

SITE INVESTIGATION REPORT

PROPOSED REDEVELOPMENT:

DENVILLE HALL, 62 DUCKS HILL ROAD, NORTHWOOD, HILLINGDON HA6 2SB



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Report ref: **10767/JW_Rev3**

Date: **27th July 2026**

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DOCUMENT ISSUE STATUS:

Issue	Date	Description	Author	Checked / approved
Rev 0	27/10/22	First issue	James Williams MSc, BEng (Hons), FGS	Stuart Wagstaff BSc (Hons), MSc, FGS, CGeol, RoGEP
Rev 1	06/07/2026	Includes the results of additional shallow soil sampling, contamination testing and gas monitoring	James Williams MSc, BEng (Hons), FGS	Eve White BSc (Hons), MSc, FGS Stuart Wagstaff BSc (Hons), MSc, FGS, CGeol, RoGEP
Rev 2	20/07/2026	Includes remediation and discovery strategies	James Williams MSc, BEng (Hons), FGS	Eve White BSc (Hons), MSc, FGS Stuart Wagstaff BSc (Hons), MSc, FGS, CGeol, RoGEP
Rev 3	27/07/2026	Updated with independent verification of imported soil	Eve White BSc (Hons), MSc, FGS	Stuart Wagstaff BSc (Hons), MSc, FGS, CGeol, RoGEP

This investigation has been undertaken within the constraints of the client's instruction/contract, together with those set out in the 'General information, limitations and exceptions' section at the end of this report. The Soil Consultants Limited (SCL) 'Standard Terms of Appointment' are also included at the end of this report and these identify the contractual arrangements for the investigation. Conclusions or recommendations made in this report are limited to those which can be reasonably based upon the research and/or intrusive investigation work carried out. Any comments which rely on third-party information which has been provided to us are made in good faith and on the assumption that such information is accurate. SCL have not carried out independent validation of any third-party information. Any views or recommendations made by the authors are expressed solely on behalf of SCL and not as individuals.

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General Information, Limitations and Exceptions

Standard Terms of Appointment

APPENDIX A

Fieldwork, in-situ testing and monitoring

-  Foreword
-  Rotary auger borehole records
-  Dynamic sampler borehole records
-  Standard Penetration Test results
-  SPT hammer calibration certificates
-  Trial pit records
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-  Groundwater and gas monitoring results

Laboratory testing

-  Index property testing
-  Plasticity chart
-  Unconsolidated undrained triaxial test results (QUT)
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Ground profiles

-  Plot of SPT 'N' value and undrained cohesion versus level
-  Cross section through boreholes

Contamination and chemical testing

-  Foreword
-  General soil suite
-  PAH suite
-  PCB congeners suite
-  WAC test results
-  Sulphate/pH suite

Plans, drawings & photographs

-  Site photographs
-  Site survey drawing
-  Tree Constraints Plan (GHA Trees Arboricultural Consultancy drawing Rev A, dated June 2021)
-  Proposed development plans and sections
-  Site Plans
-  Location Plan

APPENDIX B

-  GroundSure historical maps (Ref SCL-8995153)
-  GroundSure Enviro+GeoInsight Report (Ref SCL-8995154)

1.0 INTRODUCTION

Consideration is being given to the redevelopment of parts of this site, including the demolition of a number of derelict buildings and the construction of several new two to three-storey buildings, one of which will incorporate a single level basement. In connection with the proposed works, Soil Consultants Ltd (SCL) were commissioned by Change Project Consulting Ltd, on behalf of the client, Denville Hall 2012 Ltd, to carry out a site investigation to include the following elements:

-  Stage 1 Tier 1 Preliminary Risk Assessment (Desk Study) including initial Conceptual Site Model (CSM)
-  Intrusive investigation to identify the ground sequence and groundwater conditions
-  Geotechnical and geo-environmental sampling and laboratory testing
-  Provision of advice on foundations, retaining walls, ground floor slabs and the feasibility of the use of soakaways
-  Stage 1 Tier 2 generic quantitative risk assessment and refined Conceptual Site Model (CSM)

Following completion of the initial site investigation in 2022 and a review of the results/conclusions by the consulting engineer, limited supplementary investigation and gas monitoring was instructed by the client and undertaken 2026.

This report includes a summary of the findings and conclusions of the Desk Study research and Preliminary Risk Assessment. It then describes the two phases of intrusive investigation undertaken, gives a summary of the ground conditions encountered and discusses various foundation options. The Stage 1 Tier 2 generic environmental appraisal is then provided, including a revised CSM, remediation and discovery strategy.

