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REPORT ON A SITE INVESTIGATION

SLIP END FARM

ROYSTON ROAD

BALDOCK

HERTFORDSHIRE

Report Reference 142400

On behalf of:

D. Northern & Sons

Mill Cottage

Manor Farm

Bygrave

Baldock

SG7 5EE

April 2026

142400 Slip End Farm, Royston Road, Slip End, Baldock

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D. NORTHERN & SONS

PETER GEORGE TOWN PLANNING LIMITED

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INTRODUCTION

Lucion Ground Engineering Limited was instructed by the client, D. Northern & Sons, to carry out a Phase 2 ground investigation to establish the ground conditions beneath a plot of land within Slip End Farm, Royston Road, Baldock, Hertfordshire. These works were scheduled, by the client, in advance of proposed residential development of the site.

The ground investigation comprised ten window sample boreholes with geotechnical and chemical testing on recovered samples to determine the nature of the underlying soil.

This report provides the findings of the investigation and makes recommendations for the design of shallow foundations and provides comment on any soil contamination encountered.

Reference has been given to a Phase 1 desk study prepared for the client by others in 2023.

LOCATION, TOPOGRAPHY AND GEOLOGY OF THE SITE

The site is located about 1.75m to the north-east of the village of Bygrave, 5km to the north-east of Baldock and 5km to the east of the intersection between the A1 and the A1(M) as shown in Figure 1. The rural site is located within Slip End Farm, on the north-western side of the A505 Royston Road.

The site comprises a 70m wide by 100m long plot with a collection of about six barns/farm buildings divided by grass and bare earth within the north-eastern half and a concrete hard standing yard areas along the south-eastern side of the site as shown in Figure 2.

The buildings were of mixed brick, block and steel frame construction with cement bonded asbestos corrugated sheet roofing and side cladding.

The site was for the most part devoid of trees, although there were occasional trees within the fields around the site perimeter. There were four commercial vehicles and a Range Rover in varying states of disrepair located outside the northern site boundary. To the west and south of the site were agricultural buildings and a modern surface mounted plastic heating oil tank serving a dwelling to the south-east of the site.

The approximate National Grid Reference at the centre of the site is TL 287 371. The site lies about 130m to the north-east, on the northern valley side, of a stream called Cat Ditch. The site stood at about 71mOD along the western side, rising to about 77mOD along the eastern side.

The geological map at 1:50,000 scale, Sheet 221, and the BGS Geology of Britain viewer indicates the site to be directly underlain by the Middle Chalk, New Pit Chalk Formation. A ribbon of Alluvium is shown along the course of the Cat Ditch to the south-west and glacial deposits of the Lowestoft Formation overlie the Chalk, on the higher ground some 300m to the north and 500m to the north-west. There were several open shallow archaeological trenches situated along the north-eastern part of the site and these exposed the top of the Chalk at shallow depth.

SUMMARY OF CLIENT'S PHASE 1 DESK STUDY REPORT

Reference has been given to the client's Phase 1 desk study report, presented in Dice Environmental Report, 101029: 30 May 2023. The findings are summarised below.

Towards the end of Nineteenth Century through to the mid-Twentieth Century site contained a group of rural buildings, which adjoined a public house to the south-east. The site was subsequently developed as a farm in the 1970s, and extended in the 1980s/90s, to form the current configuration of Slip End Farm, which occupies the site. The report did not identify any pollution incidents recorded on or near the site.

Expected potential sources of contamination across the site would be associated with the storage and potential spillage of farm materials/chemicals. Also, contamination could be present within surface layers of made ground, which are likely to cover the site.

It is noted that the client had removed many farm materials/chemicals, including drums/containers and piles of discarded waste, prior to this Phase 2 ground investigation conducted in February 2026.

The desk study indicates that the site lies within an area where no radon protection measures would be necessary for new development. There are no landfills within 250m of the site and the composition of the underlying natural soil would suggest a low hazard potential for ground gas.

PRELIMINARY RISK ASSESSMENT

Potential sources of contamination present on or beneath the site would relate primarily to; the historical use of the site; possible damaged drainage; the presence of contaminated soil; and the potential presence of soil gas beneath the site.

In order to assess the risks associated with the presence of ground contamination the linkages between the sources and potential receptors to contamination need to be established and evaluated. This is in accordance with the Environmental Protection Act 1990, which provides a statutory definition of Contaminated Land. To fall within this definition it is necessary that, as a result of the condition of the land, substances may be present on or under the land such that

- *Significant harm is being caused or there is a significant possibility of such harm being caused; or*
- *Pollution of controlled waters is being, or is likely to be, caused*

There are three principal factors that are assessed whilst undertaking a qualitative risk assessment for any site. These are the presence of a contamination source, the existence of migration pathways and the presence of a sensitive target(s). It should be noted that it is necessary for each element of source, pathway and target to be present in order for exposure of a human or environmental receptor to occur.

UK Government guidance on the assessment of contaminated land, requires risk to human health and the environment to be reviewed using source – pathway – target relationships. If each of these elements is present, the linkage provides a potential risk to the identified targets.

Contaminants or ***potential pollutants*** identified as ***sources*** in relation to the identified previous uses are listed overleaf in Table 1.

Table 1: Identified Potential Contaminant Sources

<i>Contaminant Source</i>	<i>Comments</i>
Farm Materials/Chemicals	The client had removed many farm materials/chemicals, or potential sources of contamination, including drums/containers and piles of discarded waste prior to the Phase 2 ground investigation conducted in February 2026.
Drainage Beneath Site	Effluent from leaking drains would provide a contaminant source.
Soil Beneath Site	Contamination may be present within any made ground materials imported on the site or from historical spillage at surface or drain leakage.
Soil Gas	Potential soil gas generated from any made ground present.
Ground Contamination Outside Site Boundary	Ground contamination migrating from adjoining sites.

A **Pathway** is defined as one or more routes through which a receptor is being, or could be, exposed to, or affected by, a given contaminant.

Potential **Target or Receptors** fall within the categories of Human Health, Water Environment, Flora and Fauna, and Building Materials.

There are a number of possible pathways for the contaminants identified on the site to impact human and/or environmental receptors and these are summarised in Tables 2 and 3.

Table 2: Human Receptors and Pathways

<i>Human Receptor-Mechanism</i>	<i>Typical Exposure Pathway</i>
Human Inhalation	Breathing Dust and Fumes Breathing Gas emissions
Human Ingestion	Eating -contaminated soil, for example by small children -produce grown on contaminated soil Ingesting dust or soil on vegetables Drinking contaminated water
Human Contact	Direct skin contact with contamination Direct skin contact with contaminated liquids

Table 3: Water Receptors and Pathways

<i>Receptor-Water Environment</i>	<i>Typical Exposure Pathway</i>
The solid geology of the Middle Chalk, New Pit Chalk Formation is a Principal Aquifer and the site lies within a Source Protection Zone 1 (inner catchment).	Surface infiltration of atmospheric waters into the soils beneath the site could wash or dissolve potential contaminants and migrate to underlying groundwater. Contamination leads to restriction/prevention of use as a resource, for example, drinking water, and can have secondary impacts on other resources, which depend on it.
The site lies about 130m to the north-east, on the northern valley side, of a stream called Cat Ditch.	Surface infiltration of atmospheric waters into the soils beneath the site could wash or dissolve potential contaminants and laterally migrate. Contamination leads to a restriction/prevention of use: -as drinking water resource -for amenity use Effects on aquatic life

Preliminary Conceptual Model

Assessment of the potential linkage between ground contamination sources, human and environmental receptors have been assessed based on the desk study research documented in the preceding sections of this report.

A generalised preliminary conceptual model is presented below in Table 4.

Table 4: Preliminary Conceptual Model Relative to Residential Development

Receptors	Pathway	Estimated Potential for Linkage with Contaminant Sources				
		Farm Materials/ Chemicals	Drainage Beneath Site	Soil Beneath Site	Soil Gas	Ground Contamination from Outside Site Boundary
Human Health – ground/site workers	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Low likelihood	Low likelihood	Low likelihood	Low likelihood	Unlikely
Human Health – users of completed development	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Low likelihood	Low likelihood	Low likelihood	Low likelihood	Unlikely
Water Environment	Migration through ground into surface water or surrounding groundwater	Low likelihood	Low likelihood	Low likelihood	Low likelihood	Unlikely
Flora	Vegetation on site growing on contaminated soil	Low likelihood	Low likelihood	Low likelihood	Unlikely	Unlikely
Building Materials	Contact with contaminated soil	Low likelihood	Low likelihood	Low likelihood	Unlikely	Unlikely
<u>Key to Table 4</u> Estimated Potential for Linkage with Contaminant Source		Definition				
High likelihood		There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.				
Likely		There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.				
Low likelihood		There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term.				
Unlikely		There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.				
NA		Not Applicable				

SITE WORK

The site work was carried out on 18 and 19 February 2026 using a dynamic sampling rig. The works comprised ten window sample boreholes (WS01 to WS10), whose locations are shown in Figure 2. Service plans were consulted, and a cable avoidance tool (CAT) was used to check for the absence of buried services prior to boring.

The borehole records have been produced in accordance with British Standard BS5930:2015+A1:2020 'Code of Practice for Site Investigations' and are given in Appendix 1. The records provide the descriptions and depths of the various strata encountered, samples and in situ tests taken. The boreholes were started by the excavation, using hand tools, of a service inspection pit to a depth of 1.20m in order to ensure the absence of buried services. Representative small disturbed samples of soil were taken from the starter pit.

The window sample boreholes were formed by a small track-mounted window sampling and super heavy dynamic probing rig and taken to a depth of 3.45m. The window sampling equipment consisted of drive-in sample tubes of specially constructed and strengthened steel, lined with a plastic core-liner. The barrels were initially of 87mm, 77mm or 67mm internal diameter and were reduced in diameter with successive barrels with increasing depth. Upon extraction, a continuous 'undisturbed' profile of the soil was obtained within the plastic liners.

The standard penetration test (SPT) was carried out at regular intervals in order allow the assessment of the relative in-situ density or stiffness of the ground. The test was made by driving a split-barrel sampler (SPT(S)) into the soils at the base of the borehole by means of an automatic trip hammer weighing 63.50kg falling freely through 750mm. The penetration resistance was determined as the number of blows required to drive the tool the final 300mm of a total penetration of 450mm into the soil ahead of the borehole.

On completion a soil gas and groundwater monitoring installation was fitted into boreholes WS02, WS06 and WS08 to a depth of 3.00m. The installations comprised a standpipe fitted with a silica gravel surround up to a depth of 1.00m. A bentonite seal was inserted between

0.50m and 1.00m depth, above which the tube was sealed by a gas valve and a surface protective cover was fixed in concrete.

The remaining boreholes were filled with silica gravel and the surface reinstated.

Return Visits to Site

Return visits to site were undertaken on 25 March and 1 and 9 April 2026 to monitor the standpipe installations for depth to groundwater and the concentrations of methane, carbon dioxide and oxygen. Measurement was carried out using a Gasdata GFM430, which also recorded the atmospheric pressure and flow rate. The monitoring results are presented on and following the borehole records in Appendix 1.

