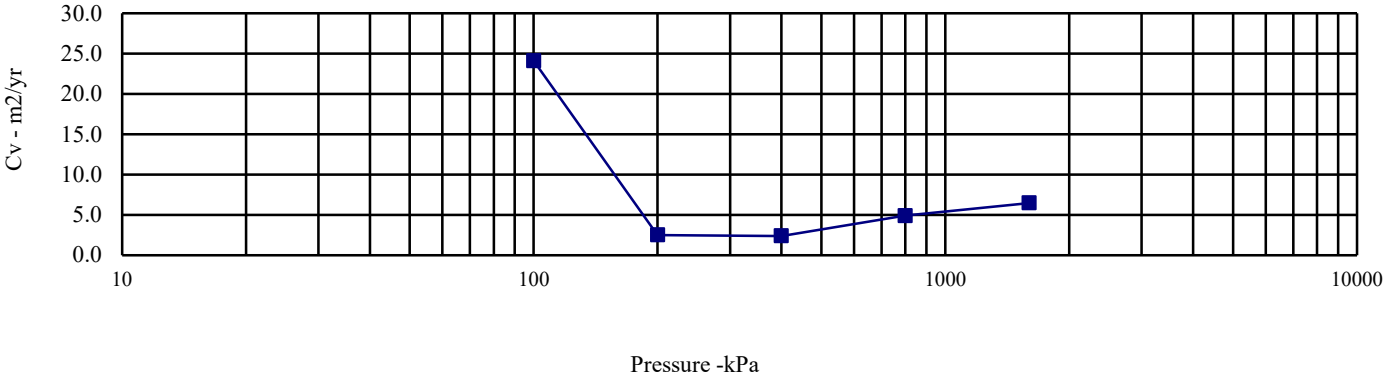
BS 1377: Part 5: 1990: Clause 3

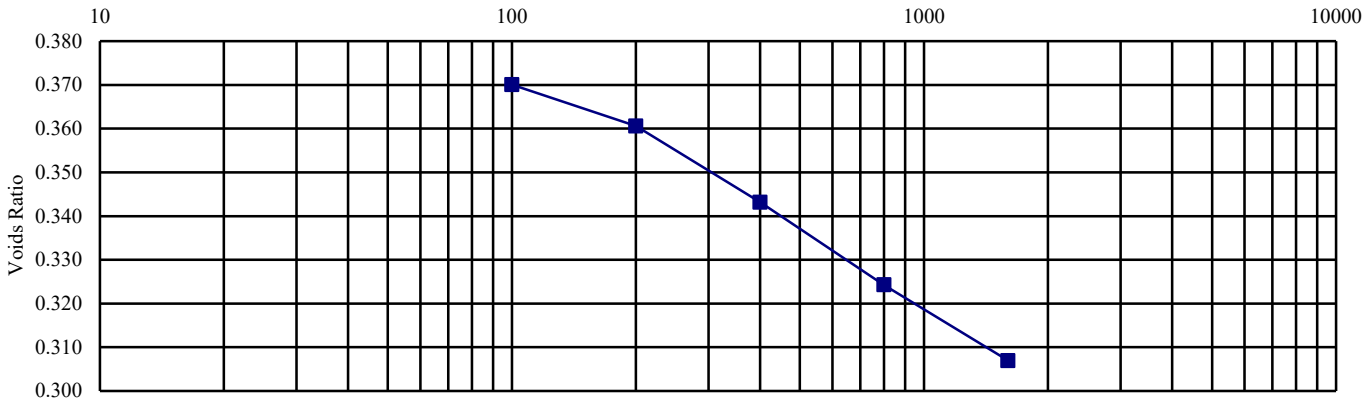
Hole Number: **BH01** **Top Depth (m):** **10.50**

Sample Number: **Base Depth (m) :** **10.95**

Sample Type: **UT**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	14						
Bulk Density (Mg/m3):	2.19	0	100	0.065	24.114	Method used to	
Dry Density (Mg/m3):	1.92	100	200	0.069	2.506	determine CV:	T90
Voids Ratio:	0.379	200	400	0.064	2.383	Nominal temperature	
Degree of saturation:	95.9	400	800	0.035	4.890	during test ' C:	20
Height (mm):	19.954	800	1600	0.016	6.462	Remarks:	
Diameter (mm)	75.01					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Fridays AD Plant**	**Contract No:** PSL19/1525 **Client Ref:** 4246

ONE DIMENSIONAL CONSOLIDATION TEST

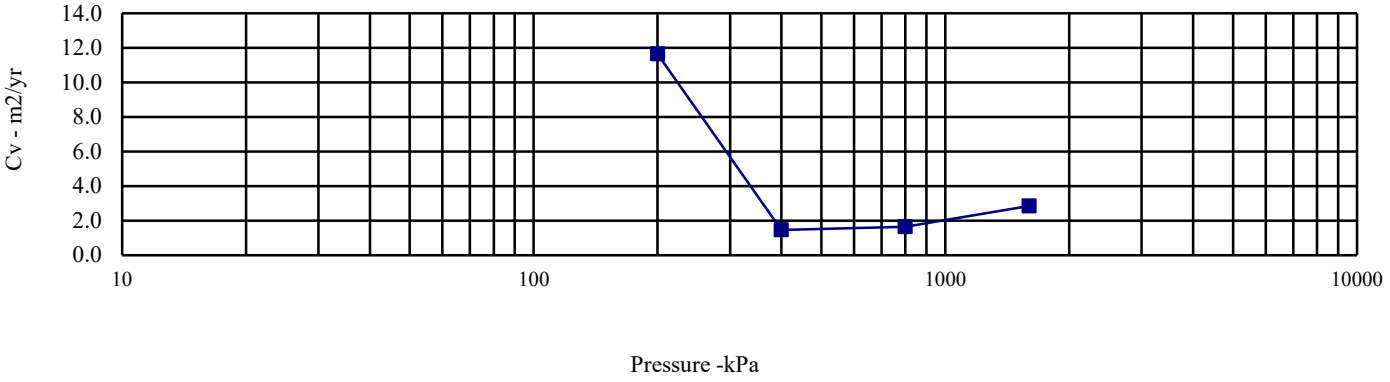
BS 1377: Part 5: 1990: Clause 3

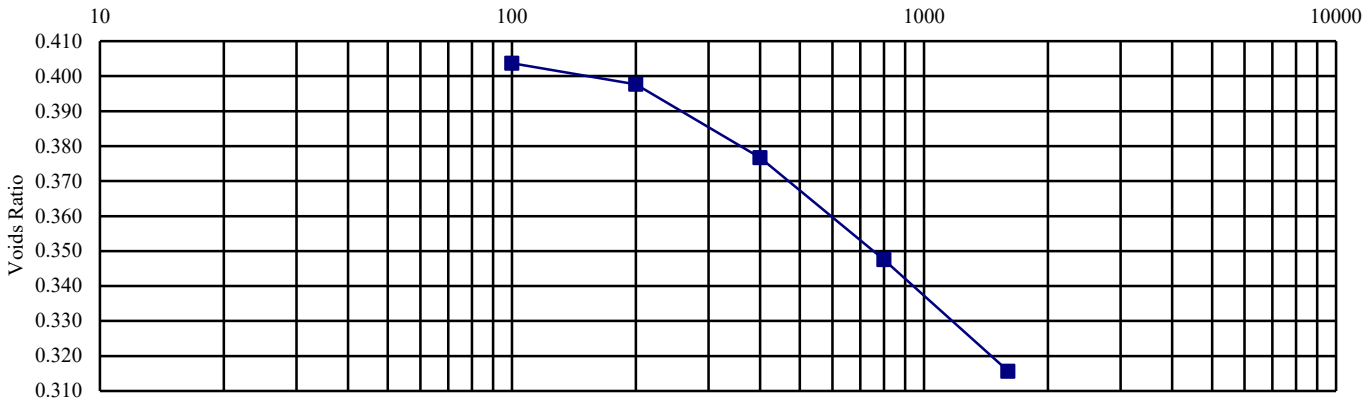
Hole Number: **BH05** **Top Depth (m):** **4.50**

Sample Number: **Base Depth (m) :** **4.95**

Sample Type: **UT**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	15						
Bulk Density (Mg/m3):	2.16	0	100	Swelling	Swelling	Method used to	
Dry Density (Mg/m3):	1.88	100	200	0.043	11.653	determine CV:	T90
Voids Ratio:	0.410	200	400	0.075	1.458	Nominal temperature	
Degree of saturation:	98.0	400	800	0.053	1.637	during test ' C:	20
Height (mm):	20.36	800	1600	0.030	2.839	Remarks:	
Diameter (mm)	75.145					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





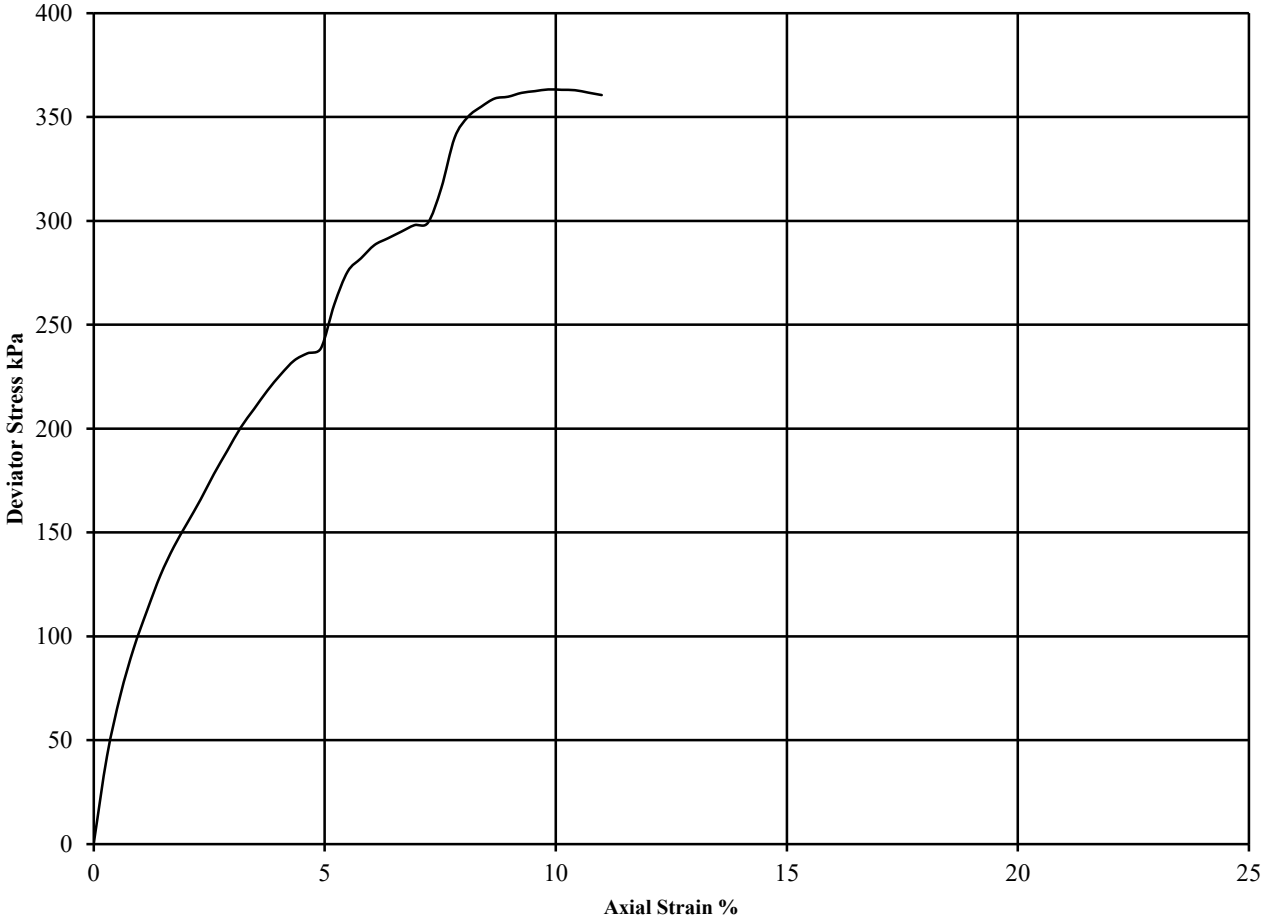
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Fridays AD Plant**	**Contract No:** PSL19/1525 **Client Ref:** 4246

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**BH04**	**Top Depth (m):**	**4.50**
Sample Number:		**Base Depth (m):**	**4.95**
Sample Type	**UT**		



Diameter (mm):		103	Height (mm):		178	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	19	2.13	1.79	50	239	119	4.9		0.36 0.36 0.35
				100	299	150	7.2		See summary of soil descriptions
				200	363	182	9.8	Brittle	