2.0 SITE DESCRIPTION

A summary description of the site and its general setting at the time of our original investigation is as follows:

Site location and setting	- Located on the western side of Duck’s Hill Road, within the London Borough of Hillingdon - NGR 508140E 191350N
Site dimensions	The site is irregular in shape, measuring approximately 125 (N-S) x 110m (E-W) across its centre
Site boundaries	Duck’s Hill Road to the east with woodland and residential properties beyond. Open fields to the west and residential properties/gardens to the north and south
Site description	- The site comprises the grounds of Denville Hall care home - The southern part of the site is occupied by the main building/facilities (Photo 1), which comprises a 16th Century house (rebuilt c.1850) which has been subsequently extended/redeveloped including a substantial two-storey extension c.2004. Access is via an asphalt driveway, flanked by tended grass areas, which leads to two discrete parking areas to the north of the main building. A large, tended lawn is present to the north-east of the main building which is bordered by an asphalt pathway on all sides (Photo 6) - The northern and eastern parts of the site are occupied two smaller, detached, derelict residential buildings, comprising a two-storey apartment block (Photo 7) and bungalow (Photo 2). Both buildings were set within grassed areas bordered by mature trees/vegetation - A bin/waste storage area is present at the northern end of the car park (Photo 4) and a small detached refrigeration/food storage unit is present adjacent to the main residential block (Photo 5) - A single-track drive connects the northern part of the site with Duck’s Hill Road to the northeast
Topography and site levels	- Topographical drawing supplied (Milton Keynes Surveys, Ref: 41975_1, dated July 2022) indicates the wider site to slope down to the south/south-east, from a maximum elevation of about +74.20mOD within the northern extent to a minimum of about +68.00mOD adjacent to the site’s junction with Duck’s Hill Road, at an overall slope angle of about three degrees - Ground floor level of the main building is between about +71.30m and +71.50mOD
Existing vegetation within site and adjacent properties	Numerous mature broadleaf and coniferous tree species are present within the site and on its boundaries. A tree survey (GHS Trees Arboricultural and Planning Integration Report, Ref GHA/DS/122660:21) indicates the presence of high water demand trees including oak and cypress, and moderate water demand species including sycamore, ash, pine and wellingtonia

The current site features are shown on the Site Plan and Site Photographs which are included in Appendix A.

3.0 STAGE 1 TIER 1 PRELIMINARY RISK ASSESSMENT (DESK STUDY)

This assessment is generally based upon current UK guidance, primarily the Environment Agency’s “Land contamination: risk management” 2020. The scope of the assessment is as follows:

- ✚ A review of historical and current land–use and potential contaminated land risks
- ✚ Development of an outline conceptual model, identifying potential sources, pathways and receptors
- ✚ Development of a strategy for intrusive investigation

3.1 Review of historical mapping

The following summary of the history of the site and surrounding area has been compiled from a series of historical maps (Groundsure Ref: SCL-8995153, 19/08/22) obtained from a commercially available database; these are included in Appendix B.

Historical development of site and surrounding area		
Map date	The site	Significant development / features in surrounding area
✚ 1864/1900	✚ The site is occupied by a single, substantial, property identified as Northwood Hall, part of which comprises a glass/greenhouse. Further large glass/greenhouses are present to the west ✚ The remainder of the site comprises deciduous and broadleaf woodland	✚ The immediate surrounding area generally comprises woodland to the west and a mixture of woodland and furze/pasture to the east ✚ A road/track is present along the south-eastern boundary ✚ Three buildings with nearby wells about 102m E ✚ Several ponds are present between 20m and 241m E/SE. Also present 131m NW ✚ Marsh land about 100m E which appears to have been landscaped
✚ 1911/1920	✚ A rectangular area is present within the centre of the site, bordered by a break of slope, (which roughly corresponds with the location of the contemporary lawn) indicating possible re-grading of the area	✚ Several detached properties between 60m and 173m NE ✚ A number of cuttings are shown within the area to the east formerly shown as woodland and furze/pasture

Historical development of site and surrounding area		
Map date	The site	Significant development / features in surrounding area
 1932/1965	 The site is identified as Denville Hall Home for Aged Actors and Actresses  Glass/greenhouses formerly within the western part no longer no longer present  Two large detached buildings, and several smaller ancillary buildings/structures, present within the northern and eastern parts of the site	 Residential development immediately north and south of site, and fronting Duck's Hill Road  Area labelled 'The Gravel Pits' 165m E
 1974/2003	 The main building has been significantly developed/extended to the west/north-west	 Electricity substations 22m SE and 54m N
 2010 to present	 Redevelopment of the main building (c.2004 based on anecdotal evidence)	 No significant changes apparent

3.2 Database information

The database report includes information of local activities encompassing a range of subjects related to land use, pollution, and geological/hydrological conditions. Our assessment of contaminative uses and other environmental issues relevant to the site and its surroundings is provided below. The full database report (Groundsure Ref: SCL-6753702, 01/05/20) is included as Appendix B and this should be read and understood fully in conjunction with this summary.