GEOTECHNICAL LABORATORY TESTING

Samples recovered from the exploratory hole were tested in accordance with the recommendations of British Standard BS1377:1990 & 2016 'Methods of Tests for Soils for Civil Engineering Purposes' and other industry standards. The results of testing are presented on Laboratory Summary Sheets in Appendix 2.

Soil Moisture Content

The moisture content of selected samples was determined, and the results are reported as the percentage water content with respect to the dry mass of soil.

Atterberg Limit Tests

The liquid and plastic limits, and plasticity index, were determined for selected specimens for the purpose of engineering soil classification. The results are quoted as the percentage water with respect to the dry weight of soil.

Sulphate and pH Testing

Selected soil samples were tested to determine their pH-values and aqueous sulphate contents in order to provide advice on assessing the aggressive chemical environment in relation to buried concrete.

CHEMICAL LABORATORY TESTING

Selected soil samples were submitted to a UKAS Accredited Laboratory who carried out a suite of tests, which encompassed a wide range of potential contaminants outlined by the Environment Agency (EA) and National House Building Council (NHBC) document R&D 66; 2008 'Guidance for the Safe Development of Housing on Land Affected by Contamination'.

Tests were carried out to screen the samples for the following potential contaminants: total arsenic, total cadmium, total chromium, hexavalent chromium, total lead, total mercury, total selenium, water soluble boron, total copper, total nickel, total zinc, total cyanides, free cyanides, soluble sulphate, sulphides and pH-value, phenols and polyaromatic hydrocarbons (PAH), including benzo[a]pyrene, petroleum hydrocarbons (TPH) and asbestos.

The results of chemical testing are presented in Appendix 3.

GROUND CONDITIONS

The strata encountered in the exploratory holes comprised a surface layer of made ground, which was locally present over a superficial Head Deposit in WS02, WS06 to WS09. The solid geology of the White Chalk Subgroup was encountered underlying either the made ground or the Head Deposit at depths of between 0.40m and 1.30m. The Chalk was present to at least the base of the boreholes at 3.45m.

Made Ground

Made ground should be expected beneath the hardstanding and building areas.

Boreholes WS08, WS09 and WS10, which were situated within the yard areas along the south-eastern side of the site, encountered made ground present to depths of 0.30m to 0.50m.

The made ground in WS08 comprised a 0.15m thick layer of brown/black silty, sand/gravel of angular brick, clinker, ash, flint and roadstone.

A 0.10m thick surface layer of concrete was encountered in WS09 and was underlain by brown, clayey, sandy gravel of angular flint and quartzite, present to 0.30m depth.

The made ground in WS10 was present to 0.50m depth and comprised firm dark brown, gravely, silty clay. The gravel fraction comprised angular to rounded flint and quartzite.

Made Ground (Reworked Head Deposit)

A 0.15m to 0.60m thick surface layer, encountered within the grass and bare earth areas around the buildings (WS01 to WS07), comprised a Head Deposit, which had been reworked by historical human activity, into a firm, dark brown, slightly sandy, slightly gravelly, silty clay fill, where the gravel fraction comprised angular to sub-angular chalk and flint. Several open shallow trenches, situated along the north-eastern part of the site, had previously been excavated by archaeologists who were interested in this made ground layer.

Head Deposit

A 0.20m to 1.15m thick layer of firm, brown, gravelly, silty clay was encountered in WS02, WS06 and WS07 where the gravel fraction comprised angular to sub-rounded chalk. This layer was also encountered in WS08 and WS09 below the made ground.

The base of the Head Deposit was at depths between 0.60m and 1.30m.

White Chalk Subgroup

The solid geology of the White Chalk Subgroup was encountered underlying the made ground and Head Deposit at depths of between 0.60m and 1.30m, and below the made ground at 0.50m depth in WS10.

The White Chalk Subgroup was encountered as structureless chalk composed of interbedded layers of white, slightly gravelly to gravelly silt; and white, very silty gravel. The gravel fraction comprised angular to sub-rounded chalk.

Groundwater

No groundwater was encountered in the exploratory holes, which were completed at 3.45m depth.

Observations

No visual or olfactory evidence of soil contamination was observed in the boreholes.

Rootlets were present to depths between 0.20m and 0.60m depth.

COMMENTS ON THE GROUND CONDITIONS IN RELATION TO FOUNDATION DESIGN AND CONSTRUCTION

The work was carried out in order to establish the ground conditions beneath a plot of land within Slip End Farm, Royston Road, Baldock, Hertfordshire. These works were scheduled, by the client, in advance of a proposed change of use of agricultural buildings to ten dwellinghouses with associated building operations, private gardens and car parking.

The strata encountered in the exploratory holes comprised a 0.15m o 0.60m thick surface layer of made ground/reworked Head Deposit. This rested on either a superficial Head Deposit, or the underlying solid geology of the White Chalk Subgroup, which was present at depths between 0.50m and 1.30m. The Chalk was present to at least the base of the boreholes at 3.45m. It is likely that the interface between the Head Deposit and the White Chalk Subgroup is irregular and could be present at shallower or deeper depth in other locations beneath the site.

The made ground is considered unsuitable as a founding stratum.

The Head Deposit, which was encountered at depths between 0.15m and 1.30m, should be considered only suitable for lightly loaded foundations due to its potentially variable composition. The underlying solid geology of the White Chalk Subgroup is considered to provide the most favourable bearing properties for traditional foundations.

Depth of Traditional Foundation

The underlying White Chalk Subgroup is considered to be non-shrinkable, but due to it being frost susceptible, a minimum foundation depth of 0.60m would be recommended within this stratum.

The depth of traditional footings would need to be deep enough to protect against the effects of soil desiccation or soil heave within the Head Deposit. Laboratory testing the near surface silt Head Deposit gave modified plasticity indices of between 15% to 27%, which indicates a low and medium volume change potential according to the National House Building Council

(NHBC) Standards Chapter 4.2 “Building near Trees” (2026). Guidance on the necessary foundation depths relating to tree species, distance and soil plasticity can be determined from the latter document, which should also be consulted where new planting is proposed.

In order to address any potential future shrinkage or heave effects, a medium volume change potential has been assumed for the Head Deposit beneath the site. At an open position well away from the influence of trees and shrubs a minimum foundation depth of 0.90m below ground level or finished floor level, whichever is deepest, would be required for foundations in order to avoid the zone of seasonal volume change in accordance with the above document.

The site was for the most part devoid of trees, although there were occasional trees around the site perimeter. It is recommended that a full survey of tree species is completed prior to final foundation design, whose depth should take into account the tree water demand in relation to height in accordance with the latter NHBC document. If the thickness of the Head Deposit Formation is less than the specified depth, the foundations should be directly placed in the underlying non-shrinkable White Chalk Subgroup, which was present at depths between 0.60m and 1.30m.

Shallow Foundation Bearing Pressures

The following allowable bearing pressures (Table 5), which incorporate a factor of safety of 3.0 against general shear failure in clay, should be considered for foundations taken through the made ground surface layers and placed at a minimum depth of 0.60m within the White Chalk Subgroup and at a minimum depth of 0.90m within the Head Deposit.

Settlements would not be expected to exceed 25mm at these pressures.

Table 5: Allowable Bearing Pressures for settlement of less than 25mm			
Stratum	Foundation Depth	Pad Footing	Strip Footing
		1.0m wide	1.0m wide
Head Deposit	0.90m	75kN/m ²	75kN/m ²
White Chalk Subgroup	0.60m-2.50m	125kN/m ²	125kN/m ²

Floor Slab

Non-load bearing ground bearing floor slabs could be used for areas outside the zone of influence of trees, providing that all topsoil is removed and that the underlying ground is proof rolled to identify any soft or loose spots, which should also be removed and replaced with geotechnically suitable granular fill. It is recommended that any filled material beneath the floor slab should be properly engineered to minimise differential settlement.

All areas, which lie within the zone of influence of the trees, should be inspected to ensure that all root infested clay is removed and replaced with well graded, compacted coarse grained fill material in accordance with the recommendations in NHBC Standards Chapter 4.2. Suspended floors with voids, in accordance with Table 7 of the latter document, should also be used in situations where heave could occur within the area bounded by the foundations.

Foundation Excavations and Groundwater

Following preparation, the base of foundation excavations should be inspected to ensure that the condition of the soil complies with that assumed in design. Should pockets of inferior material be present they should be removed and replaced with well graded hardcore or lean mix concrete. Water should be excluded from foundation excavations; otherwise, rapid and significant loss of bearing capacity may occur. The excavated surface should be protected from deterioration and a blinding layer of concrete used where foundations are not completed without delay.

Excavations should be expected to be unstable and should not be relied upon to stand unsupported even in the short term. Safety precautions should not be neglected especially where personnel are to enter excavations, when close side support will be required in order to maintain excavation stability.

No groundwater was encountered in the exploratory holes, which were completed at 3.45m depth. Shallow excavations could however encounter water seepages following periods of wet weather due to surface infiltration. It is likely that water ingress within shallow excavations in the short term could be controlled by screened sump pump techniques.

Buried Concrete

Tests on samples taken from the Head Deposit and White Chalk Subgroup to determine the risk of sulphate attack on buried concrete indicate levels that fall into Class DS-1 as defined by Table C2 of BRE Special Digest 1, 2005. The pH results indicate alkaline ground conditions with pH values ranging between 7.3 and 9.4.

For the purposes of design an Aggressive Chemical Environment for Concrete (ACEC) Class of AC-1 should be considered when specifying a Design Chemical Class (DC Class) for concrete used. An extract of Table C2, Aggressive Chemical Environment for Concrete (ACEC) site classification, from BRE Special Digest 1, 2005 is presented in Appendix 4.

COMMENTS ON SOIL CHEMICAL TESTING

The results of the laboratory chemical testing on near surface soil samples have primarily been compared to soil screening values (SSVs) produced by Land Quality Management Limited (LQM) and the Chartered Institute for Environmental Health (CIEH) presented in their document ‘The LQM/CIEH S4ULs for Human Health Risk Assessment: 2015 (Publication Number S4UL3608)’. The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and are transparently-derived and cautious ‘trigger values’ above which further assessment of the risks or remedial action may be needed. The S4ULs (Suitable for Use Levels) have been derived, in accordance with UK legislation and Environment Agency policy, using a modified version of the Environment Agency CLEA 1.06 software.

Reference has also been given to AGAC soil screening values produced by Society of Brownfield Risk Assessment (SoBRA) as documented in their July 2020 publication ‘Development of Acute Generic Assessment Criteria for Assessing Risks to Human Health from Contaminants in Soil’. With the absence of a S4UL for cyanide, the SoBRA AGAC has been used as the soil screening criteria within this report because the acute dose toxicity thresholds for free cyanide are very close to the chronic dose toxicity thresholds.

In 2014 the Department for Environment Food and Rural Affairs (DEFRA) published, in their document SP1010, Category 4 Screening Levels (C4SL) for several contaminants including lead. The C4SL represent screening levels below which the land could be considered suitable for a specified use and definitely not contaminated land in respect of those determinands. With the absence of S4UL for lead the C4SL has been used as the soil screening criteria within this report.