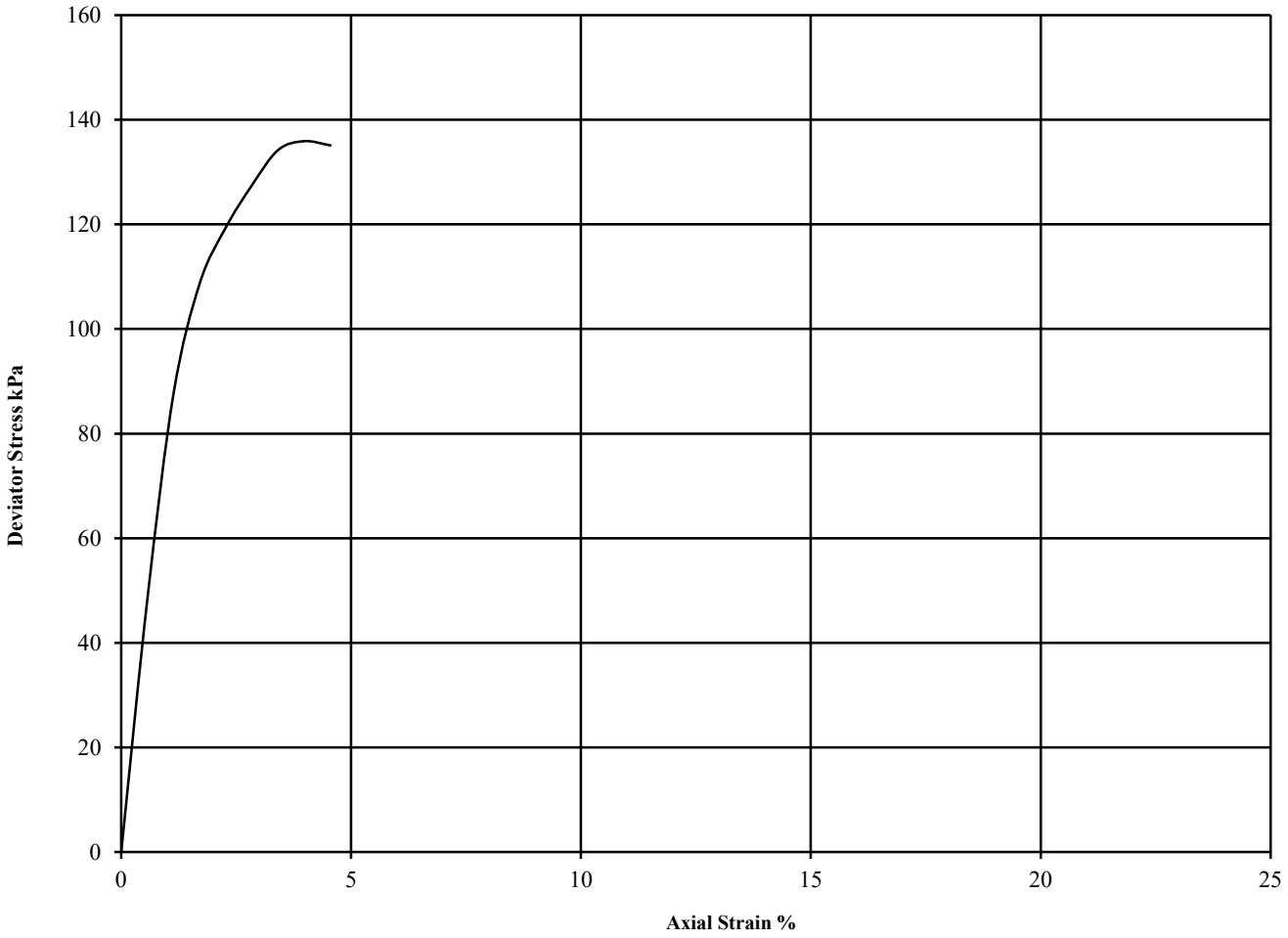
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Fridays AD Plant**	**Contract No:** PSL19/1525 **Client Ref:** 4246

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH05**	**Top Depth (m):**	**2.50**
Sample Number:		**Base Depth (m):**	**2.90**
Sample Type	**UT**		



Diameter (mm):		95	Height (mm):		167	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 0.39
1	31	1.88	1.43	50	136	68	4.0	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

Contract No:
PSL19/1525
Client Ref:
4246

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

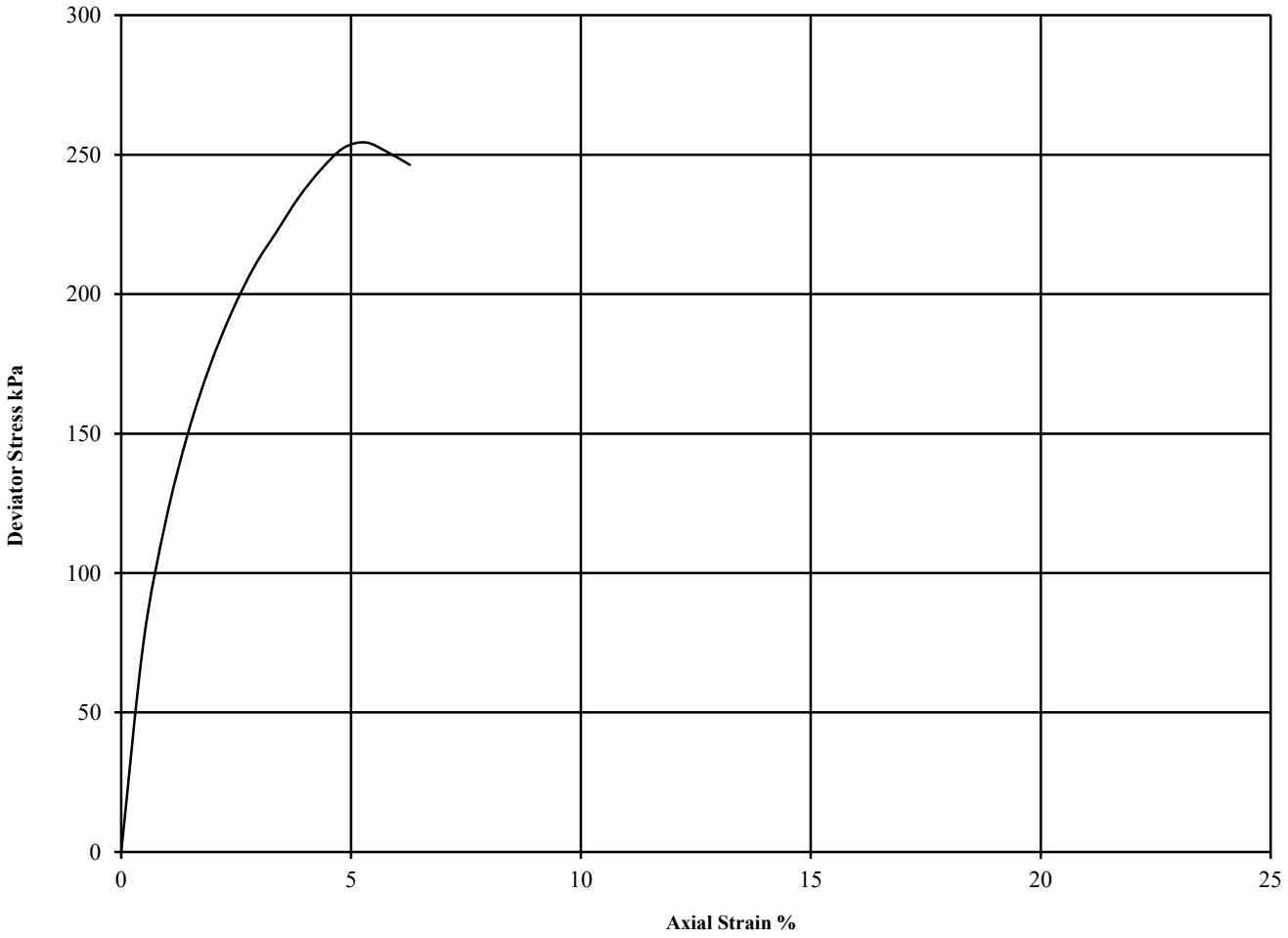
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: BH05 **Top Depth (m):** 8.00

Sample Number: **Base Depth (m):** 8.45

Sample Type UT



Diameter (mm):		100	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 0.37
1	20	2.14	1.79	100	254	127	5.3	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

Contract No: PSL19/1525

Client Ref: 4246

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

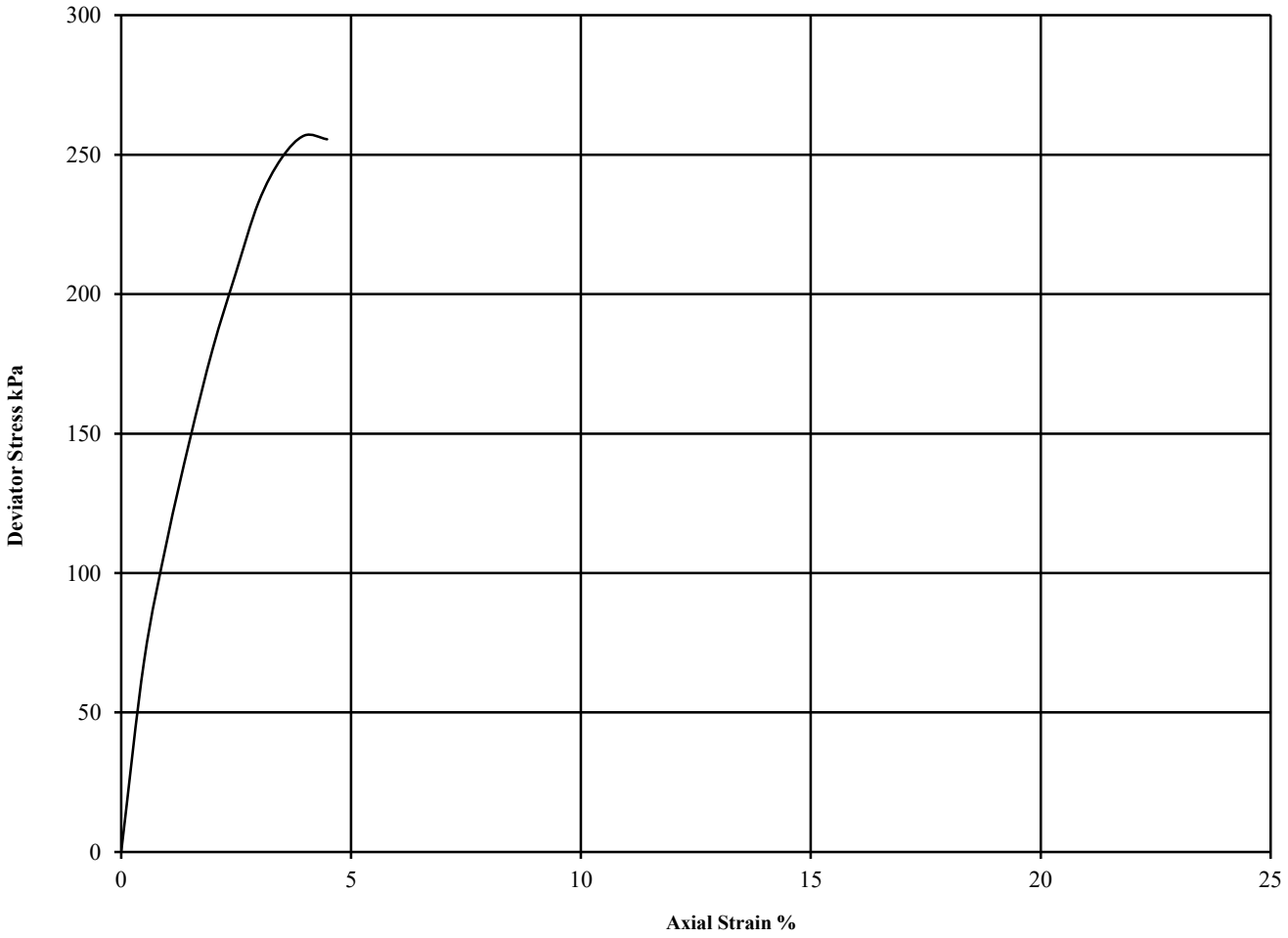
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: BH07 **Top Depth (m):** 6.00

Sample Number: **Base Depth (m):** 6.45

Sample Type UT



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 0.36
1	17	2.15	1.84	100	257	128	4.0	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