Past land use

-  Historical industrial land uses: numerous unspecified pits/ground workings and gravel pits within 250m, the nearest being 90m E
-  Historical tanks: nearest are unspecified tanks 44/49m S
-  Historical energy features: nearest are electricity substations 12m SE and 52m N
-  Historical petrol stations and garages: none within 500m

Waste and landfill

- Active and historical landfills: none within 500m
- Waste exemptions: 14m N (37-45 Ducks Hill Lane; using waste exemption)

Current industrial land use

- Recent industrial land uses: Electricity substations 25m SE and 56m N
- Current or recent petrol stations: none within 500m
- Licensed pollutant release (within 250m): 435m E (Par Four Service Station; unloading of petrol into storage)
- Licensed Discharges to controlled waters: 123m NE (Mallard Way; sewage discharges into Cannon Brooke)
- Pollution incidents: 87m NW (smoke and firefighting run-off; minor land impact, significant air impact)

Hydrogeology

- Superficial aquifer: 'Secondary A' Aquifer 416m NW
- Bedrock aquifer: 'Secondary A' Aquifer on site, 'Unproductive Aquifer' 14m W
- Groundwater vulnerability: Medium vulnerability on site. Leaching class 'Low'
- Groundwater abstractions: nearest is 484m SW (Northwood Pumping Station)
- Source Protection Zones: Type 2 Outer Catchment on site, Type 1 Inner Catchment 184m W

Hydrology

- Water Network (OS MasterMap): 11m SE (inland river), 217mE (lake or reservoir), 218m E (inland river)
- Surface water features/bodies: none within 250m
- WFD Surface water body catchments: River Pinn catchment on site

River and coastal flooding

- Risks of flooding (RoFRaS), historical flooding and flood defences: none identified within 250m
- No Zone 2 or 3 floodplains or flood defences within 50m

Surface water and groundwater flooding

- Surface water flooding: the highest risk on site (and within 50m) is 1 in 30 year – 0.3m-1.0m
- Groundwater flooding: the highest risk on site (and within 50m) is 'low'

Environmental designations

- SSSI: nearest is Ruislip Woods 720m S
- National Nature Reserves: nearest is Ruislip Woods 938m S
- Local Nature Reserves: nearest is Batchwood Heath 925m NW
- Designated Ancient Woodland: nearest is Top Wood/French Grove 723m W
- Green Belt: London area Green Belt on site
- Nitrate Vulnerable Zones: none within 2km

Visual and cultural designations

- Listed Buildings: 6m NE (The Cottage, Northwood)

Agricultural designations

- Agricultural Land Classification: Grade 3 agricultural land on site

Habitat designations

- Priority Habitat Inventory: numerous records of deciduous
- Habitat networks: Network Enhancement Zone 2 220m N

Geology

- Superficial geology: none recorded on site
- Bedrock geology: Lambeth Group (very low to moderate permeability clay, silt and sand) recorded on site. London Clay 14m W
- BGS boreholes: none identified within 250m
- Natural ground subsidence: moderate risk of shrink-swell clays; very low to negligible risks for all categories where identified

Mining, ground workings and natural cavities:

- Natural cavities: none identified within 500m
- Britpits: nearest is Northwood Pits (Type A surface mineral working) 208m E
- Surface ground workings: unspecified pit 32m SE and 90m E, unspecified ground workings 143m E, 160m E, 175m NE and 205m E. Numerous records of ponds within 250m, the nearest being 111m N
- Non-coal mining: small scale underground chalk mining may have occurred on site. Potential for localised difficult ground conditions are at a level where they should be considered
- Mining cavities: nearest is 667m N (chalk)

Radon

Less than 1% of properties affected, Radon protection measures not required

Soil chemistry

BGS estimated urban soil chemistry, extract as follows:

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	11	1.9	89	61	0.8	56	29	17	8
On site	12	2.1	99	68	0.7	62	31	18	8
On site	12	2.1	72	49	0.7	55	24	17	7
On site	12	2.1	106	73	0.7	58	33	18	8
On site	12	2.1	117	80	0.7	63	38	19	8
On site	12	2.1	79	54	0.7	62	24	17	6

Railway infrastructure and projects

No historical, current or proposed railways or tunnels within 250m

3.3 Other information

A contaminated land enquiry was lodged with Hillingdon Council. No response had been received at the time of compiling this report.

3.4 Walk-over survey

A site walk-over survey was undertaken on 22nd August 2022. A description of the general features of the site and the topography is provided in Section 2.0 above. From inspection of visible and accessible areas, a summary of specific features relevant to the land quality assessment is as follows:

Feature	Commentary
Electricity substations and transformers	None identified on site. Nearest is located about 20m S of site (Photo 10).
Fuel storage tanks	None present based on conversations with site management and on-site observations
Fuel interceptors	None observed
General chemical storage/waste	None observed
Invasive species	None observed
Evidence of gas protection	None observed
Surface water contamination	No surface/pooled water observed on site
Waste storage	Bin storage area and waste skip present within northern part of the site (Photo 4)
ACMs	None observed. Pre-2000 buildings may contain ACM's

3.5 Potential pollution linkages and Initial Conceptual Site Model

The information in the preceding sections has been used to undertake the Preliminary Risk Assessment and to compile the Initial Site Conceptual Model below. The assessment follows a risk-based approach, with the potential risks determined qualitatively using the 'source-pathway-receptor' linkage concept; a risk of harm may only exist where a plausible linkage is present. The assessment has been formulated based on the following table:

		Consequences			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

Definitions of the risks are summarised as follows:

-  **Very high:** high probability that severe harm could occur, or there is evidence that it is currently occurring. If realised, the risk could result in substantial liability. Urgent investigation/remediation
-  **High:** harm is likely to occur, realisation is likely to present substantial liability. Urgent investigation required. Remedial works may be required in short-term, will be in long-term
-  **Moderate:** possible that harm could arise, but unlikely to be severe. Investigation normally required to clarify risk and liability. Remedial works may be necessary in long-term
-  **Low:** possible that harm could occur, but this would at worst be mild
-  **Very low:** low possibility of harm, unlikely to be severe

The assessment has been carried out by identifying and evaluating the potential sources of contamination, the potential receptors and the plausible pathways for contamination migration are summarised as follows:

Potential sources of contamination

A summary of potential sources identified by our review of the above information is as follows:

-  **Made ground:** historical maps indicate potential re-grading of the site c.1911; therefore, made ground may be present
-  **Electricity substations:** 12m SE (1974-92), 52m N (1974-1984), 25m SE and 56m N (both current)
-  **Potentially infilled land:** Unspecified pits 32m SE and 90m E. Several ponds between 111m N and 132m N and between 21m and 131m E/SE. Former gravel pits 208m E

It should be noted that any developed, non-greenfield land is likely to contain made ground. This will probably be of uncertain or unknown origin and may contain contaminants that have not been specifically identified.

The assessed risks from these potential sources are summarised in the Initial Conceptual Site Model below.

Potential receptors

In the context of the proposed development, the following potential receptors have been identified:

-  Human health: inhabitants/users of building, construction workers, adjacent site users
-  Controlled waters: Secondary 'A' bedrock aquifer beneath site which may be in hydraulic conductivity with the underlying chalk aquifer. The site is within a Type 2 Source Protection Zone (outer catchment) and the nearest surface water feature is 11m SE. The site is assessed as being of **medium environmental sensitivity**
-  Building fabric and services: buried foundations, basement wall, potable water pipes

Plausible pathways

-  Ingestion of soil, dust or water
-  Inhalation of dust, gas or vapours
-  Direct physical contact with contaminated soil/water
-  Vertical and lateral migration of contamination including leaching
-  Chemical attack of building infrastructure, including water supply pipes
-  Migration of ground gas/vapour through permeable soils or open pathways

The Initial Conceptual Site Model and an estimate of the risk associated with each potential linkage is shown in the following table:

Source	Pathway	Receptor	Assessed risk and commentary / justification
On-site: contaminated soil and groundwater	Ingestion, contact, inhalation	End user, construction workers and infrastructure	Low / moderate risk: the PRA has identified made ground, associated with historical re-grading of the site, as the main potential contamination source. Pre-2000 buildings present on site which may contain asbestos
	Leaching from contaminated soils and migration in groundwater	Aquifer and surface water	Low risk: there is a Secondary 'A' bedrock Aquifer beneath the site, which may be in hydraulic conductivity with the underlying chalk aquifer. No significant onsite contamination sources were identified and therefore the risk to the aquifer is expected to be low. The site lies within a Type 2 Outer catchment SPZ and there are no nearby abstraction points; the nearest surface water feature is 11m distant
Off-site: contaminated soil	Lateral migration of contaminants to site in groundwater	End user	Low risk: main potential sources are the nearby electricity substations. These are considered to be of low/limited risk due to low mobility of PCBs in groundwater
On-site and off- site: ground gas and vapours	Lateral and vertical migration of gas/vapour	End-user and buildings	Low risk: low/limited risk of ground gas/vapours associated with made ground on site and nearby potentially infilled land. The site is not in a radon affected area

The overall risk rating for the site is assessed as being **Low**.

3.6 Recommendations for intrusive investigation

The Initial Conceptual Site Model identified potential pollution linkages resulting in the overall assessed risk rating of moderate. The following programme of intrusive investigation is recommended:

-  Suitable intrusive investigation to confirm the ground sequence, allow soil/water sampling and the installation of monitoring pipes
-  Made ground was identified by the PRA as the main potential contamination source, and therefore the investigation should provide general coverage of the site. Electricity substations present off-site are considered low risk
-  Soil and groundwater samples should be recovered where relevant and be analysed for a range of general contaminants to include metals/semi-metals, petroleum hydrocarbons, asbestos screening and specifically PCBs
-  Groundwater and gas monitoring

The Initial Conceptual Site Model should then be revised to include complete pollution linkages and outline mitigation/remedial measures should be identified, together with any requirements for additional investigation.

4.0 EXPLORATORY WORK AND LABORATORY TESTING

The ground investigation was carried out in two phases, in August 2022 and April 2026, and is described below.

4.1 Constraints of investigation

The 2022 investigation phase was carried out in accordance with the scope produced by London Structures Lab (dated 24.05.2022). This document determined the scope of the initial investigation and the locations of the exploratory points undertaken during this phase of investigation. The 2026 phase of investigation was constrained by the presence of protected root zones and a path bordering the investigation area.