For each contaminant the adopted soil screening criteria have been calculated for the following land uses:

- Residential use with home grown produce
- Residential use without home grown produce
- Public open spaces near residential housing

The intended purpose of the SSVs are as “intervention values” in the regulatory framework for assessment of human health risks in relation to land use. These values are not binding standards but are intended to inform judgements about the need for action to ensure that a new use of land does not pose any unacceptable risks to the health of the intended users.

Tables 6 to 8 compare the test results for the made ground with the SSVs in relation to the specified uses. The number of test results, which exceed these values, are also provided.

Residential use with home grown produce criteria is considered to provide appropriately conservative screening values for the proposed residential development.

Table 6: Comparison of Chemical Test Results for Near Surface Soil with Soil Screening Values (SSV)

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Measured 95 th Percentile (mg/kg)	Soil Screening Values (SSV) (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Public Open Space near Residential Housing		Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Public Open Space near Residential Housing (mg/kg)
Organic matter	10	1.5	8.2	-	-	-	5.1	-	-	-	-
Arsenic	10	1.2	11	0	0	0	7.32	S4UL	37	40	79
Cadmium	10	0.15	0.80	0	0	0	0.48	S4UL	11	85	120
Total Chromium	10	4.7	35	0	0	0	17.66	S4UL	910	910	1500
Hexavalent Chromium	10	<0.50	<0.50	0	0	0	<0.50	S4UL	6	6	7.7
Lead	10	14	160	0	0	0	45.82	C4SL	200	310	630
Mercury	10	<0.05	1.1	0	0	0	0.35	S4UL	11	15	40
Selenium	10	<0.25	0.86	0	0	0	0.45	S4UL	250	430	1100
Nickel	10	6.5	24	0	0	0	14.07	S4UL	130	180	230
Phenols	10	<0.10	<0.10	0	0	0	<0.10	S4UL	120	440	440
Copper	10	7.6	31	0	0	0	19.55	S4UL	2400	7100	12,000
Zinc	10	34	270	0	0	0	171.01	S4UL	3700	40,000	81,000
Free Cyanide	10	<0.50	<0.50	0	0	0	<0.50	AGAC	24	24	24

Notes

The concentration of Trivalent Chromium is assumed to be equivalent to the Total Chromium concentration. This is because most naturally occurring chromium is in the trivalent (chromic) state.

S4UL and C4SL for metals were derived using 6% SOM. These values are not sensitive to SOM and would also be applicable for 1% SOM and 2.5% SOM

LQM/CIEH S4ULs 'Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3608. All rights reserved'

AGAC soil screening values produced by Society of Brownfield Risk Assessment (SoBRA) as documented in their July 2020 publication 'Development of Acute Generic Assessment Criteria for Assessing Risks to Human Health from Contaminants in Soil'.

Table 7: Comparison of PAH Chemical Test Results for Near Surface Soil with Soil Screening Values (SSV)

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Measured 95 th Percentile (mg/kg)	Soil Screening Values (SSV) (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Public Open Space near Residential Housing		Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Public Open Space near Residential Housing (mg/kg)
Acenaphthene	10	<0.05	0.25	0	0	0	0.18	S4UL	210	3000	15,000
Acenaphthylene	10	<0.05	3.2	0	0	0	1.49	S4UL	170	2900	15,000
Anthracene	10	<0.05	1.4	0	0	0	0.86	S4UL	2400	3100	74,000
Benzo[a]anthracene	10	<0.05	1.9	0	0	0	1.47	S4UL	7.2	11	29
Benzo[a]pyrene	10	<0.05	2.2	0	0	0	1.57	S4UL	2.2	3.2	5.7
Benzo[b]fluoranthene	10	<0.05	2.6	0	0	0	1.91	S4UL	2.6	3.9	7.1
Benzo[g,h,i]perylene	10	<0.05	1.3	0	0	0	0.91	S4UL	320	360	640
Benzo[k]fluoranthene	10	<0.05	0.92	0	0	0	0.68	S4UL	77	110	190
Chrysene	10	<0.05	1.7	0	0	0	1.31	S4UL	15	30	57
Dibenz[a,h]anthracene	10	<0.05	0.29	4	0	0	0.22	S4UL	0.24	0.31	0.57
Fluoranthene	10	<0.05	4.4	0	0	0	3.52	S4UL	280	1500	3100
Fluorene	10	<0.05	2.3	0	0	0	1.12	S4UL	170	2800	9900
Indeno[1,2,3-cd]pyrene	10	<0.05	1.6	0	0	0	1.17	S4UL	27	45	82
Naphthalene	10	<0.05	0.27	0	0	0	0.18	S4UL	2.3	2.3	4900
Phenanthrene	10	<0.05	2.8	0	0	0	2.14	S4UL	95	1300	3100
Pyrene	10	<0.05	5.3	0	0	0	3.39	S4UL	620	3700	7400
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Table 8: Comparison of TPH Chemical Test Results for Near Surface Soil with Soil Screening Values (SSV)

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Measured 95 th Percentile (mg/kg)	Soil Screening Values (SSV) (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Public Open Space near Residential Housing		Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Public Open Space near Residential Housing (mg/kg)
Aliphatic VPH >C5-C6	10	<0.05	<0.05	0	0	0	<0.05	S4UL	42	42	570,000
Aliphatic VPH >C6-C8	10	<0.10	<0.10	0	0	0	<0.10	S4UL	100	100	600,000
Aliphatic VPH >C8-C10	10	<0.05	<0.05	0	0	0	<0.05	S4UL	27	27	13,000
Aliphatic EPH >C10-C12	10	<2.0	<2.0	0	0	0	<2.00	S4UL	130	130	13,000
Aliphatic EPH >C12-C16	10	<2.0	<2.0	0	0	0	<2.00	S4UL	1,100	1,100	13,000
Aliphatic EPH >C16-C35	10	5.0	16.8	0	0	0	9.46	S4UL	65,000	65,000	250,000
Aliphatic EPH >C35-C40	10	<10	<10	0	0	0	<10	S4UL	65,000	65,000	250,000
Aromatic VPH >C5-C7	10	<0.05	<0.05	0	0	0	<0.05	S4UL	70	370	56,000
Aromatic VPH >C7-C8	10	<0.05	<0.05	0	0	0	<0.05	S4UL	130	860	56,000
Aromatic VPH >C8-C10	10	<0.05	<0.05	0	0	0	<0.05	S4UL	34	47	5,000
Aromatic EPH >C10-C12	10	<2.0	<2.0	0	0	0	<2.00	S4UL	74	250	5,000
Aromatic EPH >C12-C16	10	<2.0	2.4	0	0	0	2.11	S4UL	140	1,800	5,100
Aromatic EPH >C16-C21	10	<2.0	36	0	0	0	16.37	S4UL	260	1,900	3,800
Aromatic EPH >C21-C35	10	<2.0	120	0	0	0	55.71	S4UL	1,100	1,900	3,800
Aromatic EPH >C35-C40	10	<1.0	33	0	0	0	12.33	S4UL	1,100	1,900	3,800

Notes
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Discussion of Results

Chemical testing was undertaken on ten samples of near surface ground, which was present with a thickness of between 0.15m and 0.60m. With the exception of the PAH dibenz(a,h)anthracene, none of the determinand concentrations exceeded the respective SSV for residential with home grown produce and residential without home grown produce end use or public open space near residential housing.

Slightly elevated concentrations of dibenz(a,h)anthracene, present within samples of made ground taken from WS02, WS04, WS05 and WS07, exceeded SSV for residential with home grown produce, but were below the SSV residential without home grown produce end use or public open space near residential housing. The measured 95th percentile value, of 0.22mg/kg, for dibenz(a,h)anthracene is below the respective SSV of 0.24mg/kg for residential home grown produce. This indicates that the majority of the made ground could be considered suitable for use as all other determinand concentrations are below residential SSV.

Concentrations of total petroleum hydrocarbons varied between <0.05mg/kg and 190mg/kg and are believed to be due to the presence of organic matter in the soil rather than petroleum fuel.

No asbestos was detected in the ten samples screened.

SOIL GAS

Soil gas and water monitoring of the standpipes WS02, WS06 and WS08 was conducted on 25 March, and 1 and 9 April 2026.

Concentrations of less than 0.1% by volume methane were encountered with carbon dioxide concentrations between 0.4% and 1.2% by volume. Oxygen levels between 19.4% and 20.2% were also measured.

The results indicate a Gas Screening Value (GSV) of 0.0001l/hr for methane and 0.0012l/hr for carbon dioxide.

The results fall into Characteristic Situation 1 as defined by BS8485:2015+A1:2019 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

UPDATED CONCEPTUAL MODEL

A generalised conceptual model, updated following the intrusive works, monitoring and testing, is presented below in Table 9 and follows the comparison of consequence against probability presented in CIRIA 552.

Table 9: Updated Conceptual Model & Risk Assessment Relative to Construction and Future Residential Development

<u>Table 9</u> Source	Pathway	Receptor	Probability of risk being realised	Consequence of risk being realised	Risk Classification
Contamination from Made Ground Soil Beneath Site	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Human Health Groundworkers	Low likelihood	Minor	Very Low Risk
		Human Health Site Users if exposed at surface	Low likelihood	Minor	Very Low Risk
		Human Health Site Users if present beneath permanent hardstanding/roads	Unlikely	Minor	Very Low Risk
	Migration through ground into surface water or groundwater	Water Environment	Unlikely	Minor	Very Low Risk
Natural Soil Beneath Site	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Human Health Groundworkers	Unlikely	Minor	Very Low Risk
		Human Health Site Users if exposed at surface	Unlikely	Minor	Very Low Risk
		Human Health Site Users if present beneath permanent hardstanding/roads	Unlikely	Minor	Very Low Risk
	Migration through ground into surface water or groundwater	Water Environment	Unlikely	Minor	Very Low Risk
Soil Gas	Inhalation of Soil Gas	Human Health Groundworkers	Low likelihood	Minor	Very Low Risk
		Human Health Site Users	Low likelihood	Minor	Very Low Risk

Table 9 Source	Pathway	Receptor	Probability of risk being realised	Consequence of risk being realised	Risk Classification
Ground Contamination Outside Site boundary	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Human Health Groundworkers	Unlikely	Minor	Very Low Risk
		Human Health Site Users	Unlikely	Minor	Very Low Risk
	Migration through ground into surface water or groundwater	Water Environment	Unlikely	Minor	Very Low Risk

Key to Table 9 Risk	Definition
Very High risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. The risk, if realised, is likely to result in a substantial liability. <u>Urgent investigation (if not undertaken already) and remediation are likely to be required.</u>
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. <u>Urgent investigation (if not undertaken already) and remedial works may be necessary in the short term and likely over the long term.</u>
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

COMMENTS ON GROUND CONTAMINATION IN RELATION TO PROPOSED RESIDENTIAL DEVELOPMENT

The ground investigation works have been carried out in advance of proposed residential redevelopment of the site.