Contract No: PSL19/1525

Client Ref: 4246

Certificate of Analysis

Certificate Number	19-04575
	15-Mar-19
Client	Professional Soils Laboratory Ltd 5/7 Hexthorpe Road Hexthorpe DN4 0AR
Our Reference	19-04575
Client Reference	PSL19/1525
Order No	(not supplied)
Contract Title	Friday AD Plant
Description	One Soil sample.
Date Received	11-Mar-19
Date Started	11-Mar-19
Date Completed	15-Mar-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 19-04575
Client Ref PSL19/1525
Contract Title Friday AD Plant

Lab No	1472298
Sample ID	BH01
Depth	5.00
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	160
Inorganics				
pH	DETSC 2008#			8.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	44
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	3.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	170
Sulphur as S, Total	DETSC 2320	0.01	%	0.05
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.04

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

Information in Support of the Analytical Results

Our Ref 19-04575
Client Ref PSL19/1525
Contract Friday AD Plant

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1472298	BH01 5.00 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), 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

LABORATORY REPORT

4043

Contract Number: PSL19/1732

Report Date: 10 April 2019

Client's Reference: 4246-003

Client Name: Central Alliance
Alliance House
South Park Way
Wakefield 41 Business Park
Wakefield
WF2 0XJ

For the attention of: Ben Haswell

Contract Title: Fridays AD Plant

Date Received: 15/3/2019
Date Commenced: 15/3/2019
Date Completed: 10/4/2019

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

S Royle (Laboratory Manager)
S Eyre (Senior Technician)
L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP01	2	D	0.50		Brown slightly gravelly slightly sandy CLAY.
TP01	9	B	1.00	2.00	Brown mottled grey CLAY.
TP01	11	B	2.70	3.20	Brown mottled grey CLAY.
TP01	12	B	3.30	4.00	Brown slightly sandy CLAY.
TP02	2	D	0.50		Brown slightly sandy CLAY.
TP02	8	B	0.90	1.80	Brown mottled grey sandy CLAY.
TP02	9	D	2.00		Brown slightly gravelly sandy CLAY.
TP02	11	B	3.00	4.00	Brown very clayey GRAVEL with cobbles.
TP03	2	D	0.50		Brown slightly gravelly sandy CLAY.
TP03	8	B	1.20	2.00	Dark brown slightly gravelly slightly sandy CLAY.
TP03	9	D	2.50		Brown mottled grey slightly sandy CLAY.
TP03	11	B	2.80	3.30	Brown mottled grey CLAY.
TP03	12	B	3.50	4.20	Brown mottled grey CLAY.
TP04	6	B	0.60	0.90	Brown slightly gravelly sandy CLAY.
TP04	9	B	1.00	2.00	Brown mottled grey CLAY.
TP04	10	D	2.50		Brown slightly gravelly sandy CLAY.
TP04	12	D	3.80		Brown mottled grey CLAY.
TP05	4	D	0.50		Brown slightly sandy CLAY.
TP05	6	D	1.00		Brown mottled grey slightly sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP05	10	D	1.70		Brown gravelly sandy CLAY.
TP05	12	B	2.00	2.60	Brown mottled grey slightly gravelly slightly sandy CLAY.
TP05	13	D	2.80		Brown mottled grey slightly sandy CLAY
TP05	15	B	3.60	4.20	Brown CLAY.
TP06	2	D	0.50		Brown slightly gravelly sandy CLAY.
TP06	4	D	1.00		Brown slightly gravelly sandy CLAY.
TP06	11	B	2.00	3.50	Brown mottled grey CLAY.
TP06	12	B	3.90	4.20	Brown mottled grey CLAY.
TP07	2	D	0.50		Brown slightly gravelly slightly sandy CLAY.
TP07	6	B	0.65	0.90	Brown mottled grey CLAY.
TP07	9	B	1.00	2.00	Grey mottled brown slightly gravelly CLAY.
TP07	10	D	2.50		Brown mottled grey CLAY.
TP07	14	B	4.00	4.50	Brown mottled grey CLAY.
TP08A	2	B	0.20	0.50	Brown very gravelly sandy CLAY.
TP20	4	B	0.00	1.70	Brown slightly gravelly slightly sandy CLAY.
TP21	4	D	1.90		Brown slightly sandy 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	2	D	0.50		20							
TP01	9	B	1.00	2.00	22			51	23	28	100	High plasticity CH.
TP01	11	B	2.70	3.20	21							
TP01	12	B	3.30	4.00	25							
TP02	2	D	0.50		26							
TP02	8	B	0.90	1.80	25							
TP02	9	D	2.00		25							
TP02	11	B	3.00	4.00	19							
TP03	2	D	0.50		27							
TP03	8	B	1.20	2.00	27							
TP03	9	D	2.50		27							
TP03	11	B	2.80	3.30	24							
TP03	12	B	3.50	4.20	20							
TP04	6	B	0.60	0.90	20							
TP04	9	B	1.00	2.00	22			52	24	28	100	High plasticity CH.
TP04	10	D	2.50		27							
TP04	12	D	3.80		24							
TP05	4	D	0.50		23							
TP05	6	D	1.00		23							

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

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

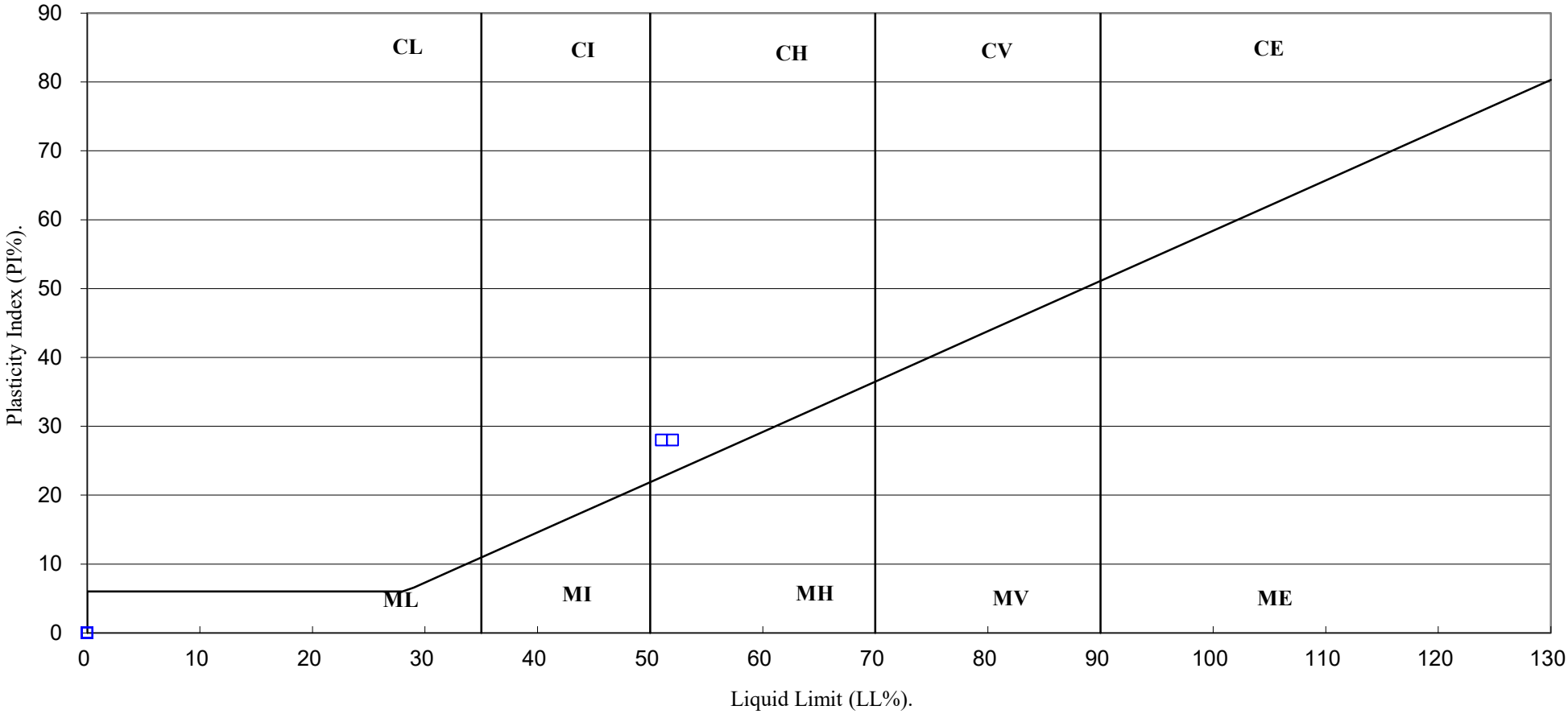
Contract No:

PSL19/1732

Client Ref:

4246

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Fridays AD Plant	Contract No: PSL19/1732 Client Ref: 4246

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
TP05	10	D	1.70		23							
TP05	12	B	2.00	2.60	22			53	24	29	98	High plasticity CH.
TP05	13	D	2.80		25							
TP05	15	B	3.60	4.20	18							
TP06	2	D	0.50		27							
TP06	4	D	1.00		23							
TP06	11	B	2.00	3.50	26			70	26	44	100	Very high plasticity CV.
TP06	12	B	3.90	4.20	18							
TP07	2	D	0.50		22							
TP07	6	B	0.65	0.90	19							
TP07	9	B	1.00	2.00	28			57	25	32	99	High plasticity CH.
TP07	10	D	2.50		24							
TP07	14	B	4.00	4.50	19							
TP08A	2	B	0.20	0.50	21			45	23	22	38	Intermediate plasticity CI.
TP20	4	B	0.00	1.70	27							
TP21	4	D	1.90		32							

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

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

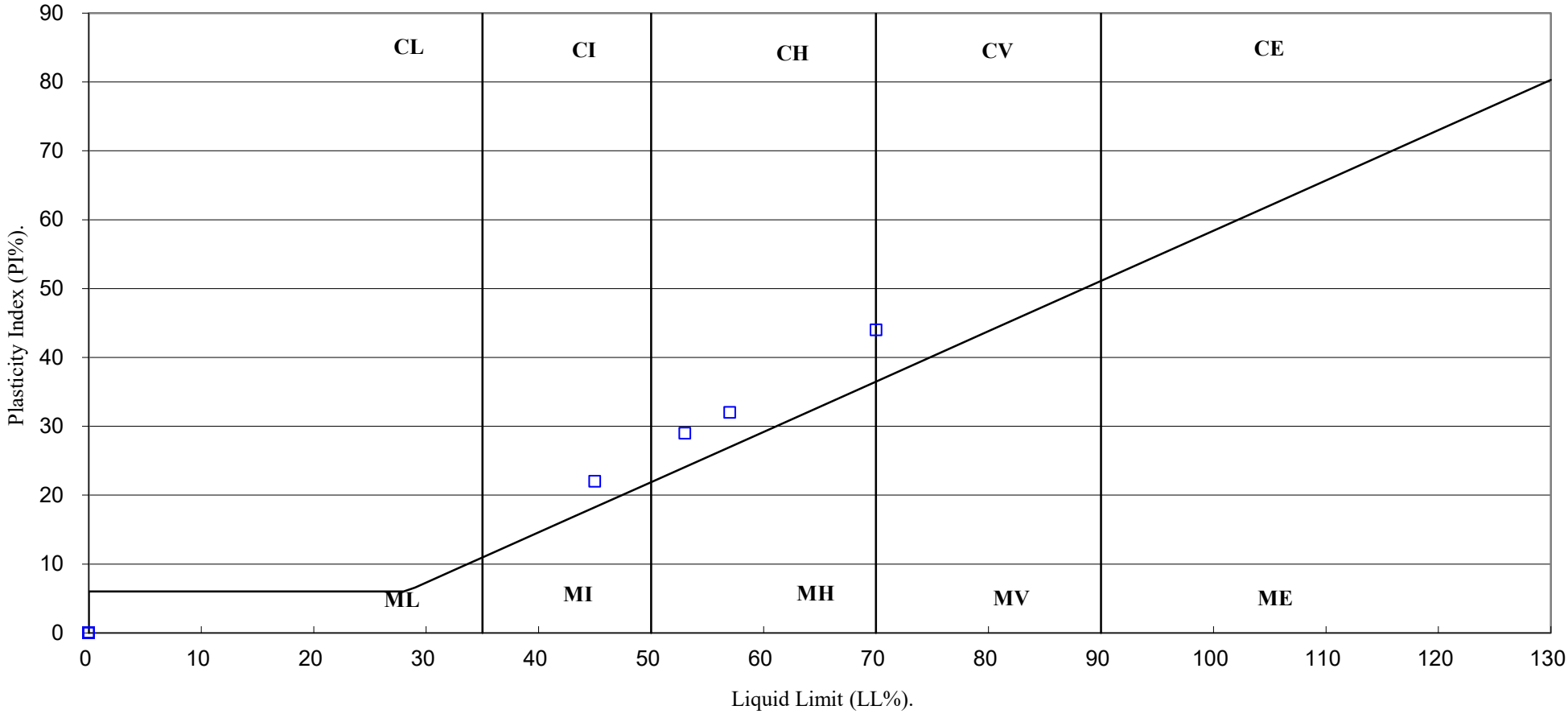
Contract No:

PSL19/1732

Client Ref:

4246

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



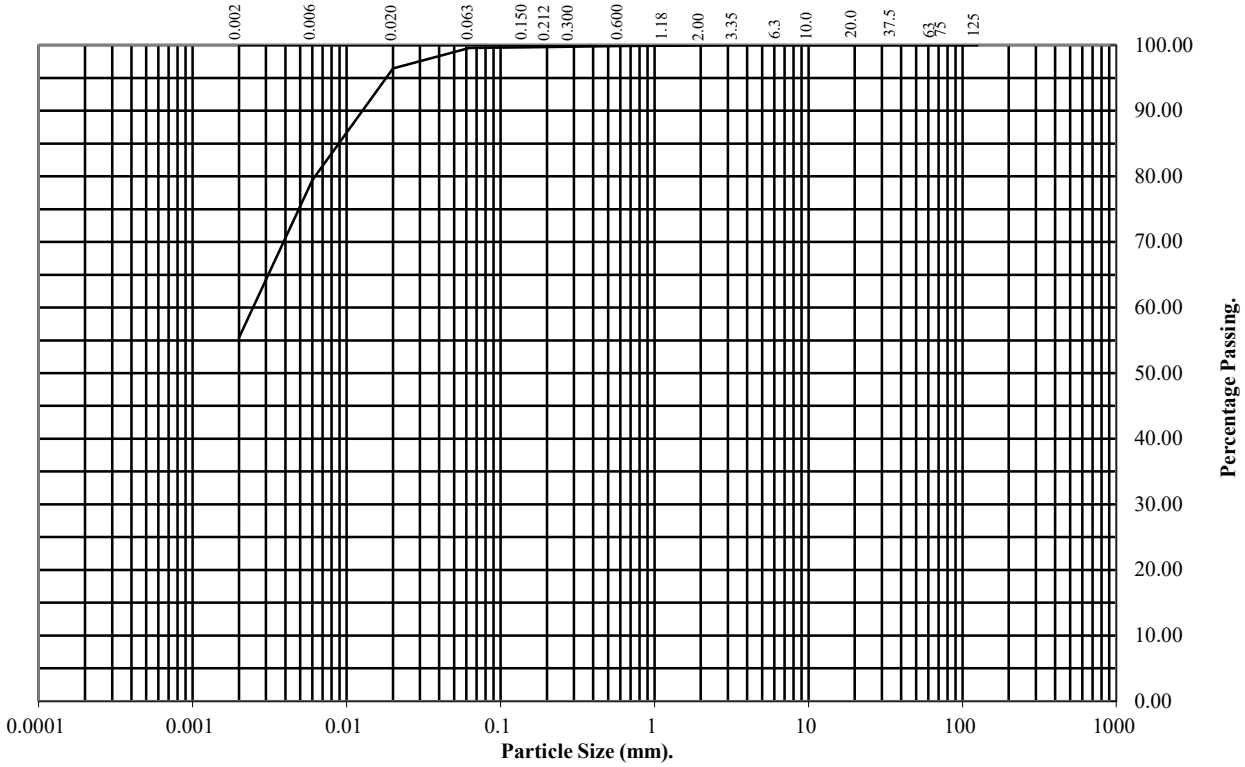
UKAS TESTING 4043	PSL Professional Soils Laboratory	Fridays AD Plant	Contract No: PSL19/1732 Client Ref: 4246

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP01**	**Top Depth (m):**	**1.00**
Sample Number:	**9**	**Base Depth(m):**	**2.00**
Sample Type:	**B**		



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

Particle Diameter	Percentage Passing
0.02	96
0.006	79
0.002	55

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	0
Silt	45
Clay	55

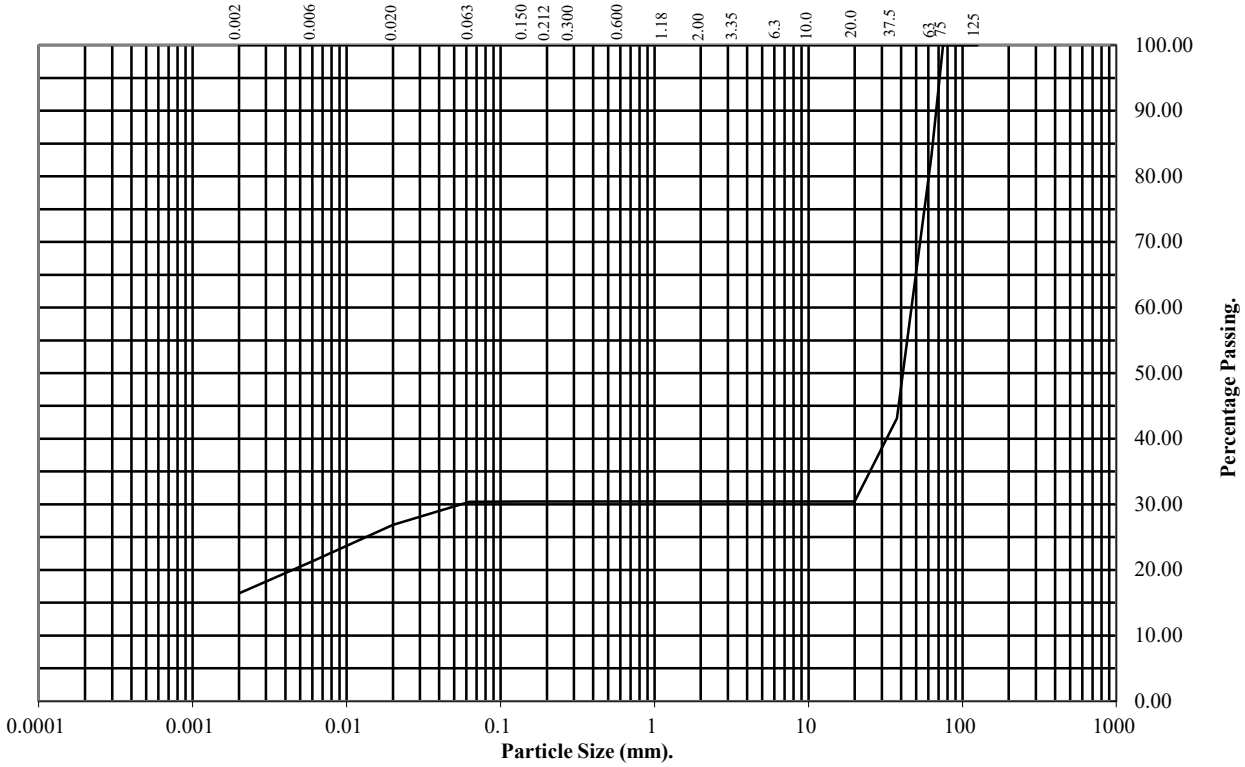
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP02**	**Top Depth (m):**	**3.00**
Sample Number:	**11**	**Base Depth(m):**	**4.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	83
37.5	43
20	30
10	30
6.3	30
3.35	30
2	30
1.18	30
0.6	30
0.3	30
0.212	30
0.15	30
0.063	30

Particle Diameter	Percentage Passing
0.02	27
0.006	21
0.002	16

Soil Fraction	Total Percentage
Cobbles	17
Gravel	53
Sand	0
Silt	14
Clay	16

Remarks:

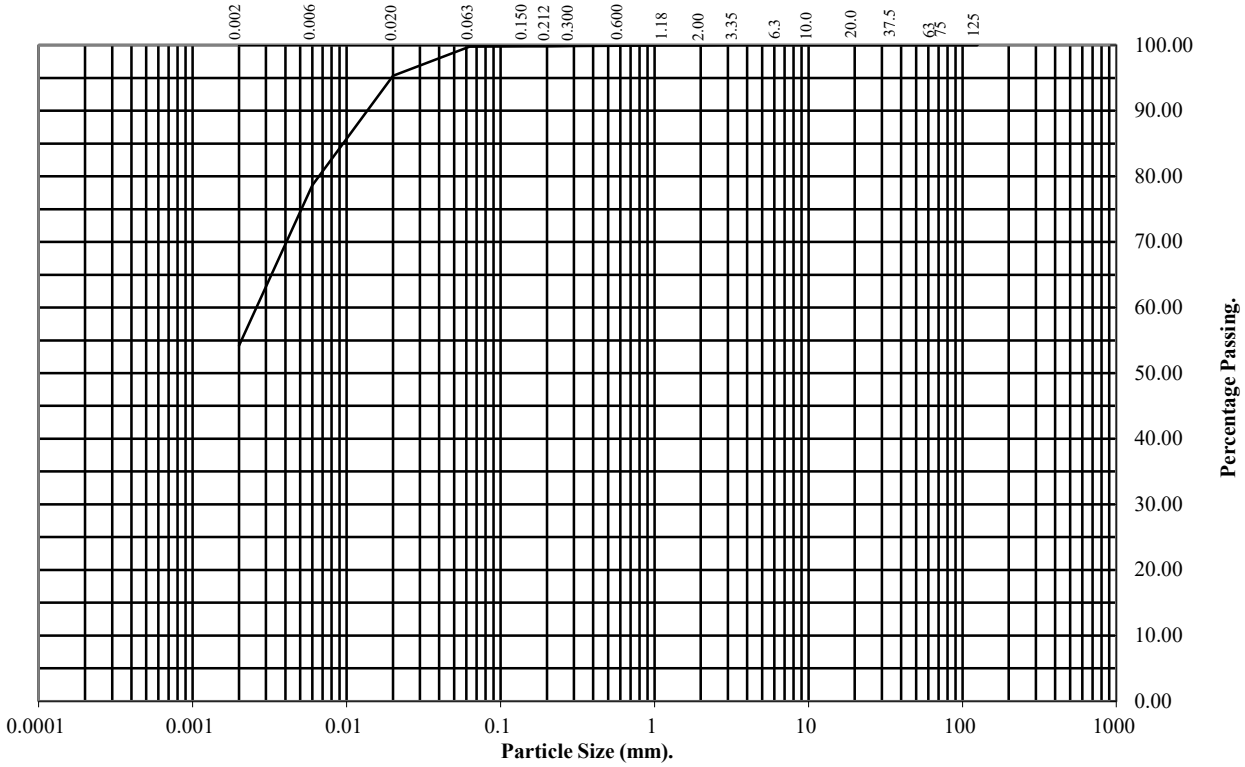
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP04**	**Top Depth (m):**	**1.00**
Sample Number:	**9**	**Base Depth(m):**	**2.00**
Sample Type:	**B**		



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

Particle Diameter	Percentage Passing
0.02	95
0.006	79
0.002	54

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	0
Silt	46
Clay	54

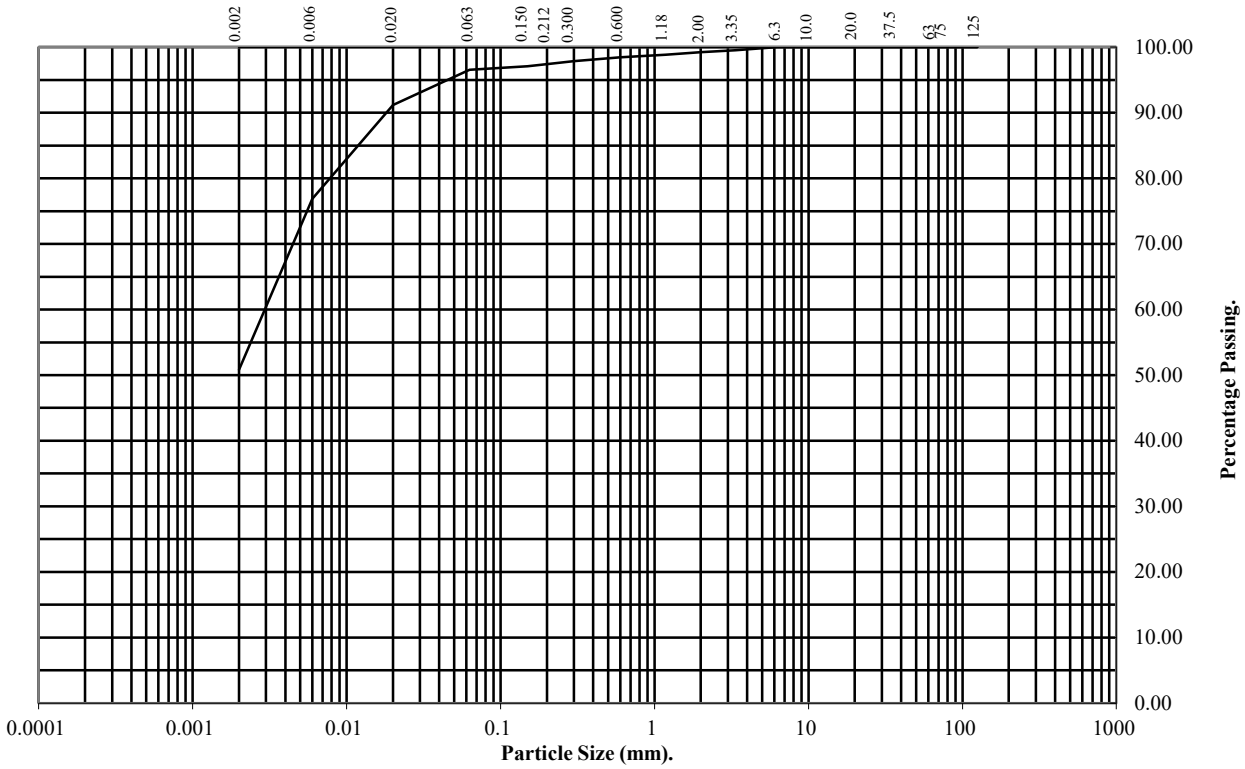
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP05**	**Top Depth (m):**	**2.00**
Sample Number:	**12**	**Base Depth(m):**	**2.60**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	99
0.6	98
0.3	98
0.212	97
0.15	97
0.063	97