4.2 Rotary auger boreholes

Two boreholes (BH01 and BH02) were completed using a specialist solid stem rotary auger drilling rig to a depth of 18.0m below ground level (bgl). In-situ testing (SPT) was carried out at regular intervals and the hammer Energy Ratio (Er) for the equipment used was 83%; the relevant certificate is appended. Disturbed/undisturbed samples were taken for geotechnical and geo-environmental testing, and PID headspace testing was carried out on shallow made ground and natural soil samples. A 50mm internal diameter combined water/gas monitoring pipe was installed in both boreholes to a depth of 5.0mbgl.

An additional shallow borehole (BH03) was constructed in order to facilitate basic falling head soakage testing. However, a significant thickness of made ground was identified at this locality and groundwater was encountered at 1.50m depth. In agreement with the structural engineers, soakage testing was undertaken within a dynamic sampler borehole (WS03).

4.3 Dynamic sampler boreholes

Three dynamic (windowless) sampler boreholes (WS01 to WS03) were completed using a tracked drilling rig to depths of between 4.0m and 5.0mbgl. Standard Penetration Tests (SPT) were undertaken at regular intervals and representative samples taken for geotechnical and environmental testing. The appended calibration certificate for the SPT equipment used indicates the Energy Ratio, Er, of 81%. Basic falling head soakage testing was undertaken in WS03 to assess the feasibility of full-scale soakage testing. 35mm internal diameter combined water/gas monitoring pipes were installed in WS01 and WS02 to depths of 4.0m and 5.0mbgl respectively. both boreholes to a depth of 5.0mbgl.

4.4 Hand excavated trial pits

Three trial pits (TP01 to TP03) were excavated using hand tools against the existing buildings to expose, and record details of, the existing foundations.

4.5 Shallow soil sampling

During the investigation undertaken in 2022, five shallow soil samples (S1 to S5) for contamination testing were obtained from within the proposed garden area using hand tools.

Following identification of potential contamination, an additional fifteen samples were taken for polycyclic aromatic hydrocarbon (PAH) testing which were obtained from shallow hand excavated pits (S101 to S112) in April 2026. The sampling locations were spaced in a 3m grid pattern around the location of S1 to assess the lateral extent/depth of PAH contamination identified at this location in 2022.

4.6 Groundwater and gas monitoring

A single groundwater/gas monitoring was carried following completion of the site works on 30th September 2022. Five additional visits were instructed by the client in 2026 and undertaken between 5th May and 26th June 2026.

4.7 Geotechnical laboratory testing

The following geotechnical laboratory testing was completed:

-  Index properties tests (Atterberg Limits)
-  Particle size distribution tests
-  Unconsolidated, undrained triaxial tests

4.8 Chemical and contamination testing

Selected soil samples were delivered to a specialist laboratory (DETS Ltd) and the following testing was carried out:

	General soil suite	-	8no samples
	Asbestos screening	-	8no samples
	PAHs	-	15no samples
	PCBs	-	1no sample
	Waste Acceptance Criteria (WAC)	-	2no samples
	Soluble sulphate/sulphur/pH analyses	-	10no samples

The engineering borehole records, trial pit logs and the laboratory testing results are included in Appendix A.

5.0 GROUND CONDITIONS

Published BGS information (1:50,000 and 1:10,000 scale maps) indicates that the site is underlain by the Lambeth Group which rests upon the Seaford and Newhaven Chalk Formations. This sequence was confirmed beneath a variable thickness of made ground, and is summarised as follows:

Stratum	Depth to base	Level at base	Thickness
Topsoil and made ground	Varies between 0.60m and 2.75m	Varies between +71.30mOD and +68.20mOD	Up to 2.90m
Geologically Re-worked Lambeth Group (Light greyish/orangish/bluish brown slightly gravelly silty CLAY)	Varies between 2.75m and 3.0m where proven; locally absent	Varies between +71.30mOD and +66.45mOD	Between 1.75m and 2.20m where proven
Lambeth Group clay (Bluish/orangish/reddish brown silty CLAY)	Varies between 3.0m and 4.75m where proven; locally absent	Varies between +68.90mOD and +64.45mOD	Between 0.90m and 3.30m where proven
Lambeth Group sand (Light greyish brown/greyish green silty SAND to sandy GRAVEL)	Between 9.00m and 10.50m where proven	Between +61.00mOD and +60.20mOD	Between 7.75m and 9.00m where proven
Seaford and Newhaven Chalk	Base not proven, extended to maximum borehole depth at 18.0m	Below +51.20mOD	Not proven

Detailed descriptions are presented on the exploratory hole records and the ground sequence is represented on the geological cross sections; this information is appended.

5.1 Made ground

Made ground was encountered beneath a nominal layer of dark brown topsoil and was present to depths of between about 0.60m and 2.90mbgl. These non-engineered soils typically comprised brown/dark brown clay with variable gravel of brick, flint, tile, chalk and charcoal, locally grading to brown/black ashy gravelly sand. A significant thickness of made ground within the central and northern part extents (WS02, BH02 and BH03) may indicate historical re-grading of the site. Indeed, some potential re-grading is shown on the historical maps c.1913-1914.