This investigation may not have revealed the full depth or extent of made ground or contamination on the site and appropriate professional advice should be sought if subsequent site works reveal materials that appear to be contaminated.

Contamination Risk - Drainage

When preparing for redevelopment, redundant foul and surface water drain runs should be removed from beneath the site and precautions implemented to ensure that any remaining effluent is directly disposed of off-site. The integrity of existing drainage should be checked, and damaged sections replaced prior to re-use within the development. The latter measures should reduce the future likelihood of contaminants affecting human health and water environment to very low.

Contamination Risk - Farm Materials/Chemicals

It is noted that the client had removed many farm materials/chemicals, or potential sources of contamination, including drums/containers and piles of discarded waste prior to the Phase 2 ground investigation conducted in February 2026.

The presence of farm materials/chemicals inside the agricultural buildings could present a moderate risk to the underlying ground conditions if not dealt with correctly. Consequently, in order to eliminate this risk, the removal of all such sources would be recommended. All drums and chemicals should be decommissioned prior to their removal, which

should also include the removal of obviously polluted spoil/soil. The latter measures should reduce the future risk to human health and water environment to very low.

Contamination Risk - Near Surface Soil

The surface cover of made ground and natural soil across this site is considered to pose a very low risk to the proposed residential usage.

Human Health - Construction Workers

No special precautions would be required during the development of the site by workers who may come into contact with the soil during groundworks, providing standard precautions are adopted, which should generally include the procedures given by the Health and Safety Executive (The Blue Book).

For the protection of these workers during groundworks the following is recommended:

- a) Limit repeated or prolonged skin contact with soils by wearing gloves with sleeves rolled down.
- b) Washing facilities should be made available to groundworkers, so as to minimise the potential for inadvertent ingestion of soil.
- c) If any soils are revealed, which are different to those encountered by this ground investigation, the advice of a specialist should be sought in view of classifying the material and ascertaining its risk to groundworkers.

Human Health – Residential use and Garden Areas

Whilst no specific scheme of remediation would be considered necessary it is recommended that all garden/landscaped areas should be inspected prior to final capping to ensure that unsuitable materials have not been inadvertently placed in the garden or landscaped areas during the preceding stages of redevelopment works.

It is expected that some of the made ground, including the concrete and gravel fill making up the yard areas, would be unsuitable for use as a topsoil and it is likely that topsoil would need to be imported in order to make up residential garden areas.

All imported soil should be certified ‘clean’ fill and should be suitable for use in accordance with UK legislation and Environment Agency policy.

Methane and Carbon Dioxide Soil Gas

The desk study indicates that there are no landfills within 250m of the site and the composition of the underlying natural soil would suggest a low soil gas hazard potential.

The results indicate a Gas Screening Values (GSV), which fall into Characteristic Situation 1 as defined by BS8485:2015+A1:2019 ‘Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.

In conclusion, for the proposed residential usage, gas protection measures are not considered necessary in relation to methane and carbon dioxide soil gases.

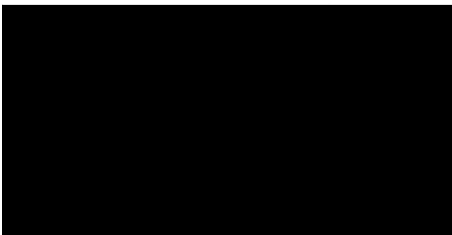
Off-Site Disposal of Soil Arisings

The results of chemical analysis are provided in Appendix 3 and can be used within the suite of information necessary for basic characterisation of the soil destined for landfill. Excavated material and excess spoil should always be classified prior to removal from site as required by ‘Duty of Care’ (Environmental Protection Act, 1990) legislation. This means that material has to be given a proper description and waste classification prior to removal. Basic

characterisation is the responsibility of the waste producer and compliance checking and on-site verification are generally the responsibility of the landfill operator. The landfill operator will need to liaise with the waste producer as the approach relies on the information from basic characterisation.

The clean arisings from the underlying natural soils, excluding peat and topsoil, across this site should fall under the EWC code 17 05 04 inert category.

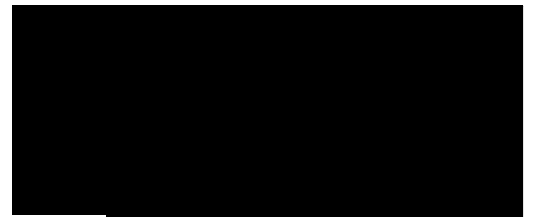
LUCION GROUND ENGINEERING LIMITED



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Associate



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Figures

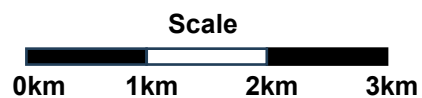
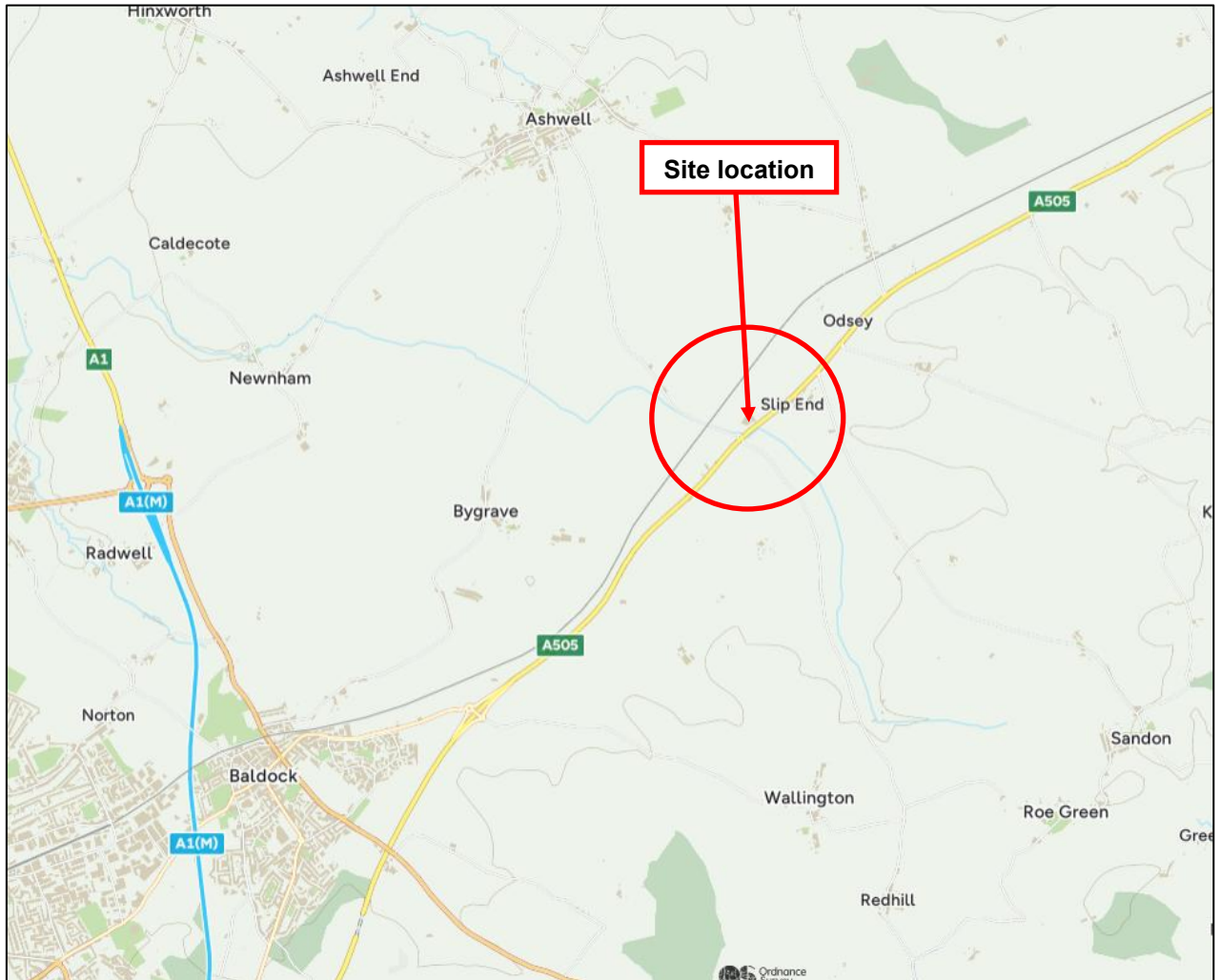
Figure 1: Site Location Plan

Figure 2: Exploratory Hole Location Plan

Site Location Plan

Figure 1

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Project : Slip End Farm, Royston Road, Slip End, Baldock, Hertfordshire

Client : D. Northern and Sons Limited

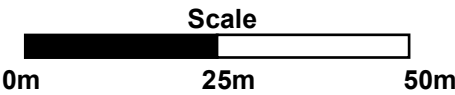
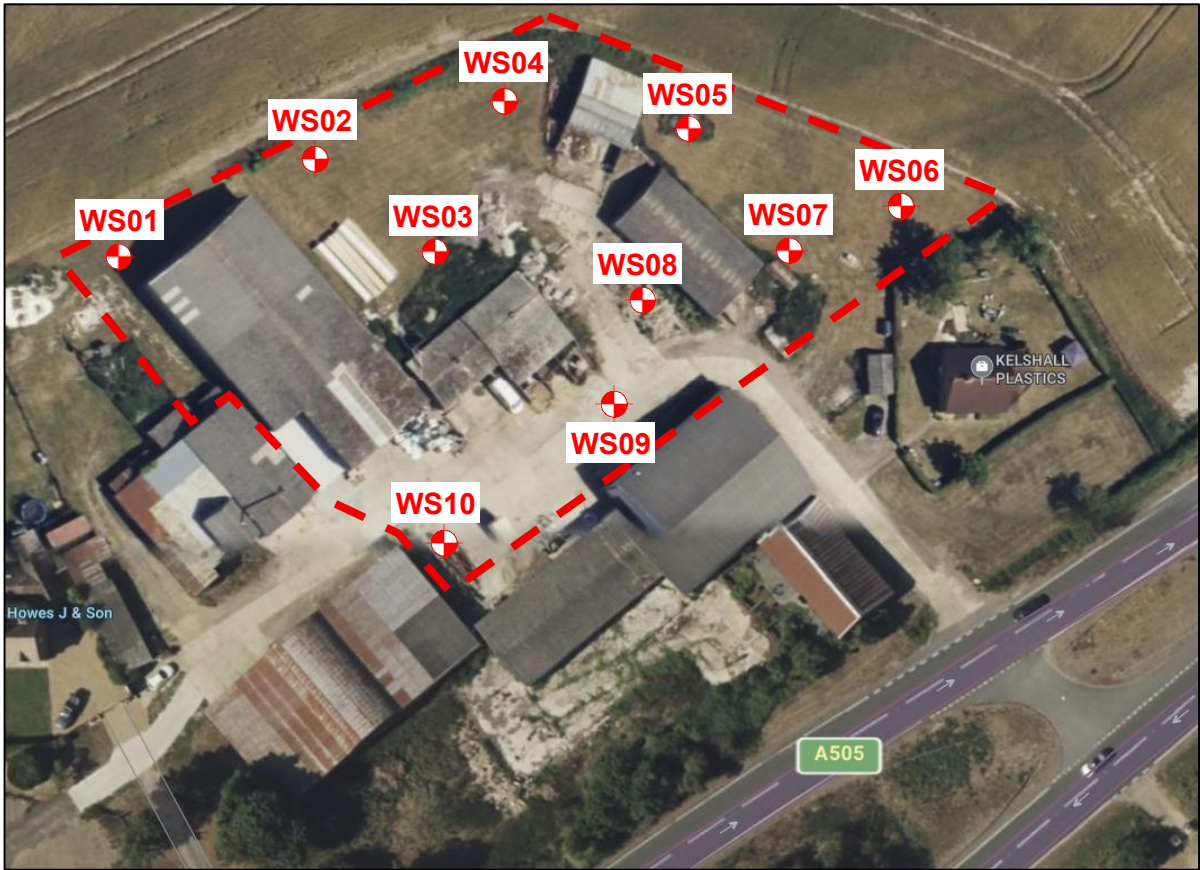