Particle Diameter	Percentage Passing
0.02	91
0.006	77
0.002	51

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	2
Silt	46
Clay	51

Remarks:

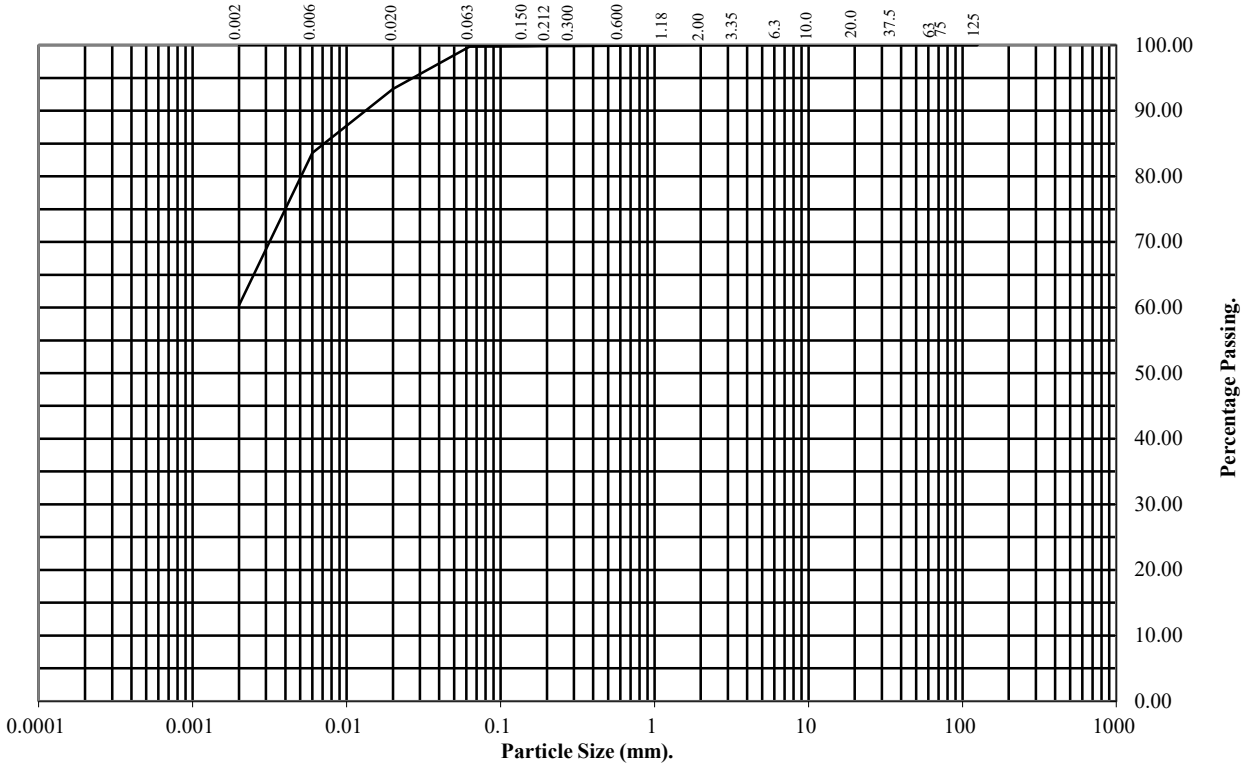
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP06**	**Top Depth (m):**	**2.00**
Sample Number:	**11**	**Base Depth(m):**	**3.50**
Sample Type:	**B**		



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

Particle Diameter	Percentage Passing
0.02	93
0.006	84
0.002	60

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	0
Silt	40
Clay	60

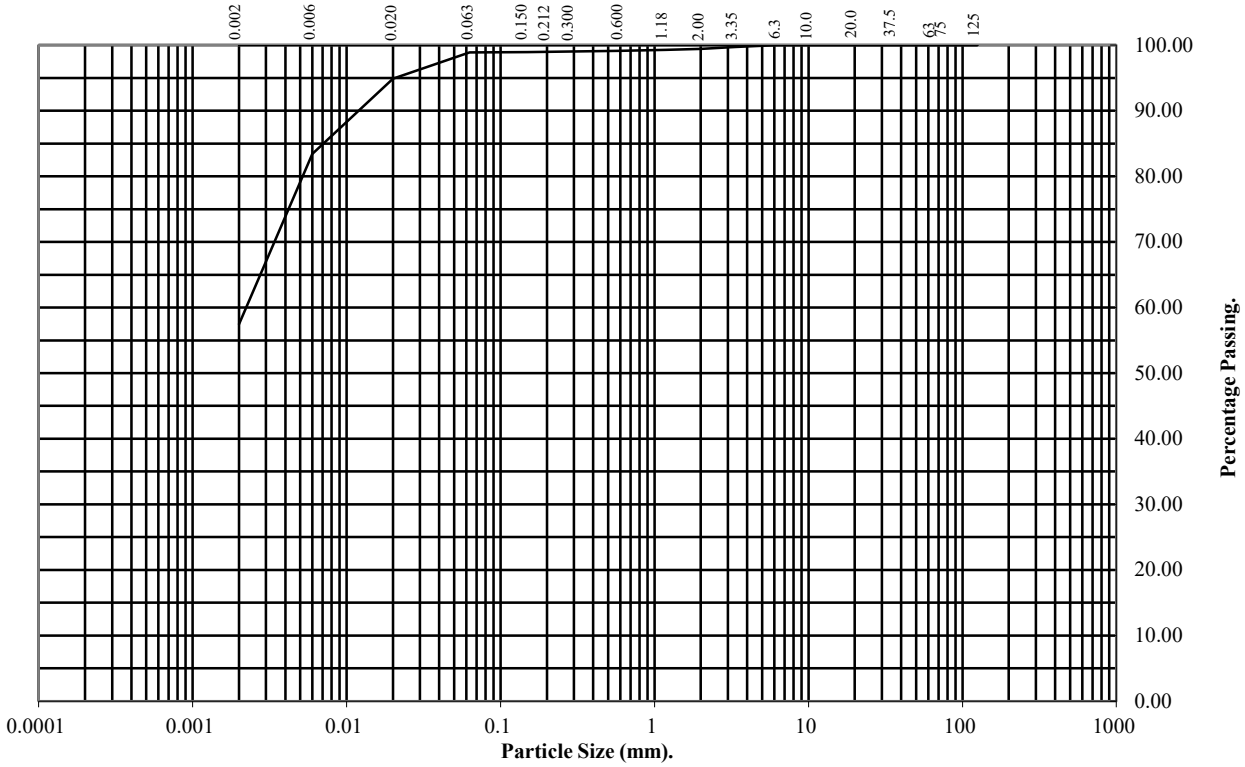
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP07**	**Top Depth (m):**	**1.00**
Sample Number:	**9**	**Base Depth(m):**	**2.00**
Sample Type:	**B**		



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

Particle Diameter	Percentage Passing
0.02	95
0.006	83
0.002	57

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	0
Silt	42
Clay	57

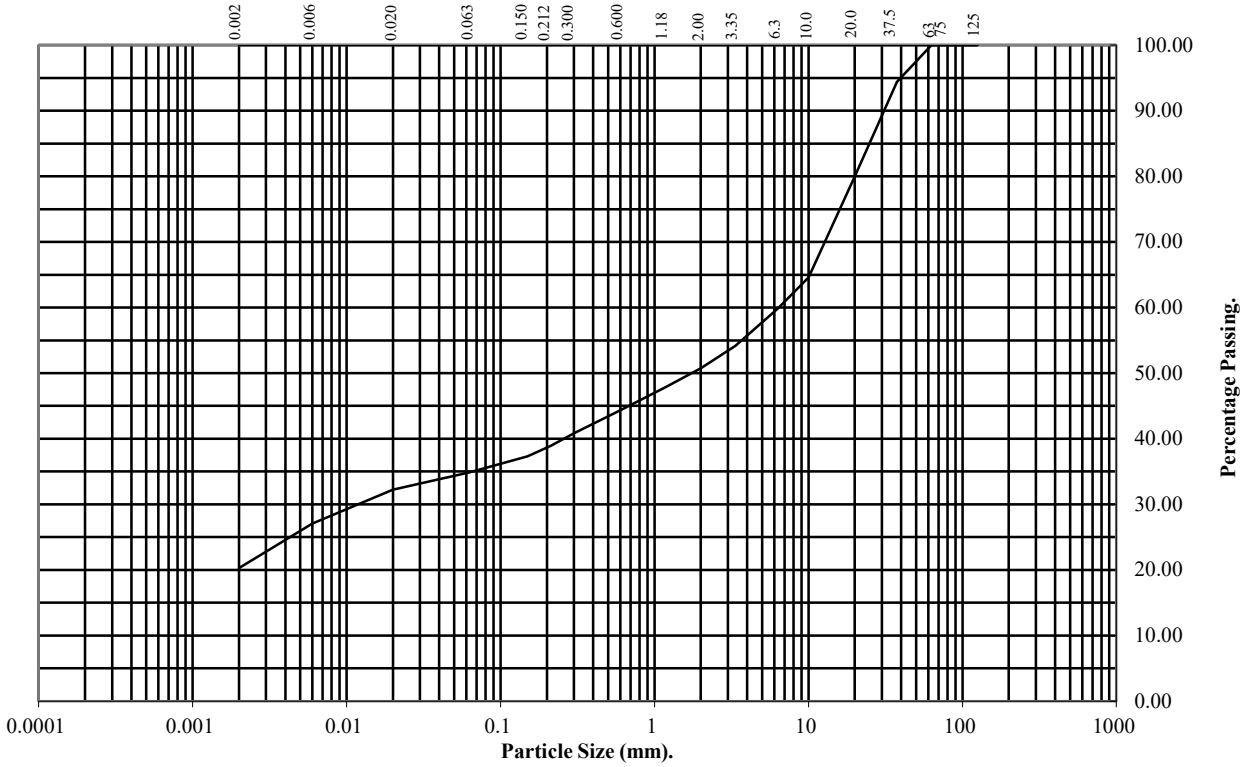
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**TP08A**	**Top Depth (m):**	**0.20**
Sample Number:	**2**	**Base Depth(m):**	**0.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	94
20	80
10	65
6.3	60
3.35	54
2	51
1.18	48
0.6	44
0.3	41
0.212	39
0.15	37
0.063	35