Standard Penetration Tests (SPT) 'N' values of between 4 and 9 were measured indicate low to high strength clay soils/loose to medium dense granular soils.

5.2 Lambeth Group clay

Natural clay soils that we consider represent the Lambeth Group were encountered beneath the made ground and, where the base was proven, extended to depths of between 3.0m and 4.75mbgl, attaining a maximum thickness of 3.75m in BH01. These clay soils appeared to be absent in BH03 and may have been removed/replaced, as evidenced by a significant thickness of made ground at this locality. The soils generally comprised light brown/reddish brown/orangish brown/bluish grey mottled silty clay with a variable flint gravel content and occasional calcrete pockets.

SPT 'N' values of between 6 and 23, and hand shear vane values of between 40kN/m² and >120kN/m² were recorded in the clay soils. However, we consider that some of the higher bound values (such as shear vanes values >120kN/m² in WS02 and WS03 and a triaxial result of 304kN/m² in BH01) probably reflect elevated soil strengths due to the presence of desiccation. On this basis, we consider the characteristic strength values are indicative of generally medium to high, locally low strength clay. Atterberg limit testing indicates the clay soils to be of generally intermediate plasticity (BS classification) and medium volume change potential (NHBC classification).

5.3 Lambeth Group sand

Granular soils of the Lambeth Group were encountered clay at depths of between 2.90m and 4.75mbgl and, where the base was proven, extended to depths of between 9.0m and 10.50mbgl, attaining a maximum thickness of 7.50m in BH02. These soils generally comprised light brownish and greenish grey silty gravelly sand grading into silty sandy flint gravel.

SPT 'N' values of between 24 and >50 (refusal), are indicative of a generally medium dense to dense, becoming very dense, state of compaction. Particle size distribution (PSD) analysis indicates a sand content of between 35% and 95%, with gravel varying between 6% and 51% and fines between 5% and 27%.

5.4 Seaford and Newhaven Chalk

Chalk was encountered below the granular soils of the Lambeth Group at depths of between 9.0m and 10.50mbgl, and was present to the maximum depth investigated (18.0mbgl).

The boreholes were constructed using the solid stem auger method, which provides SPT profiling but does not allow for determination of CIRIA chalk grades. Visual observations and logging indicated the disturbed samples to generally comprise off white to cream, comminuted chalk silt with variable intact chalk gravel content and rare flint nodules.

In-situ SPT 'N' values of between 13 and >50 (refusal) were recorded within the chalk, generally showing an increasing 'N' value with depth, which we consider indicates reasonably competent chalk.

5.5 Groundwater

Groundwater inflow was not observed during drilling with the boreholes remaining dry. However, groundwater was present in BH03 struck/standing at a depth of 1.50mbgl; we consider this probably represents a localised perched groundwater within a deep area of made ground at this location. The monitoring pipes were dry during post-fieldwork measurements undertaken on 29th September 2022. Of course, groundwater levels can vary seasonally and may be higher following periods of wet weather. It is recommended that the borehole installations are monitored periodically prior to construction.

5.6 Desiccation

A number of densely planted mature trees are present in close proximity to, and within, the proposed development areas. The tree survey information provided indicates species present to include high water demand oak, cypress and hawthorn, and moderate water demand ash, pine, sycamore, birch, beech and wellingtonia.

The site is assessed by the BGS to be in an area of 'moderate' hazard with regards to shrinking and swelling ground stability. Our investigation revealed the presence of generally medium volume change potential clay soils at shallow depth across the majority of the site, and therefore we consider this assessment should be upgraded to 'high' risk. In assessing desiccation, we have considered the measured soil strengths, moisture contents, the presence of roots and our visual observations. Based on the above the following observations are of note:

- ✚ Live roots observed within all boreholes (with the exception of BH02) to depths of between 2.00m and 3.00mbgl.
- ✚ Elevated shear strengths (hand shear vanes values of $>120\text{kN/m}^2$ and hand penetrometer results of $>6\text{kg/cm}^2$) to depths of 3.0m and 2.0mbgl in WS01 and WS02 respectively. Triaxial test result of 304kN/m^2 in BH01.
- ✚ Reduced moisture contents (generally $<15\%$) to depths of between 2.50m and 3.50mbgl in WS01 and WS03. Negative liquidity index values measured within the vast majority of clay samples tested.

On this basis, we consider that the shallow clay soils are desiccated, or at least partially desiccated, to depths of between about 2.00m and 3.50mbgl due to the presence of existing trees/vegetation. Our investigation has provided only limited coverage of the site, and it is self-evident that zones of desiccation may extend to greater depths in areas not covered by our investigation, and in particular close to the areas of closely spaced mature trees.