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Project No.
142400

Borehole Location Plan

Figure 2



KEY



Window sample boreholes WS01 to WS10

Project : Slip End Farm, Royston Road, Slip End, Baldock, Hertfordshire

Client : D. Northern and Sons Limited

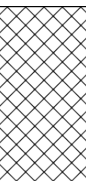
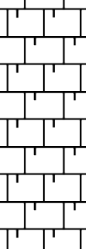
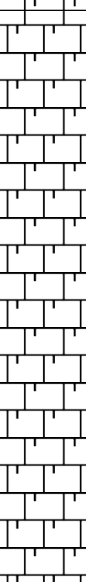


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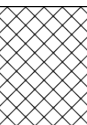
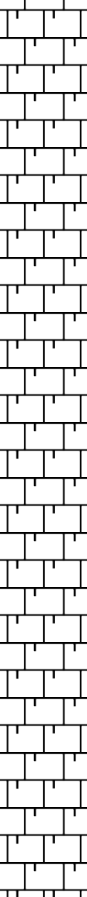
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142400

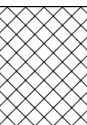
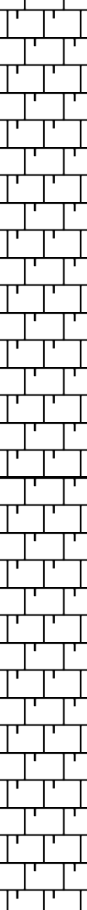
Appendix 1

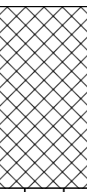
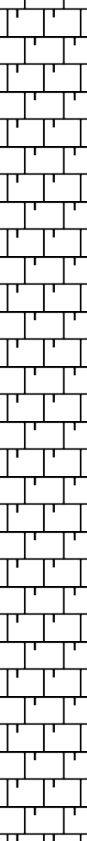
Records of Boreholes WS01 to WS10 Gas/Water Monitoring Results

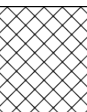
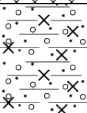
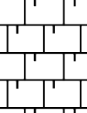
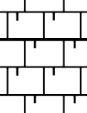
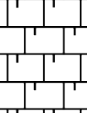
Lucion improving people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566			Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS01					
19/02/2026			Final Depth 3.45 m	Equipment Dynamic Sampling Rig								
Samples and In Situ Testing			Water Levels (Casing)	Stratum Description		Legend	Depth (m)					
Depth (m)	Type	Results										
0.30 0.30 0.50 0.50	D1 ES1 D2 ES2	N10 (3/1,2,3,4)		MADE GROUND - Firm, friable, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to sub-angular flint and chalk.			0.60					
(REWOREKED HEAD DEPOSIT)												
Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk.												
(WHITE CHALK SUBGROUP - GRADE DM)												
0.90 0.90	D3 ES3	N19 (7/5,4,5,5)		Structureless CHALK composed of white, very silty GRAVEL of angular chalk.			1.50					
(WHITE CHALK SUBGROUP - GRADE DC)												
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT	N37 (12/9,10,10,8)					3.45					
3.00 3.15-3.45	D6 SPT			End of Borehole at 3.45m								
Remarks				Hole Diameter by Depth		Project No.						
1. Starter pit excavated to 1.20m depth.				Depth (m)		142400						
2. Rootlets present to 0.60m depth.				Diameter (mm)		Scale: 1:25 Page 1/1						
				2.00 67								
				3.45 57								
KEY				Groundwater Strike		Groundwater Observations						
D - Disturbed Sample MP - Mackintosh Probe				Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks	Date	Depth (m)	Casing (m)	Water (m)
B - Bulk Sample V - Vane Shear Test									19/02/2026	3.45		Dry
U - Undisturbed Sample N/* - SPT Blows									25/03/2026	3.00	1.00	Dry
W - Water Sample ES - Environmental Sample									01/04/2026	3.00	1.00	Dry
S/C - SPT Spoon/Cone ▽ - Level On Completion									09/04/2026	3.00	1.00	Dry
⚡ - Water Strike ▽ - Level Casing Withdrawn												
⬆ - Water Rise ▽ - Standpipe Level												

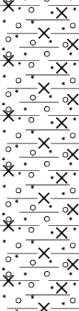
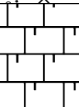
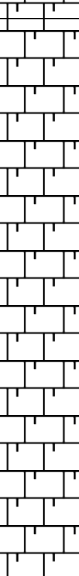
Lucion improving people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566				Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS02			
19/02/2026				Final Depth 3.45 m		Equipment Dynamic Sampling Rig					
Samples and In Situ Testing			Water Levels (Casing)	Well	Stratum Description	Legend	Depth (m)				
Depth (m)	Type	Results									
0.10 0.10	D1 ES1	N19 (7/5,4,5,5)		<							

 Lucion Powering people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566			Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS03					
			19/02/2026	Final Depth 3.45 m	Equipment Dynamic Sampling Rig							
Samples and In Situ Testing			Water Levels (Casing)	Stratum Description		Legend	Depth (m)					
Depth (m)	Type	Results										
0.30 0.30	D1 ES1	N18 (8/4,5,4,5)		MADE GROUND - Firm, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to sub-angular flint and chalk.			0.40					
				(REWORKED HEAD DEPOSIT)								
0.60 0.60	D2 ES2			Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk.								
0.90 0.90	D3 ES3											
1.20 1.20-2.00 1.35-1.65	D4 U1 SPT											
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT	N25 (7/4,7,6,8)										
3.00 3.15-3.45	D6 SPT	N34 (13/8,10,10,6)					3.45					
				End of Borehole at 3.45m								
Remarks						Project No. 142400						
1. Starter pit excavated to 1.20m depth.						Hole Diameter by Depth						
2. Rootlets present to 0.40m depth.						Depth (m)	Diameter (mm)					
						2.00 3.45	67 57					
						Scale: 1:25	Page 1/1					
KEY				Groundwater Strike		Groundwater Observations						
D - Disturbed Sample		MP - Mackintosh Probe		Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks	Date	Depth (m)	Casing (m)	Water (m)
B - Bulk Sample		V - Vane Shear Test							19/02/2026	3.45		Dry
U - Undisturbed Sample		N/* - SPT Blows										
W - Water Sample		ES - Environmental Sample										
S/C - SPT Spoon/Cone		▽ - Level On Completion										
 - Water Strike		▼ - Level Casing Withdrawn										
 - Water Rise		▼ - Standpipe Level										

Lucion Powering people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566			Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS04	
18/02/2026			Final Depth 3.45 m	Equipment Dynamic Sampling Rig				
Samples and In Situ Testing			Water Levels (Casing)	Stratum Description		Legend	Depth (m)	
Depth (m)	Type	Results						
0.30 0.30	D1 ES1	N21 (6/5,6,5,5)		MADE GROUND - Firm, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to sub-angular flint and chalk.			0.40	
(REWORKED HEAD DEPOSIT)								
Structureless CHALK composed of white, very silty GRAVEL of angular chalk.								
0.60 0.60	D2 ES2							
0.90 0.90	D3 ES3							
1.20 1.20-2.00 1.35-1.65	D4 U1 SPT							
(WHITE CHALK SUBGROUP - GRADE DC)								
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT	N19 (10/5,4,4,6)			Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk.			
(WHITE CHALK SUBGROUP - GRADE DM)								
3.00 3.15-3.45	D6 SPT	N19 (7/4,5,4,6)		End of Borehole at 3.45m			3.45	
Remarks				Hole Diameter by Depth		Project No.		
1. Starter pit excavated to 1.20m depth.				Depth (m)		142400		
2. Rootlets present to 0.40m depth.				Diameter (mm)		Scale: 1:25		
				2.00 3.45		67 57		
						Page 1/1		
KEY			Groundwater Strike			Groundwater Observations		
D - Disturbed Sample			Strike (m)			Date		
B - Bulk Sample			Rose To (m)			Depth (m)		
U - Undisturbed Sample			Casing (m)			Casing (m)		
W - Water Sample			Sealed			Water (m)		
S/C - SPT Spoon/Cone			Remarks			18/02/2026		
☒ - Water Strike						3.45		
▲ - Water Rise								
MP - Mackintosh Probe								
V - Vane Shear Test								
N/* - SPT Blows								
ES - Environmental Sample								
▽ - Level On Completion								
▼ - Level Casing Withdrawn								
▽ - Standpipe Level								

Lucion protecting people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566			Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS05					
18/02/2026			Final Depth 3.45 m	Equipment Dynamic Sampling Rig								
Samples and In Situ Testing			Water Levels (Casing)	Stratum Description		Legend	Depth (m)					
Depth (m)	Type	Results										
0.30 0.30 0.50 0.50	D1 ES1 D2 ES2	N6 (3/1,1,2,2)		MADE GROUND - Firm, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to sub-angular flint and chalk.			0.60					
(REWORKED HEAD DEPOSIT)												
Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk.												
0.90 0.90	D3 ES3	N13 (6/4,3,3,3)										
1.20 1.20-2.00 1.35-1.65	D4 U1 SPT											
(WHITE CHALK SUBGROUP - GRADE DM)												
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT	N17 (7/5,4,4,4)										
3.00 3.15-3.45	D6 SPT						3.45					
End of Borehole at 3.45m												
Remarks						Project No. 142400						
1. Starter pit excavated to 1.20m depth.						Hole Diameter by Depth						
2. Rootlets present to 0.60m depth.						Depth (m)	Diameter (mm)					
						2.00 3.45	67 57					
						Scale: 1:25	Page 1/1					
KEY				Groundwater Strike		Groundwater Observations						
D - Disturbed Sample		MP - Mackintosh Probe		Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks	Date	Depth (m)	Casing (m)	Water (m)
B - Bulk Sample		V - Vane Shear Test							18/02/2026	3.45		Dry
U - Undisturbed Sample		N/* - SPT Blows										
W - Water Sample		ES - Environmental Sample										
S/C - SPT Spoon/Cone		┐ - Level On Completion										
⚡ - Water Strike		┐ - Level Casing Withdrawn										
⬆ - Water Rise		┐ - Standpipe Level										