Particle Diameter	Percentage Passing
0.02	32
0.006	27
0.002	20

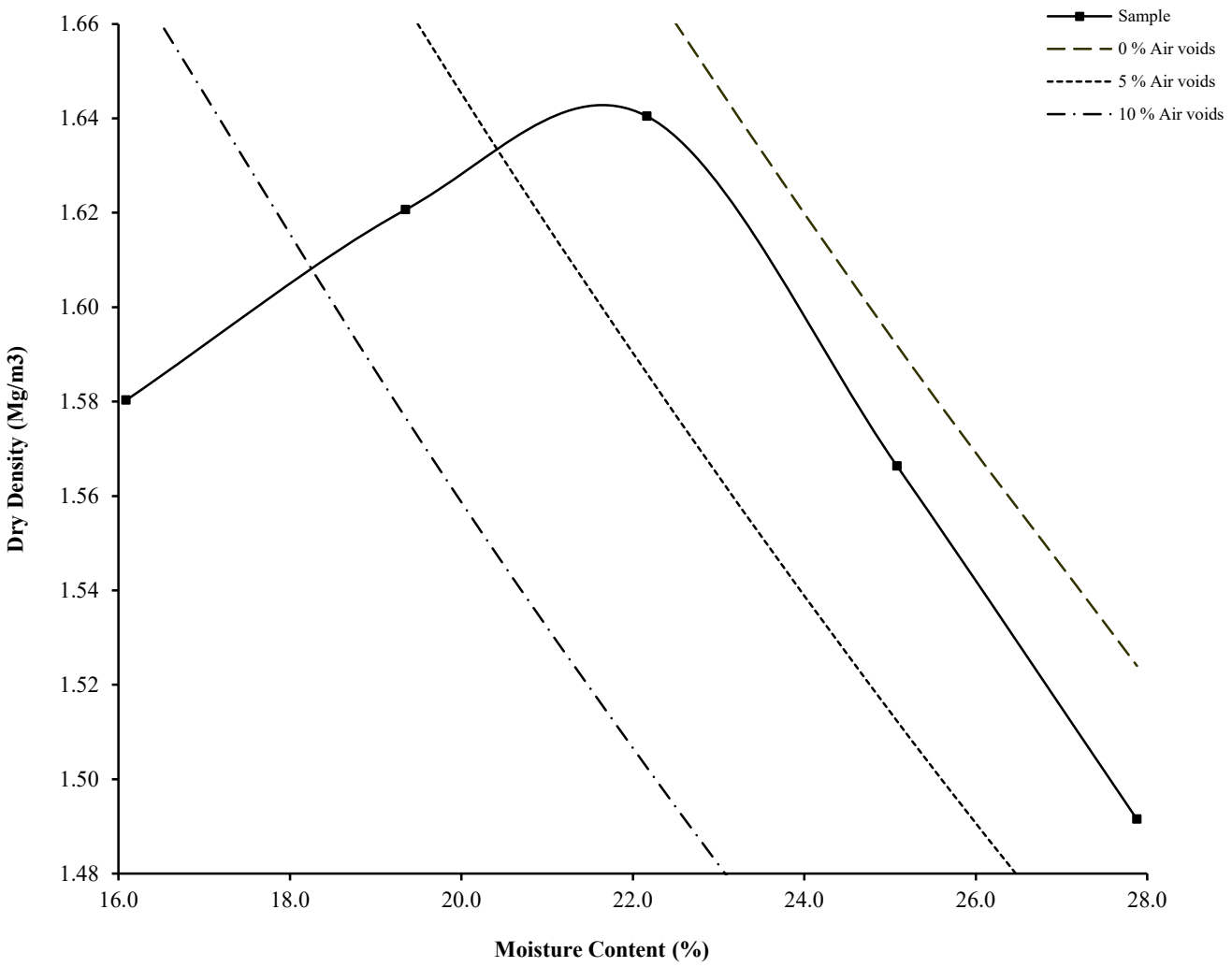
Soil Fraction	Total Percentage
Cobbles	0
Gravel	49
Sand	16
Silt	15
Clay	20

Remarks:
See Summary of Soil Descriptions

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : 1990

Hole Number:	**TP02**	**Top Depth (m) :**	**3.00**
Sample Number:	**11**	**Base Depth (m) :**	**4.00**
Sample Type:	**B**		

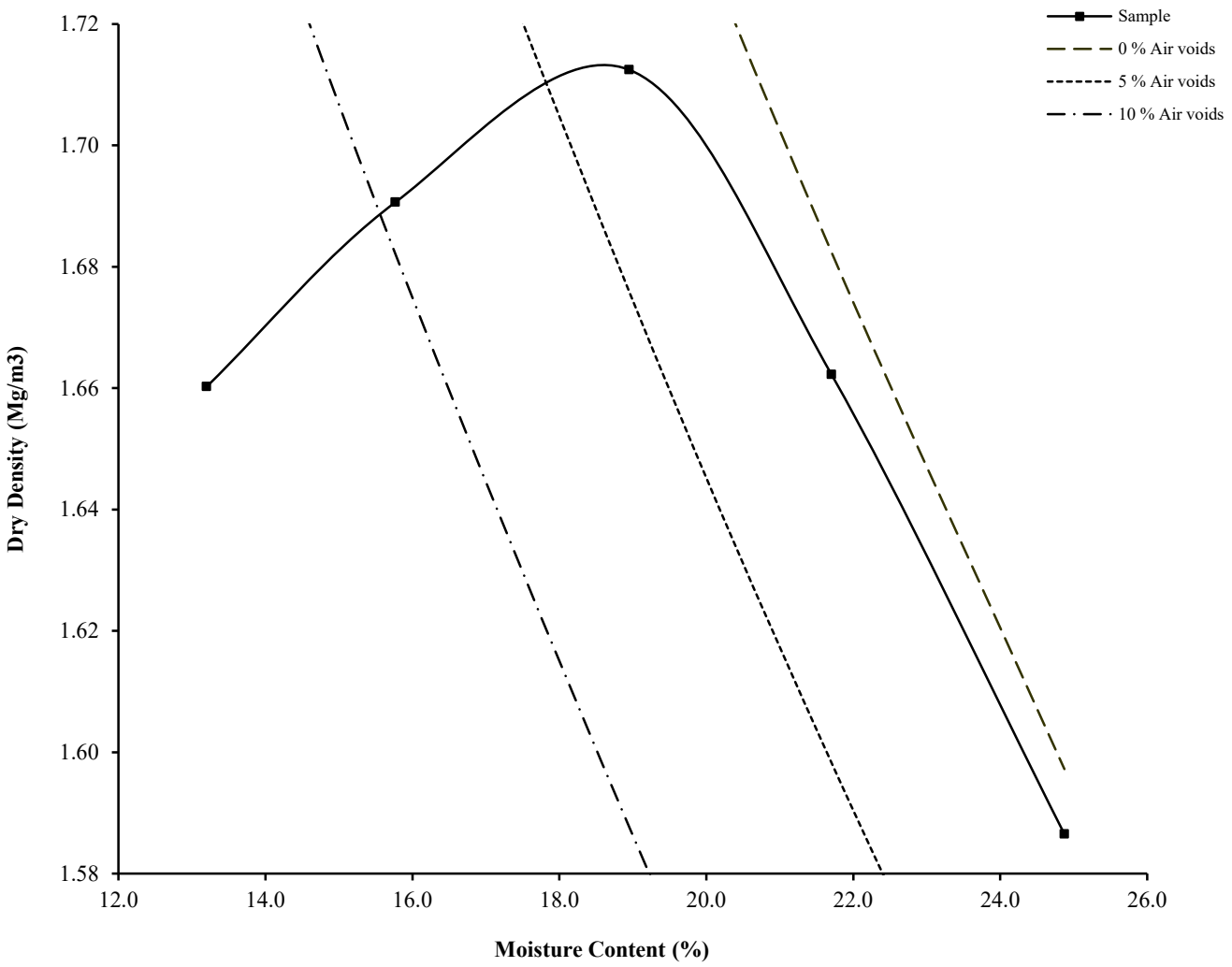


Initial Moisture Content:		19	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		57
Maximum Dry Density (Mg/m3):		1.64	Material Retained on 20.0 mm Test Sieve (%):		13
Optimum Moisture Content (%):		22			
Remarks See summary of soil descriptions.					

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**TP05**	**Top Depth (m) :**	**2.00**
Sample Number:	**12**	**Base Depth (m) :**	**2.60**
Sample Type:	**B**		

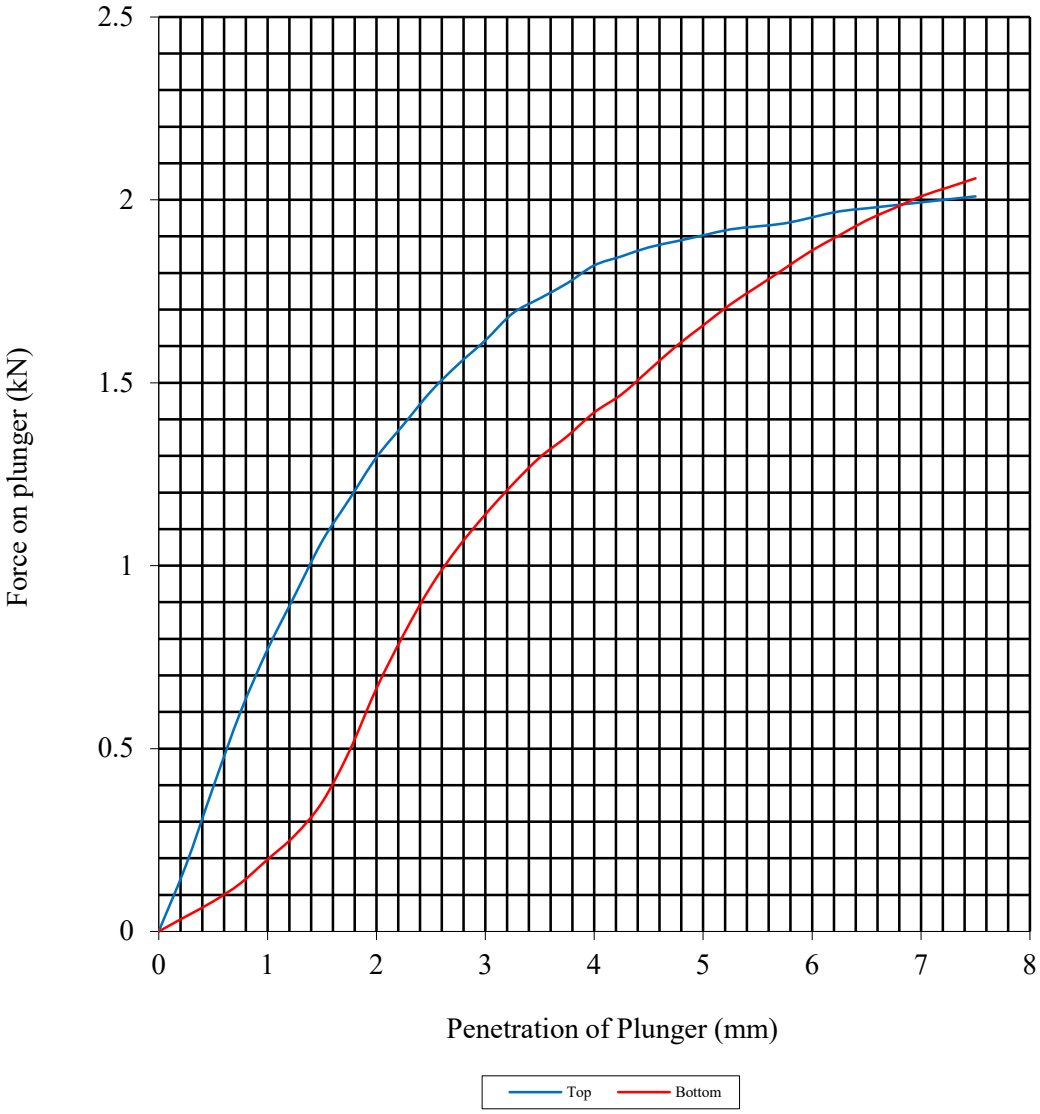


Initial Moisture Content:		19	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.71	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		19			
Remarks See summary of soil descriptions.					