5.7 Existing foundations

Three trial pits (TP01 to TP03) were excavated to provide details of the foundations of the neighbouring building and boundary wall. The findings from the trial pits are included in the Appendix as briefly summarised below:

Trial pit	Location	Foundation base depth	Projection from face of adjacent wall	Bearing stratum
TP01	Derelict bungalow	0.70m	0.15/0.30m	Light orangish brown/grey mottled slightly gravelly clay – possible natural soils
TP02	Accommodation block	Not proven	>0.60m	Not proven
TP03	Derelict apartment building	1.20m	0.28/>0.5m	Light brown/grey mottled silty CLAY with occasional flint gravel

5.8 Environmental observations

No obvious olfactory or visual signs of soil or groundwater contamination were encountered in the boreholes or trial pits. PID headspace testing (for VOC concentrations) was undertaken on samples of made ground and natural soils during the sampling exercises and during subsequent monitoring - no elevated levels were noted.

6.0 GEOTECHNICAL ASSESSMENT

The proposed works at this site include the re-development of the wider site, including the demolition of several existing, derelict, buildings, and the construction three new buildings (linked via a glass covered walkways), landscaped areas and outdoor amenities. Based on the information provided, details of the proposed new buildings are as follows:

-  Building A: a detached two-storey building replacing an existing bungalow within the southern part of the site.
-  Building B: a detached three-storey building incorporating a partial single level basement beneath, replacing an existing two storey building within the northern part of the site.
-  Building C: a large single storey side extension to the existing main accommodation block, connected to both Building 'A' and Building 'B' via a glass covered walkway.

A plan showing the latest development proposals is presented in Appendix A. Foundation loads were not available at the time of compiling this report.

The investigation has revealed that beneath a variable thickness of topsoil and made ground (up to 2.90m in our boreholes) the natural Lambeth Group is present to depths of between 9.0m and 10.50mbgl, resting upon the Seaford and Newhaven Chalk which extends to at least 18.0m depth. The shallow Lambeth Group generally comprise an upper layer of geologically re-worked clay soils overlying 'in-situ' clay soils, both of which are at least partially desiccated; granular Lambeth group soils are present at depths of between 2.75m and 4.75m.

We understand that, due to protection orders on a number of the existing trees, the requirement for foundation excavations must be minimised within the designated Root Protection Areas (RPA). Therefore, where the proposed buildings are within the RPAs, traditional spread foundations are unlikely to be feasible. Whilst traditional spread foundations could theoretically be adopted if final design proposals indicate buildings are outside the RPA, our investigation has revealed the shallow clay soils to be desiccated to variable depths, and without a more comprehensive investigation we consider there is a significant risk of deep desiccation and associated shrink/swell movement. Therefore, we consider pile foundations would present the most practical solution. Notwithstanding this, where basements are proposed, spread foundations could be adopted, if formation level is below the zone of assessed desiccation or lies within granular non-shrinkable soils.

As with any site underlain by chalk, consideration will need to be given to the potential presence of solution features, and this is discussed further below.

6.1 Ground stability and chalk dissolution

Dissolution features within the chalk occur due to erosional processes during the last periglacial period/environment. The independent report commissioned from Groundsure (Ref: 8995154) collates information on historical mining and natural cavities recorded in the vicinity of the site and is included in Appendix B. The report indicates that there are no recorded natural cavities within 500m of site and it assesses the risk of potential for ground dissolution stability hazards as being 'negligible'. In addition to the Groundsure report we have undertaken a natural cavities risk assessment using Edmonds procedure (Engineering Geology Special Publications No.18, 2001); this assessment indicates that subsidence hazards are 'Very Low'.

With regards to mining and quarrying, the report indicates the nearest BGS 'BritPits' mineral site to be 208m east of the site (chalk pit); the nearest historical ground working is recorded 32m south-east. The potential for localised small-scale non-coal historical mining on site is considered to be at a level where the risk of localised 'difficult' ground conditions should be considered.

Our investigation has revealed chalk 'rockhead' at a depth of about 9.00m and 10.50mbgl. Whilst a detailed solution feature risk assessment was not within the scope of our investigation, we consider SPT 'N' values of between 13 and >50 (refusal) recorded to be indicative of relatively competent chalk.

Notwithstanding the above, it should be noted that the presence of solution features cannot be totally ruled out without a much more comprehensive investigation. Therefore, a careful watching brief should be kept during construction, and if anomalous ground conditions are encountered then specialist advice should be sought from geotechnical contractors experienced in providing options for further investigation and potentially additional remedial measures. Dynamic probing of the proposed pile locations/foundation lines would reduce the risk of unexpected ground conditions being encountered at a late stage during construction.

6.2 Buildings A and C

Proposed buildings A and C comprise new a detached two-storey apartment building and single storey café/dining extension to the main accommodation building respectively. Whilst structural loads are unavailable, we anticipate these structures would generate relatively low to modest loads. Pile foundations are considered the most appropriate foundation for these buildings due to the presence of RPAs and desiccation of the shallow clay soils.

Piled foundations

For the ground conditions encountered, we consider that CFA piles, bearing within the competent chalk, will present the optimum type although helical screw piles and / or driven piles could be considered subject to potential desiccation effects being overcome. The following table of coefficients may be used for the preliminary determination of pile resistance.