Lucion improving people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566				Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS06							
18/02/2026				Final Depth 3.45 m		Equipment Dynamic Sampling Rig									
Samples and In Situ Testing			Water Levels (Casing)	Well	Stratum Description	Legend	Depth (m)								
Depth (m)	Type	Results													
0.30	D1	N16 (4/4,3,4,5)			MADE GROUND - Firm, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to sub-angular flint and chalk.		0.40								
					(REWORKED HEAD DEPOSIT)										
0.60	D2				Firm, brown, gravelly, silty CLAY. Gravel of angular to rounded chalk.										
		(HEAD DEPOSIT)													
0.90	D3	N18 (6/6,4,3,5)			Structureless CHALK composed of white, very silty GRAVEL of angular chalk.		0.80								
1.20	D4														
1.20-2.00	U1														
1.35-1.65	SPT				(WHITE CHALK SUBGROUP - GRADE DC)		2.00								
2.00	D5	N18 (6/6,4,3,5)			Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk.		2.00								
2.00-3.00	U2														
2.15-2.45	SPT														
					(WHITE CHALK SUBGROUP - GRADE DM)		2.00								
3.00	D6	N24 (6/6,6,5,7)					3.45								
3.15-3.45	SPT														
					Beneath Installation		3.45								
					Beneath Installation										
					End of Borehole at 3.45m										
Remarks								Hole Diameter by Depth		Project No.					
1. Starter pit excavated to 1.20m depth. 2. Rootlets present to 0.40m depth. 3. Gas monitoring standpipe installed to 3.00m depth.								Depth (m)		Diameter (mm)		142400			
								2.00		77		Scale: 1:25		Page 1/1	
								3.45		67					
KEY					Groundwater Strike				Groundwater Observations						
D - Disturbed Sample		MP - Mackintosh Probe		Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks	Date	Depth (m)	Casing (m)	Water (m)			
B - Bulk Sample		V - Vane Shear Test							18/02/2026	3.45		Dry			
U - Undisturbed Sample		N/* - SPT Blows							25/03/2026	3.00	1.00	Dry			
W - Water Sample		ES - Environmental Sample							01/04/2026	3.00	1.00	Dry			
S/C - SPT Spoon/Cone		☒ - Level On Completion							09/04/2026	3.00	1.00	Dry			
☒ - Water Strike		☒ - Level Casing Withdrawn													
☒ - Water Rise		☒ - Standpipe Level													

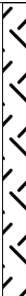
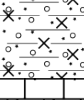
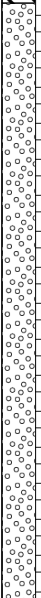
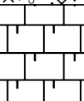
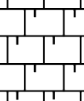
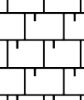
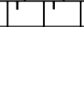
Lucion improving people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566 <td colspan="5">Site: Slip End Farm, Royston Road, Slip End, Baldock</td> <td colspan="2">WINDOW SAMPLE WS07</td>			Site: Slip End Farm, Royston Road, Slip End, Baldock					WINDOW SAMPLE WS07				
18/02/2026			Final Depth 3.45 m		Equipment Dynamic Sampling Rig							
Samples and In Situ Testing			Water Levels (Casing)	Stratum Description	Legend	Depth (m)						
Depth (m)	Type	Results										
0.10 0.10	D1 ES1	N18 (5/5,4,4,5)		MADE GROUND - Firm, dark brown, slightly sandy, slightly silty CLAY. Gravel of angular to sub-angular flint and chalk. (REWORKED HEAD DEPOSIT) Firm, brown, gravelly, silty CLAY. Gravel of angular chalk.		0.15						
0.60 0.60	D2 ES2			(HEAD DEPOSIT)								
0.90 0.90	D3 ES3											
1.20 1.20-2.00 1.35-1.65	D4 U1 SPT			Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk. (WHITE CHALK SUBGROUP - GRADE DM)			1.20					
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT	Structureless CHALK composed of white, very silty GRAVEL of angular chalk. (WHITE CHALK SUBGROUP - GRADE DC)		1.60								
3.00 3.15-3.45	D6 SPT	N25 (8/6,7,6,6)				3.45						
End of Borehole at 3.45m												
Remarks					Hole Diameter by Depth		Project No.					
1. Starter pit excavated to 1.20m depth.					Depth (m)		142400					
2. Rootlets present to 0.20m depth.					Diameter (mm)		Scale:					
					2.00		1:25					
					3.45		Page					
							1/1					
KEY			Groundwater Strike			Groundwater Observations						
D - Disturbed Sample			MP - Mackintosh Probe	Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks	Date	Depth (m)	Casing (m)	Water (m)
B - Bulk Sample			V - Vane Shear Test						18/02/2026	3.45		Dry
U - Undisturbed Sample			N/* - SPT Blows									
W - Water Sample			ES - Environmental Sample									
S/C - SPT Spoon/Cone			☒ - Level On Completion									
☒ - Water Strike			☒ - Level Casing Withdrawn									
☒ - Water Rise			☒ - Standpipe Level									



WINDOW SAMPLE
WS08

Final Depth
3.45 m

Equipment
Dynamic Sampling Rig

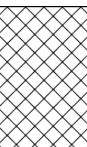
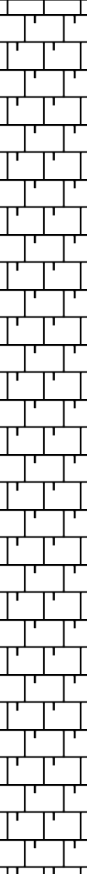
Samples and In Situ Testing			Water Levels (Casing)	Well		Stratum Description	Legend	Depth (m)	
Depth (m)	Type	Results							
0.10 0.10	D1 ES1	N24 (4/6,7,6,5)				MADE GROUND - Brown and black, silty SAND AND GRAVEL of angular brick, clinker, ash, flint and roadstone.		0.15	
						Firm, brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to rounded chalk.			
0.50 0.50	D2 ES2								
0.80 0.80	D3 ES3								
						(HEAD DEPOSIT)			
									
1.20 1.20 1.20-2.00 1.35-1.65	D4 ES4 U1 SPT	N21 (8/6,5,5,5)				Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk.		1.30	
									
									
									
									
									
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT	N29 (7/6,7,6,10)				(WHITE CHALK SUBGROUP - GRADE DM)		3.45	
									
									
									
									
3.00 3.15-3.45	D6 SPT								
						End of Borehole at 3.45m			

1. Starter pit excavated to 1.20m depth.
2. Gas monitoring standpipe installed to 3.00m depth.

Hole Diameter by Depth		Project No. 142400	
Depth (m)	Diameter (mm)		
2.00	87	Scale: 1:25	Page 1/1
3.45	77		

KEY		Groundwater Strike					Groundwater Observations			
D - Disturbed Sample	MP - Mackintosh Probe	Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks	Date	Depth (m)	Casing (m)	Water (m)
B - Bulk Sample	V - Vane Shear Test						18/02/2026	3.45		Dry
U - Undisturbed Sample	N/* - SPT Blows						25/03/2026	3.00	1.00	Dry
W - Water Sample	ES - Environmental Sample						01/04/2026	3.00	1.00	Dry
S/C - SPT Spoon/Cone	▮ - Level On Completion						09/04/2026	3.00	1.00	Dry
⚡ - Water Strike	▮ - Level Casing Withdrawn									
⬆️ - Water Rise	▮ - Standpipe Level									

Lucion Protecting people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566			Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS09		
19/02/2026			Final Depth 3.45 m	Equipment Dynamic Sampling Rig					
Samples and In Situ Testing			Water Levels (Casing)	Stratum Description		Legend	Depth (m)		
Depth (m)	Type	Results							
0.20 0.20 0.40 0.40	D1 ES1 D2 ES2	N19 (10/4,5,5,5)		MADE GROUND - CONCRETE.			0.10		
	MADE GROUND - Brown, clayey, sandy GRAVEL of angular to rounded flint and quartzite.				0.30				
	Firm, brown grey, silty CLAY. (HEAD DEPOSIT)				0.50				
	Structureless CHALK composed of white, slightly gravelly to gravelly SILT. Gravel of angular to sub-rounded chalk.								
0.80 0.80	D3 ES3	N27 (8/8,7,6,6)		(WHITE CHALK SUBGROUP - GRADE DM)					
1.20 1.20-2.00 1.35-1.65	D4 U1 SPT								
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT								
3.00 3.15-3.45	D6 SPT								
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
Remarks				Hole Diameter by Depth		Project No.			
1. Starter pit excavated to 1.20m depth.				Depth (m)		142400			
				2.00 3.45		77 67			
						Scale:	Page		
						1:25	1/1		
KEY				Groundwater Strike			Groundwater Observations		
D - Disturbed Sample				Strike (m)			Date		
B - Bulk Sample				Rose To (m)			Depth (m)		
U - Undisturbed Sample				Casing (m)			Casing (m)		
W - Water Sample				Sealed			Water (m)		
S/C - SPT Spoon/Cone				Remarks					
S/C - SPT Spoon/Cone									
S/C - SPT Spoon/Cone									
S/C - SPT Spoon/Cone									
S/C - SPT Spoon/Cone									
S/C - SPT Spoon/Cone									
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S/C - SPT Spoon/Cone									
S/C									

Lucion protecting people and planet LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566			Site: Slip End Farm, Royston Road, Slip End, Baldock				WINDOW SAMPLE WS10	
19/02/2026			Final Depth 3.45 m	Equipment Dynamic Sampling Rig				
Samples and In Situ Testing			Water Levels (Casing)	Stratum Description		Legend	Depth (m)	
Depth (m)	Type	Results						
0.30 0.30	D1 ES1	N24 (5/4,5,7,8)		MADE GROUND - Firm, dark brown, gravelly, silty CLAY. Gravel of angular to rounded flint and quartzite.			0.50	
0.60 0.60	D2 ES2			Structureless CHALK composed of white, very silty GRAVEL of angular chalk.				
0.90 0.90	D3 ES3							
1.20 1.20-2.00 1.35-1.65	D4 U1 SPT							
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT							
3.00 3.15-3.45	D6 SPT	N45 (15/15,11,8,11)		(WHITE CHALK SUBGROUP - GRADE DC)			3.45	
		End of Borehole at 3.45m						
Remarks				Hole Diameter by Depth		Project No.		
1. Starter pit excavated to 1.20m depth.				Depth (m) Diameter (mm)		142400		
				2.00 67		Scale:		
				3.45 57		1:25 Page		
						1/1		
KEY			Groundwater Strike			Groundwater Observations		
D - Disturbed Sample			Strike (m)			Date		
B - Bulk Sample			Rose To (m)			Depth (m)		
U - Undisturbed Sample			Casing (m)			Casing (m)		
W - Water Sample			Sealed			Water (m)		
S/C - SPT Spoon/Cone			Remarks					
☒ - Water Strike						19/02/2026		
▲ - Water Rise						3.45		
MP - Mackintosh Probe								
V - Vane Shear Test								
N/* - SPT Blows								
ES - Environmental Sample								
▽ - Level On Completion								
▼ - Level Casing Withdrawn								
▽ - Standpipe Level								