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number:	**TP04**	**Top Depth (m):**	**1.00**
Sample Number:	**9**	**Base Depth (m):**	**2.00**
Sample Type:	**B**		



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	22	Surcharge Kg:	4.20	Sample Top	22	Sample Top	11.2
Bulk Density Mg/m3:	1.98	Soaking Time hrs	0	Sample Bottom	22	Sample Bottom	8.3
Dry Density Mg/m3:	1.62	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

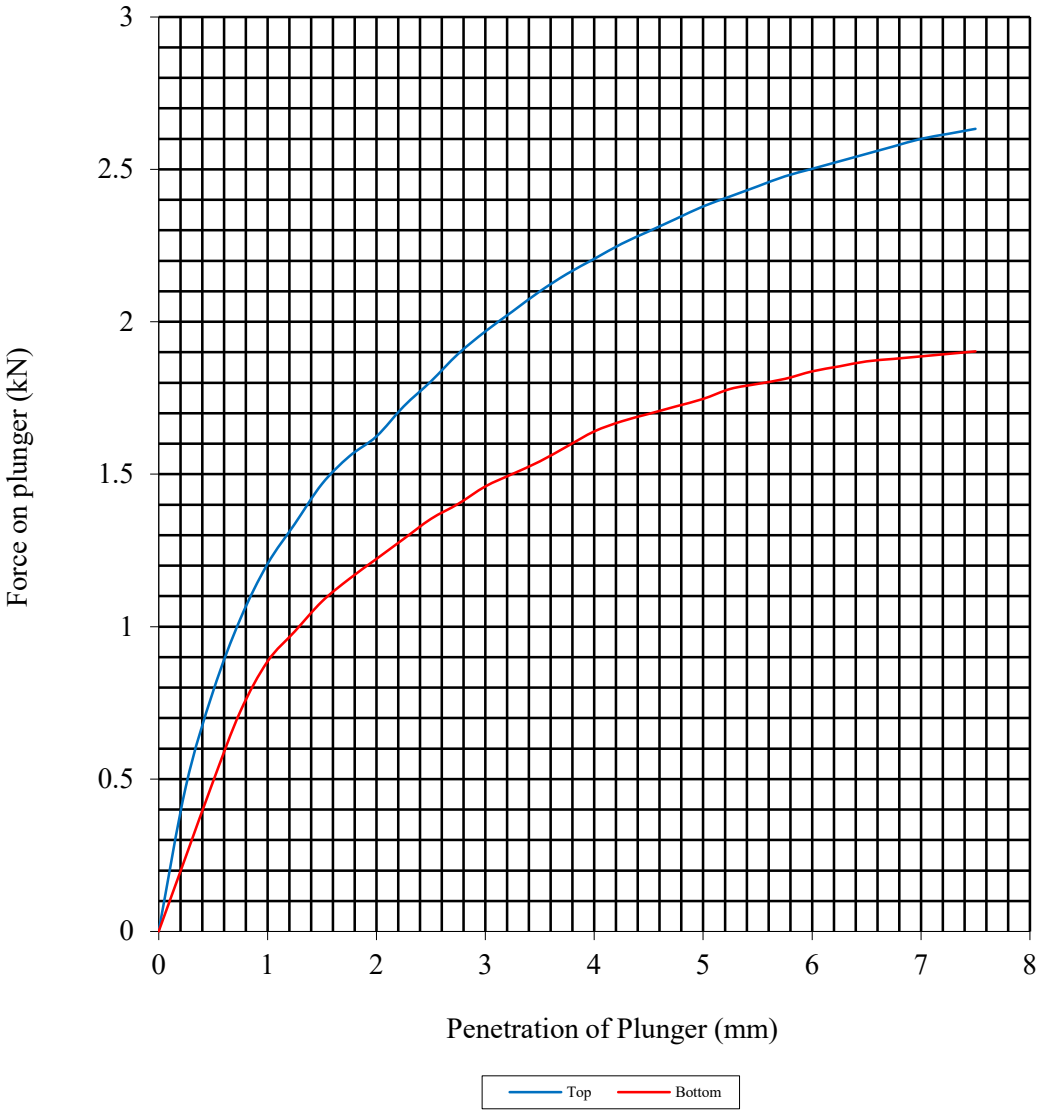
Fridays AD Plant

Contract No:
PSL19/1732
Client Ref:
4246

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number:	**TP06**	**Top Depth (m):**	**2.00**
Sample Number:	**11**	**Base Depth (m):**	**3.50**
Sample Type:	**B**		



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	26	Surcharge Kg:	4.20	Sample Top	26	Sample Top	13.7
Bulk Density Mg/m3:	1.95	Soaking Time hrs	0	Sample Bottom	26	Sample Bottom	10.3
Dry Density Mg/m3:	1.55	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Fridays AD Plant

Contract No: PSL19/1732

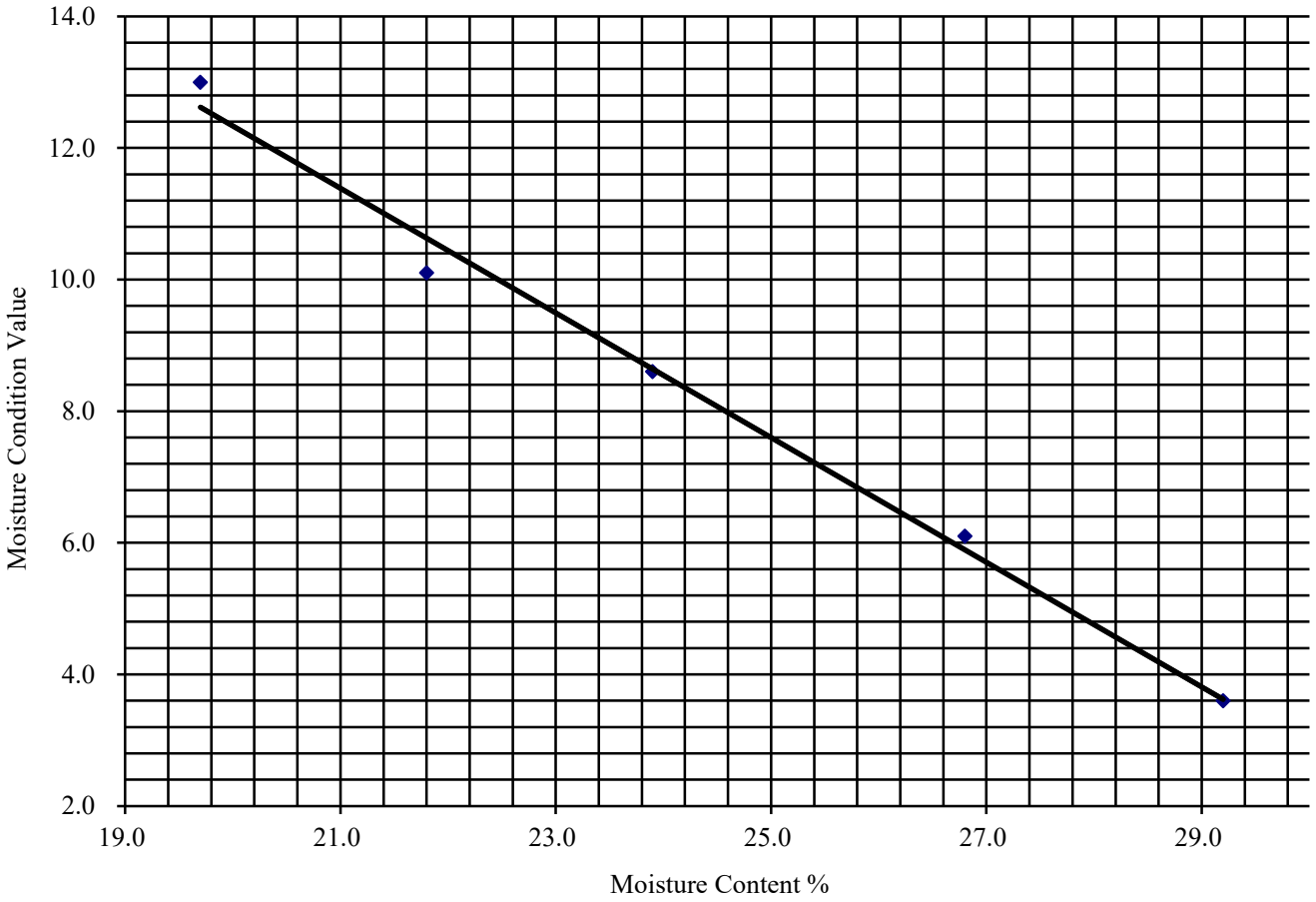
Client Ref: 4246

MOISTURE CONDITION VALUE CALIBRATION

BS1377 : Part 4 : 1990 Clause 5.5

Hole Number:	**TP01**	**Top Depth (m):**	**1.00**
Sample Number:	**9**	**Base Depth (m):**	**2.00**
Sample Type:	**B**		

Initial Moisture Content (%):	22
Single/Separate Samples Tested	Separate
Material Retained on the 20mm BS Test Sieve (%):	0



Test Results.

Test Number	1	2	3	4	5
Moisture Content (%)	19.7	21.8	23.9	26.8	29.2
MCV	13.0	10.1	8.6	6.1	3.6

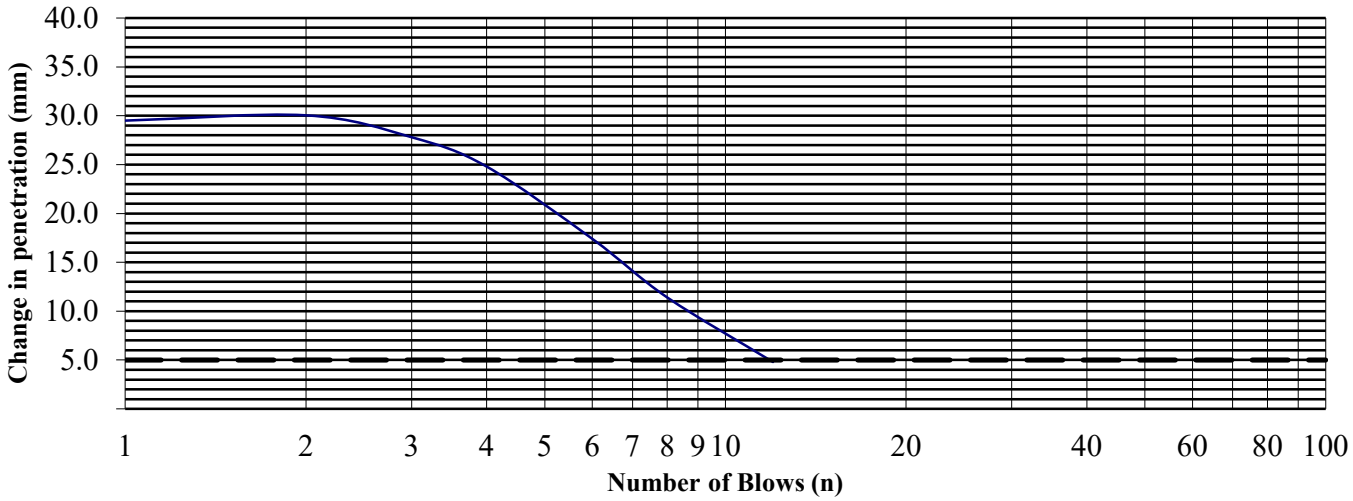
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP02**	**Top Depth (m):**	**0.90**
Sample Number:	**8**	**Base Depth (m):**	**1.80**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	120.0	29.5
2	105.7	30.0
3	96.8	27.8
4	90.5	24.8
6	81.8	17.4
8	75.7	11.4
12	69.0	4.8
16	65.7	
24	64.4	
32	64.3	
48	64.2	
64		
96		
128		
192		
256		

Test Results.

Moisture Content (%)	25
MCV	9.5

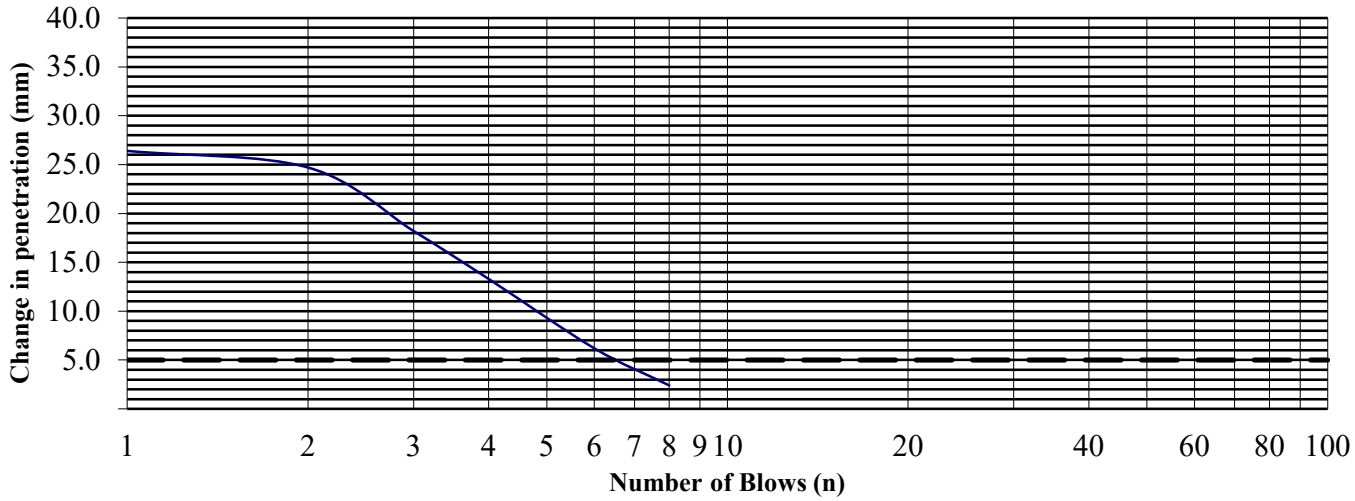
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP03**	**Top Depth (m):**	**1.20**
Sample Number:	**8**	**Base Depth (m):**	**2.00**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	108.2	26.4
2	95.3	24.7
3	87.2	18.2
4	81.8	13.3
6	74.5	6.2
8	70.6	2.4
12	69.0	
16	68.5	
24	68.3	
32	68.2	
48		
64		
96		
128		
192		
256		

Test Results.

Moisture Content (%)	27
MCV	8.2

MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP04**	**Top Depth (m):**	**1.00**
Sample Number:	**9**	**Base Depth (m):**	**2.00**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination

Blows (N)	Penetration (mm)	n to 4n (mm)
1	107.2	23.3
2	96.6	26.1
3	89.3	26.3
4	83.9	26.3
6	75.6	23.8
8	70.5	21.4
12	63.0	14.7
16	57.6	9.4
24	51.8	3.6
32	49.1	1.1
48	48.3	
64	48.2	
96	48.2	
128	48.0	
192		
256		

Test Results.

Moisture Content (%)	22
MCV	13.1

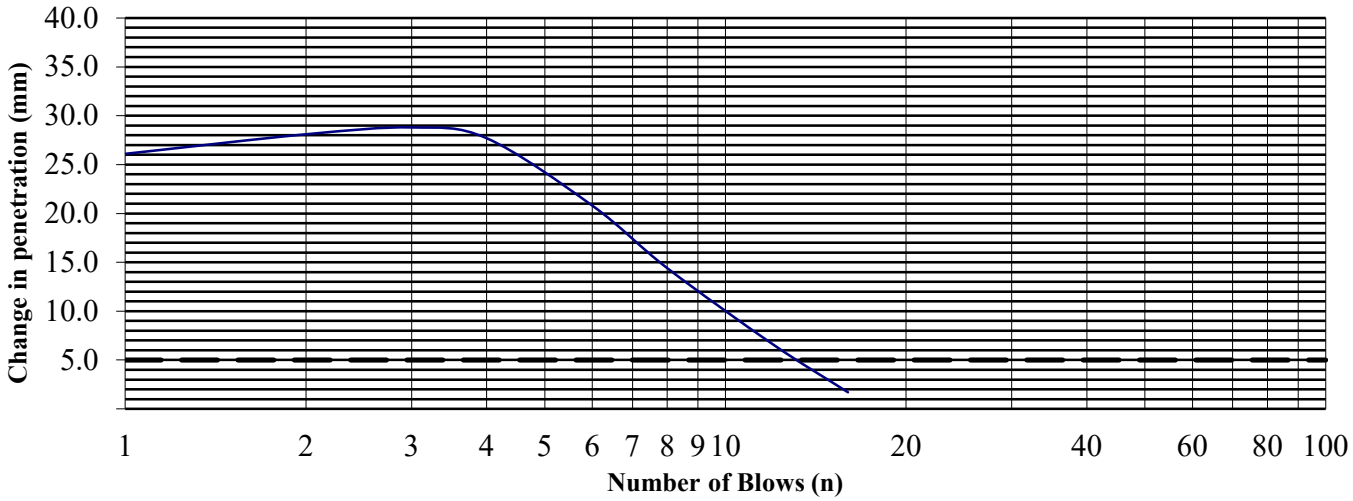
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP05**	**Top Depth (m):**	**2.00**
Sample Number:	**12**	**Base Depth (m):**	**2.60**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	99.0	26.1
2	86.3	28.1
3	79.0	28.8
4	72.9	27.7
6	64.7	20.8
8	58.2	14.4
12	50.2	6.6
16	45.2	1.7
24	43.9	
32	43.8	
48	43.6	
64	43.5	
96		
128		
192		
256		

Test Results.

Moisture Content (%)	19
MCV	11.2

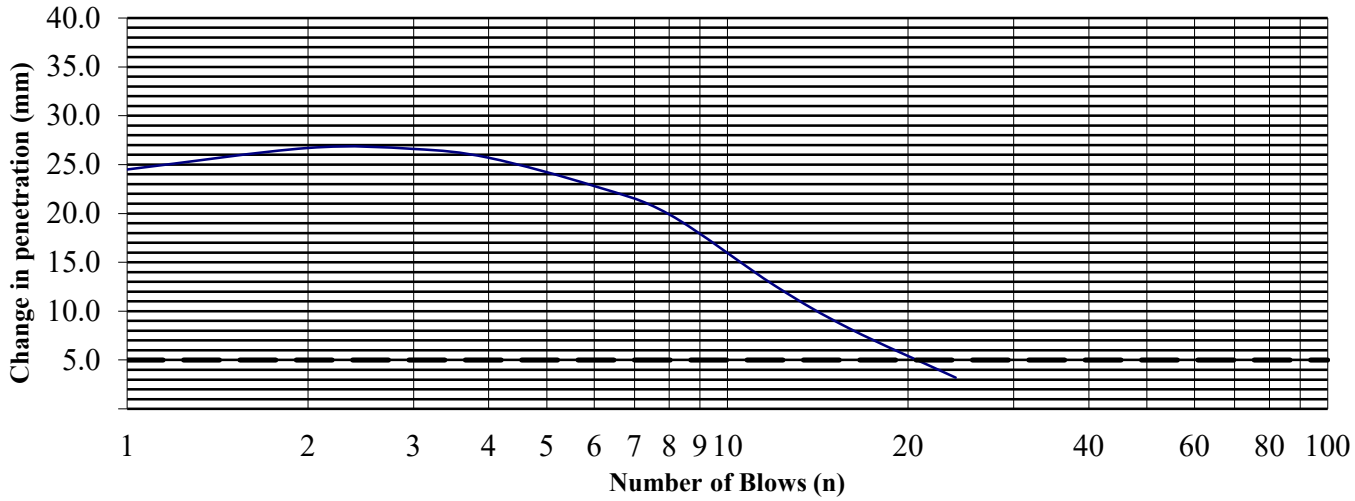
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP06**	**Top Depth (m):**	**2.00**
Sample Number:	**11**	**Base Depth (m):**	**3.50**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	101.6	24.5
2	90.4	26.7
3	82.6	26.6
4	77.1	25.7
6	69.0	22.8
8	63.7	19.9
12	56.0	12.6
16	51.4	8.2
24	46.2	3.2
32	43.8	
48	43.4	
64	43.2	
96	43.0	
128		
192		
256		

Test Results.

Moisture Content (%)	26
MCV	12.5

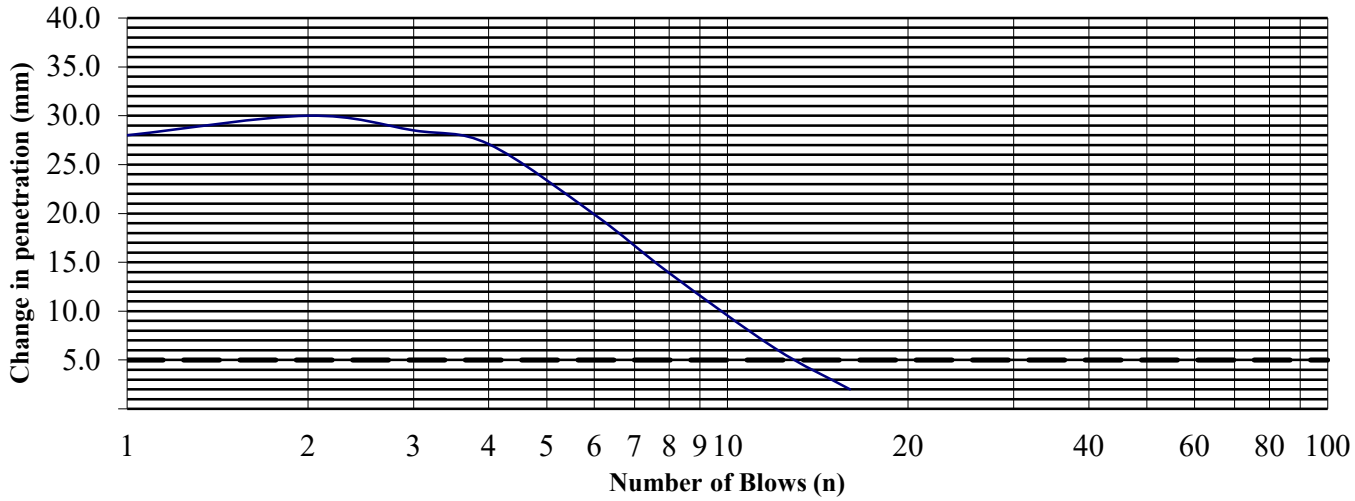
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP07**	**Top Depth (m):**	**1.00**
Sample Number:	**9**	**Base Depth (m):**	**2.00**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	121.4	28.0
2	108.7	30.0
3	99.1	28.5
4	93.4	27.1
6	84.9	19.9
8	78.7	13.9
12	70.6	6.2
16	66.3	2.0
24	65.0	
32	64.8	
48	64.4	
64	64.3	
96		
128		
192		
256		

Test Results.

Moisture Content (%)	28
MCV	11.0

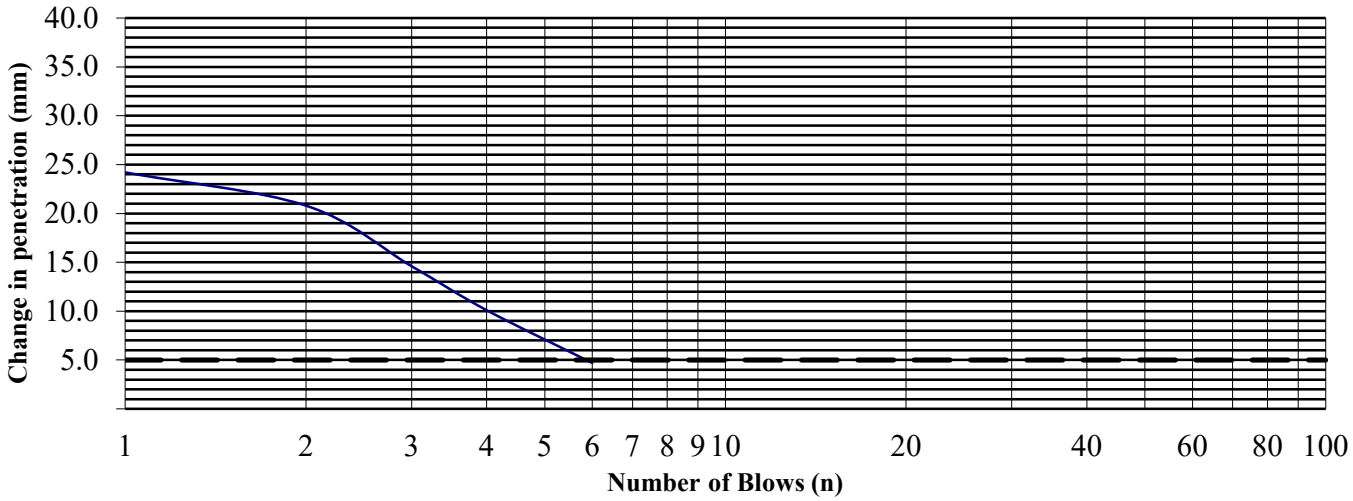
MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

Hole Number:	**TP20**	**Top Depth (m):**	**0.00**
Sample Number:	**4**	**Base Depth (m):**	**1.70**
Sample Type:	**B**		

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	102.9	24.2
2	90.9	20.8
3	83.5	14.6
4	78.7	10.1
6	72.9	4.7
8	70.1	
12	68.9	
16	68.6	
24	68.2	
32		
48		
64		
96		
128		
192		
256		

Test Results.

Moisture Content (%)	27
MCV	7.1

Certificate of Analysis

Certificate Number	19-05308
	26-Mar-19
Client	Professional Soils Laboratory Ltd 5/7 Hexthorpe Road Hexthorpe DN4 0AR
Our Reference	19-05308
Client Reference	PSL19/1732
Order No	(not supplied)
Contract Title	Fridays AD Plant
Description	2 Soil samples.
Date Received	21-Mar-19
Date Started	21-Mar-19
Date Completed	26-Mar-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 19-05308
Client Ref PSL19/1732
Contract Title Fridays AD Plant

			Lab No	1477159	1477160
			Sample ID	TP01	TP02
			Depth	1.00	0.50
			Other ID	4	2
			Sample Type	D	D
			Sampling Date	n/s	n/s
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Metals					
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10
Inorganics					
pH	DETSC 2008#			7.8	8.0
Chloride Aqueous Extract	DETSC 2055	1	mg/l	6.0	9.2
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	24	21
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	22	23
Sulphur as S, Total	DETSC 2320	0.01	%	0.02	0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02	0.03

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

Information in Support of the Analytical Results

Our Ref 19-05308
Client Ref PSL19/1732
Contract Fridays AD Plant

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1477159	TP01 1.00 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), pH + Conductivity (7 days)	
1477160	TP02 0.50 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), Total Sulphur ICP (365 days), Total Sulphate ICP (730 days), Metals ICP Prep (365 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