Gas and Groundwater Monitoring Results

Date	Borehole No.	CH4 (% v/v)		CO2 (% v/v)		O2 (% v/v)		Flow Rate (l/hr)		Atmos Pressure (mb)	Well Depth (m bgl)	Groundwater (m bgl)	Comments
		Peak	Steady	Peak	Steady	Minimum	Maximum	Peak	Steady				
25/03/2026	WS02	<0.1	<0.1	0.5	0.5	19.6	19.6	<0.1	<0.1	996	3.00	Dry	
01/04/2026	WS02	<0.1	<0.1	0.7	0.7	20.0	20.0	<0.1	<0.1	1010	3.00	Dry	
09/04/2026	WS02	<0.1	<0.1	0.9	0.9	20.0	20.0	<0.1	<0.1	1003	3.00	Dry	
25/03/2026	WS06	<0.1	<0.1	0.8	0.8	19.4	19.4	<0.1	<0.1	996	3.00	Dry	
01/04/2026	WS06	<0.1	<0.1	0.9	0.9	20.0	20.0	<0.1	<0.1	1010	3.00	Dry	
09/04/2026	WS06	<0.1	<0.1	1.2	1.2	19.8	19.8	<0.1	<0.1	1003	3.00	Dry	
25/03/2026	WS08	<0.1	<0.1	0.8	0.8	19.5	19.5	<0.1	<0.1	996	3.00	Dry	
01/04/2026	WS08	<0.1	<0.1	0.4	0.4	20.2	20.2	<0.1	<0.1	1010	3.00	Dry	
09/04/2026	WS08	<0.1	<0.1	0.7	0.7	20.0	20.0	<0.1	<0.1	1003	3.00	Dry	



LUCION GROUND ENGINEERING LTD.

Peterborough Tel : 01733 566566

Project: Slip End Farm, Royston Road, Slip End, Baldock

Client: D. Northern & Sons

Project No.

142400

Appendix 2

Laboratory Geotechnical Test Results

Lucion Ground Engineering Limited Summary of Test Results

Project No.	Project Name
142400	Slip End Farm, Royston Road, Slip End, Baldock

Sample					Density		Classification												Sulphates (SO4) 2:1				CBR					
Location	Ref	Top	Base	Type	Bulk	Dry	Moisture Content %			Class	LL	PL	PI	Retained on 425µm	Type	Max Deviator Stress kPa	Cell pressure kPa	Shear Strength kPa	Angle of Shear Resistance Degrees	Soil	Water	pH	Organic Content	Top	Base	Retained on 20mm	Hand Vane kPa	Remarks
		m	m				Mg/m ³	NMC	TRX											CBR	mg/l	mg/l	%	%	%	%		
WS01	D2	0.50		D			23		CI	39	22	17	15						74		7.7							
WS02	D2	0.50		D			23		CL	28	21	7	29						66		8.5							
WS03	D2	0.60		D			27		ML	32	27	5	43						206		8.5							
WS04	D3	0.90		D			30		ML	32	26	6	24						58		8.4							
WS05	D2	0.50		D			34		CI	40	20	20	11						140		8.2							
WS06	D2	0.60		D			26		CI	41	21	20	17						74		8.0							
WS07	D2	0.60		D			25		CI	40	21	19	22						107		8.0							
WS08	D3	0.80		D			19		CI	37	19	18	15						115		8.1							
WS09	D3	0.80		D			50		ML	31	25	6	11						99		8.4							
WS10	D2	0.60		D			24		ML	32	25	7	19						132		7.7							

Key

U - Undisturbed
D - Disturbed
B - Bulk
C - Core
W - Water

All tests performed in accordance with BS1377-2:2022 and BS EN ISO 17892 unless specified otherwise.

Sheet Reference: LGE Lab/C/1974 Iss 2 Rev 32

Appendix 3

Laboratory Chemical Test Results



Final Report

Report No.: 26-05475-1

Initial Date of Issue: 23-Mar-2026

Re-Issue Details:

Client *Lucion Ground Engineering Limited*

Client Address: *Newark Road
Peterborough
Cambridgeshire
PE1 5UA*

Contact(s): *John Gibb*

Project *142400 Slip End Farm*

Quotation No.: Q26-40647

Date Received: 25-Feb-2026

Order No.: PO26041

Date Instructed: 25-Feb-2026

No. of Samples: 10

Turnaround (Wkdays): 10

Results Due: 10-Mar-2026

Date Approved: 23-Mar-2026

Approved By:



Details: Simon Wicks, Specialist Chemist

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: 142400 Slip End Farm

Client: Lucion Ground Engineering Limited		Chemtest Job No.:				26-05475	26-05475	26-05475	26-05475	26-05475	26-05475	26-05475
Quotation No.: Q26-40647		Chemtest Sample ID.:				2088875	2088876	2088877	2088878	2088879	2088880	2088881
		Client Sample ID.:				D1	D1	D1	D1	D1	D1	D1
		Client Reference:				WS01	WS02	WS03	WS04	WS05	WS06	WS07
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.30	0.10	0.30	0.30	0.50	0.30	0.10
		Date Sampled:				19-Feb-2026	19-Feb-2026	19-Feb-2026	19-Feb-2026	19-Feb-2026	18-Feb-2026	18-Feb-2026
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
pH at 20C		M	2010		4.0	7.7	7.6	7.3	7.5	7.4	9.4	7.2
Moisture		N	2030	%	0.020	18	16	21	19	20	20	22
Stones and Removed Materials		N	2030	%	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.4	1.3	1.8	1.4	1.4	1.5	1.4
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.013	0.022	0.027	0.022	0.022	0.090	0.029
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	0.50	< 0.50	< 0.50	< 0.50	0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	4.0	2.9	5.4	2.8	2.8	7.5	6.7
Arsenic		M	2455	mg/kg	0.5	1.2	5.1	6.0	4.4	6.9	6.7	6.4
Cadmium		M	2455	mg/kg	0.10	0.18	0.16	0.18	0.15	0.60	0.64	0.24
Chromium		M	2455	mg/kg	0.5	4.7	9.2	6.6	8.3	11	12	18
Copper		M	2455	mg/kg	0.50	8.2	10	11	7.6	25	18	17
Mercury		M	2455	mg/kg	0.05	< 0.05	< 0.05	0.05	< 0.05	0.05	0.08	< 0.05
Nickel		M	2455	mg/kg	0.50	6.5	9.1	7.2	7.8	11	12	13
Lead		M	2455	mg/kg	0.50	16	15	17	14	66	54	29
Selenium		M	2455	mg/kg	0.25	< 0.25	0.32	< 0.25	< 0.25	< 0.25	0.35	0.32
Zinc		M	2455	mg/kg	0.50	53	44	96	34	270	210	110
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	3.1	3.0	3.9	2.0	4.2	5.2	5.5
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
ACM Type		N	2192		N/A	-	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Soil Colour		N	2030		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2030		N/A	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots
Soil Texture		N	2030		N/A	Loam	Clay	Clay	Clay	Clay	Loam	Clay
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic EPH >C10-C12	EH_2D_AL_#1	M	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	EH_2D_AL_#1	M	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Results - Soil

Project: 142400 Slip End Farm

Client: Lucion Ground Engineering Limited		Chemtest Job No.:	26-05475	26-05475	26-05475	26-05475	26-05475	26-05475	26-05475
Quotation No.: Q26-40647		Chemtest Sample ID.:	2088875	2088876	2088877	2088878	2088879	2088880	2088881
		Client Sample ID.:	D1	D1	D1	D1	D1	D1	D1
		Client Reference:	WS01	WS02	WS03	WS04	WS05	WS06	WS07
		Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):	0.30	0.10	0.30	0.30	0.50	0.30	0.10
		Date Sampled:	19-Feb-2026	19-Feb-2026	19-Feb-2026	19-Feb-2026	19-Feb-2026	18-Feb-2026	18-Feb-2026
		Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
Aliphatic EPH >C16-C21	EH_2D_AL_#1	M	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35	EH_2D_AL_#1	M	5002	mg/kg	3.00	< 3.0	< 3.0	4.5	3.5
Aliphatic EPH >C35-C40	EH_2D_AL_#1	N	5002	mg/kg	10.00	< 10	< 10	< 10	< 10
Aliphatic EPH >C40-C44	EH_2D_AL_#1	N	5002	mg/kg	1.00	1.6	2.0	1.7	1.7
Total Aliphatic EPH >C10-C35	EH_2D_AL_#1	M	5002	mg/kg	7.00	< 7.0	< 7.0	< 7.0	16
Total Aliphatic EPH >C10-C40	EH_2D_AL_#1	N	5002	mg/kg	10.00	< 10	< 10	< 10	17
Total Aliphatic EPH >C10-C44	EH_2D_AL_#1	N	5002	mg/kg	10.00	< 10	< 10	< 10	16
Aromatic EPH >C10-C12	EH_2D_AR_#1	U	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C12-C16	EH_2D_AR_#1	U	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C16-C21	EH_2D_AR_#1	U	5002	mg/kg	2.00	< 2.0	< 2.0	2.6	< 2.0
Aromatic EPH >C21-C35	EH_2D_AR_#1	U	5002	mg/kg	2.00	3.6	< 2.0	12	4.5
Aromatic EPH >C35-C40	EH_2D_AR_#1	N	5002	mg/kg	1.00	1.2	< 1.0	1.9	2.2
Aromatic EPH >C40-C44	EH_2D_AR_#1	N	5002	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	EH_2D_AR_#1	U	5002	mg/kg	4.00	4.6	< 4.0	14	5.6
Total Aromatic EPH >C10-C40	EH_2D_AR_#1	N	5002	mg/kg	10.00	< 10	< 10	16	< 10
Total Aromatic EPH >C10-C44	EH_2D_AR_#1	N	5002	mg/kg	10.00	< 10	< 10	16	< 10
Total EPH >C10-C35	EH_2D_Total_#1	U	5002	mg/kg	10.00	< 10	< 10	19	< 10
Total EPH >C10-C40	EH_2D_Total_#1	N	5002	mg/kg	10.00	10	< 10	21	13
Total EPH >C10-C44	EH_2D_Total_#1	N	5002	mg/kg	10.00	12	< 10	23	15
Naphthalene		N	5003	mg/kg	0.05	< 0.05	0.13	< 0.05	0.13
Acenaphthylene		N	5003	mg/kg	0.05	< 0.05	0.16	< 0.05	0.17
Acenaphthene		N	5003	mg/kg	0.05	< 0.05	0.23	< 0.05	0.24
Fluorene		N	5003	mg/kg	0.05	< 0.05	0.27	< 0.05	0.28
Phenanthrene		N	5003	mg/kg	0.05	< 0.05	2.0	< 0.05	2.1
Anthracene		N	5003	mg/kg	0.05	< 0.05	0.60	< 0.05	0.62
Fluoranthene		N	5003	mg/kg	0.05	< 0.05	3.4	0.10	3.5
Pyrene		N	5003	mg/kg	0.05	< 0.05	2.8	0.09	2.9
Benzo[a]anthracene		N	5003	mg/kg	0.05	< 0.05	1.8	< 0.05	1.8
Chrysene		N	5003	mg/kg	0.05	< 0.05	1.6	< 0.05	1.6
Benzo[b]fluoranthene		N	5003	mg/kg	0.05	< 0.05	2.5	0.07	2.5
Benzo[k]Fluoranthene		N	5003	mg/kg	0.05	< 0.05	0.85	< 0.05	0.89
Benzo[a]pyrene		N	5003	mg/kg	0.05	< 0.05	2.0	< 0.05	2.1
Indeno(1,2,3-c,d)Pyrene		N	5003	mg/kg	0.05	< 0.05	1.5	< 0.05	1.6
Dibenz(a,h)Anthracene		N	5003	mg/kg	0.05	< 0.05	0.27	< 0.05	0.28
Benzo[g,h,i]perylene		N	5003	mg/kg	0.05	< 0.05	1.2	< 0.05	1.2
Total Of 16 PAH's		N	5003	mg/kg	0.05	< 0.05	21	0.27	22

Results - Soil

Project: 142400 Slip End Farm

Client: Lucion Ground Engineering Limited		Chemtest Job No.:				26-05475	26-05475	26-05475
Quotation No.: Q26-40647		Chemtest Sample ID.:				2088882	2088883	2088884
		Client Sample ID.:				D2	D2	D1
		Client Reference:				WS08	WS09	WS10
		Sample Type:				SOIL	SOIL	SOIL
		Top Depth (m):				0.50	0.40	0.30
		Date Sampled:				18-Feb-2026	18-Feb-2026	18-Feb-2026
		Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
pH at 20C		M	2010		4.0	7.7	8.7	7.4
Moisture		N	2030	%	0.020	15	19	20
Stones and Removed Materials		N	2030	%	0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	2.1	1.1	12
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.067	0.081	0.11
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	2.8	21	14
Arsenic		M	2455	mg/kg	0.5	6.2	11	5.2
Cadmium		M	2455	mg/kg	0.10	0.22	0.80	0.20
Chromium		M	2455	mg/kg	0.5	13	35	8.4
Copper		M	2455	mg/kg	0.50	11	31	12
Mercury		M	2455	mg/kg	0.05	< 0.05	1.1	0.07
Nickel		M	2455	mg/kg	0.50	12	24	8.9
Lead		M	2455	mg/kg	0.50	16	160	24
Selenium		M	2455	mg/kg	0.25	0.31	0.86	< 0.25
Zinc		M	2455	mg/kg	0.50	71	210	140
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	1.5	8.2	3.4
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10
ACM Type		N	2192		N/A	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Soil Colour		N	2030		N/A	Brown	Brown	Brown
Other Material		N	2030		N/A	Stones	Stones, Roots and chalk	Stones
Soil Texture		N	2030		N/A	Clay	Clay	Loam
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Aliphatic EPH >C10-C12	EH_2D_AL_#1	M	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	EH_2D_AL_#1	M	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0

Results - Soil

Project: 142400 Slip End Farm

Client: Lucion Ground Engineering Limited		Chemtest Job No.:				26-05475	26-05475	26-05475
Quotation No.: Q26-40647		Chemtest Sample ID.:				2088882	2088883	2088884
		Client Sample ID.:				D2	D2	D1
		Client Reference:				WS08	WS09	WS10
		Sample Type:				SOIL	SOIL	SOIL
		Top Depth (m):				0.50	0.40	0.30
		Date Sampled:				18-Feb-2026	18-Feb-2026	18-Feb-2026
		Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
Aliphatic EPH >C16-C21	EH_2D_AL_#1	M	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35	EH_2D_AL_#1	M	5002	mg/kg	3.00	< 3.0	3.2	7.5
Aliphatic EPH >C35-C40	EH_2D_AL_#1	N	5002	mg/kg	10.00	< 10	< 10	< 10
Aliphatic EPH >C40-C44	EH_2D_AL_#1	N	5002	mg/kg	1.00	< 1.0	< 1.0	< 1.0
Total Aliphatic EPH >C10-C35	EH_2D_AL_#1	M	5002	mg/kg	7.00	< 7.0	< 7.0	9.3
Total Aliphatic EPH >C10-C40	EH_2D_AL_#1	N	5002	mg/kg	10.00	< 10	< 10	10
Total Aliphatic EPH >C10-C44	EH_2D_AL_#1	N	5002	mg/kg	10.00	< 10	< 10	< 10
Aromatic EPH >C10-C12	EH_2D_AR_#1	U	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0
Aromatic EPH >C12-C16	EH_2D_AR_#1	U	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0
Aromatic EPH >C16-C21	EH_2D_AR_#1	U	5002	mg/kg	2.00	31	3.2	< 2.0
Aromatic EPH >C21-C35	EH_2D_AR_#1	U	5002	mg/kg	2.00	120	18	13
Aromatic EPH >C35-C40	EH_2D_AR_#1	N	5002	mg/kg	1.00	33	< 1.0	2.9
Aromatic EPH >C40-C44	EH_2D_AR_#1	N	5002	mg/kg	1.00	7.5	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	EH_2D_AR_#1	U	5002	mg/kg	4.00	150	22	14
Total Aromatic EPH >C10-C40	EH_2D_AR_#1	N	5002	mg/kg	10.00	190	22	17
Total Aromatic EPH >C10-C44	EH_2D_AR_#1	N	5002	mg/kg	10.00	190	22	17
Total EPH >C10-C35	EH_2D_Total_#1	U	5002	mg/kg	10.00	160	25	23
Total EPH >C10-C40	EH_2D_Total_#1	N	5002	mg/kg	10.00	190	25	27
Total EPH >C10-C44	EH_2D_Total_#1	N	5002	mg/kg	10.00	200	25	28
Naphthalene		N	5003	mg/kg	0.05	< 0.05	< 0.05	0.27
Acenaphthylene		N	5003	mg/kg	0.05	0.08	< 0.05	3.2
Acenaphthene		N	5003	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Fluorene		N	5003	mg/kg	0.05	0.06	< 0.05	2.3
Phenanthrene		N	5003	mg/kg	0.05	0.82	0.07	2.8
Anthracene		N	5003	mg/kg	0.05	0.20	< 0.05	1.4
Fluoranthene		N	5003	mg/kg	0.05	1.7	0.23	4.4
Pyrene		N	5003	mg/kg	0.05	1.4	0.20	5.3
Benzo[a]anthracene		N	5003	mg/kg	0.05	1.1	0.11	0.71
Chrysene		N	5003	mg/kg	0.05	1.0	0.11	0.60
Benzo[b]fluoranthene		N	5003	mg/kg	0.05	1.4	0.15	< 0.05
Benzo(k)Fluoranthene		N	5003	mg/kg	0.05	0.52	< 0.05	< 0.05
Benzo[a]pyrene		N	5003	mg/kg	0.05	1.1	0.12	< 0.05
Indeno(1,2,3-c,d)Pyrene		N	5003	mg/kg	0.05	0.74	0.09	< 0.05
Dibenz(a,h)Anthracene		N	5003	mg/kg	0.05	0.16	< 0.05	< 0.05
Benzo[g,h,i]perylene		N	5003	mg/kg	0.05	0.55	0.07	< 0.05
Total Of 16 PAH's		N	5003	mg/kg	0.05	11	1.2	21

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos Quantification in Soils Sediments Ballast & Aggregate Crushed Concrete & Demolition Rubble	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
5002	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Hexane extraction / GCxGC FID detection	
5003	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Hexane / Acetone extraction GC-MS	

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Text example All items indicated in italic font represent customer-supplied information that may not be independently verified by the laboratory

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Where analysis is performed on a dried and crushed sample, it has been prepared by crushing all of the sample. If material has been removed prior to crushing, or by request of the client, this will be stated on the report.

NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Report Information

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water (Non-Regulatory)

GW - Ground Water

LE - Land Leachate

NA - Not Applicable

PL - Prepared Leachate

PW - Processed Water

RE - Recreational Water

SA - Saline Water

SW - Surface Water

TE - Treated Effluent

TS - Treated Sewage

UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up

MC - Mathematical Clean Up

FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis

EH - Extractable hydrocarbons – i.e. everything extracted by the solvent

CU - Clean-up – e.g. by Florisil, silica gel

1D - GC – Single coil gas chromatography

Total - Aliphatics & Aromatics

AL - Aliphatics only

AR - Aromatic only

2D - GC-GC – Double coil gas chromatography

#1 - EH_2D_Total but with humics mathematically subtracted

#2 - EH_2D_Total but with fatty acids mathematically subtracted

+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:

cs@etuki.eurofins.com

Appendix 4

Concrete Requirements Against Sulphate Attack

TABLE C2 – AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE

(ACEC) CLASSIFICATION FOR BROWNFIELD LOCATIONS^a

Table C2 Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations ^a								
Sulfate and magnesium						Groundwater		ACEC
Design Sulfate	2:1 water/soil extract ^b		Groundwater		Total potential sulfate ^c	Static water	Mobile water	Class for location
Class for location								
1	2	3	4	5	6	7	8	9
	(SO ₄ mg/l)	(Mg mg/l)	(SO ₄ mg/l)	(Mg mg/l)	(SO ₄ %)	(pH) ^d	(pH) ^d	
DS-1	< 500		< 400		< 0.24	≥ 2.5	> 6.5 ^d 5.5–6.5 4.5–5.5 2.5–4.5	AC-1s AC-1 AC-2z AC-3z AC-4z
DS-2	500–1500		400–1400		0.24–0.6	> 5.5 2.5–5.5	> 6.5 5.5–6.5 4.5–5.5 2.5–5.5	AC-1s AC-2 AC-2s AC-3z AC-4z AC-5z
DS-3	1600–3000		1500–3000		0.7–1.2	> 5.5 2.5–5.5	> 6.5 5.5–6.5 2.5–5.5	AC-2s AC-3 AC-3s AC-4 AC-5
DS-4	3100–6000	≤ 1200	3100–6000	≤ 1000	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4 AC-4s AC-5
DS-4m	3100–6000	> 1200 ^e	3100–6000	> 1000 ^e	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4m AC-4ms AC-5m
DS-5	> 6000	≤ 1200	> 6000	≤ 1000	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4s AC-5
DS-5m	> 6000	> 1200 ^e	> 6000	> 1000 ^e	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4ms AC-5m

Notes

- a** Brownfield locations are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).
- b** The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered from previous Digests (Box C7).
- c** Applies only to locations where concrete will be exposed to sulfate ions (SO₄), which may result from the oxidation of sulfides such as pyrite, following ground disturbance (Appendix A1 and Box C8).
- d** An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).
- e** The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000 mg/l and 17 000 mg/l). This allows 'm' to be omitted from the relevant ACEC classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that include the suffix 'z' have primarily to resist acid conditions and may be made with any of the cements in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

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