Shaft friction / adhesion

Stratum	Depth	Ultimate unit shaft friction, 'q _s ' (kN / m ²)
All soils to 3.50m depth	Up to 3.5m	Ignore
Lambeth Group (assume sand)	Between about 3.5m and 9.0m	25
Chalk	Below 9.0m depth	0.8 x σ _v '

Notes:

- Shaft friction in the chalk is calculated as $q_s = \sigma_v' \times \beta$, where $\beta = 0.45$ for CFA piles with part of the shaft in weak soils ($N < 20$). For well-constructed rotary bored piles a β value of 0.8 may be used in the chalk and the above shaft friction values in the chalk may be increased by about 80%
- Sequence based on BH01 ground conditions

Base resistance

Stratum	Depth	Ultimate base resistance, 'q _b '
Chalk	12m to 18m	'q _b ' = 1600kN/m ² Note that CIRIA C574 also recommends that the <u>allowable</u> base resistance (q _{all}) should not exceed 1000-1800kN/m ² for SPT 'N' >25. We recommend that q _{all} = 1600kN/m ² is adopted for preliminary design

Notes:

- The base resistance assumes SPT 'N' > 25

Under EC7 (BS EN 1997-1:2004 and UK National Annex) the limit states GEO and STR must be verified using Design Approach 1, which checks reliability with two different combinations of partial factors. The following partial factors are applicable to bored and CFA piles, to be used in conjunction with a Model Factor of 1.4:

Parameter			Combination 1			Combination 2			
			A1	M1	R1	A2	M1	R4	R4+
Permanent actions (G)	Unfavourable	γ_G	1.35			1.0			
	Favourable	$\gamma_{G, fav}$	1.0			1.0			
Variable actions (Q)	Unfavourable	γ_Q	1.5			1.3			
	Favourable	$\gamma_{Q, fav}$	0			0			
Material properties (X)		γ_M		1.0			1.0		
Base resistance (R_b)		γ_b			1.0			2.0	1.7
Shaft resistance (R_s)		γ_s			1.0			1.6	1.4
Total resistance (R_t)		γ_t			1.0			2.0	1.7
Tensile resistance ($R_{s,t}$)		$\gamma_{s,t}$			1.0			2.0	1.7

For guidance purposes, indicative pile resistances for CFA/bored piles are as follows, calculated using the above preliminary parameters and partial factors where relevant:

Pile diameter (mm)	Pile toe level (mOD)	Pile toe depth (m)	Compressive Resistance (kN)	
			Combination 1	Combination 2
300	+57.2	12	290	195
	+54.2	14	540	325
	+51.2	18	795	485
450	+57.2	12	465	325
	+54.2	14	870	520
	+51.2	18	1250	760

Notes:

- Concrete stress should be considered in the final design
- Pile toe depth is relative to existing ground level (approximately +69.2mOD)
- Pile resistances are given as a guide and do not constitute design recommendations

The design engineer must ensure that the correct comparisons are made between the properly factored Design Actions and Design Resistances. The above pile resistances have incorporated the required partial factors for ULS design but do not incorporate explicit checks on serviceability. The presence of shrinkable soils and trees close to the footprint of the proposed structures means heave precautions will be required, in accordance with NHBC Standards Sitework clause S4(c). In the above parameters table, we have recommended that all soils to 3.5m depth are ignored due to potential desiccation. The pile designer will need to assess potential tensile forces and specify appropriate reinforcement.

Whilst we do not consider chalk dissolution to be a significant risk at this site and no loose soils or voids associated with the presence of solution features have been identified in the boreholes, consideration must be given to the possibility of their presence and an appropriate contingency should be in place during piling should anomalous ground conditions be encountered. The piling contractor should assess the risk and prepare appropriate mitigation measures. It is also noted that a significant thickness of made ground is present in some areas and thus the possible presence of obstructions should also be taken into consideration.

A piling specialist must be consulted at an early stage to advise on the most appropriate pile type and to ultimately provide the final pile design. If pile testing is undertaken, it will be possible to apply lower partial factors.

6.3 Building B

Building B comprises a three-storey apartment block with a single level basement beneath. No structural loads are available, but we anticipate this structure would generate moderate to high loads. Either traditional spread foundations or a raft, bearing within the natural Lambeth Group at basement level, are considered appropriate to support this structure.

Basement excavation and retaining walls

Based on the information provided an excavation depth of about 3.60m will be required to form the basement, which we assume will comprise an RC box with the new basement walls and floor slabs providing long term support. The excavation is expected to encounter a variable thickness of made ground, possibly up to about 3.0m thick locally, overlying the Lambeth Group; based on our boreholes (BH03 and WS03), both granular and cohesive Lambeth group soil may be exposed at formation level. If space permits, it should be possible to construct the basement in an open battered excavation. Alternatively, sheet piles or contiguous bored piles would provide an alternative option for an embedded retaining wall, subject to any issues with noise/vibration being addressed.

Whilst groundwater was encountered at a depth of about 1.50m in BH03, we consider this probably represents a pocket of perched groundwater within the localised thick made ground, as water was not observed within the remaining boreholes constructed in close proximity (BH02 and WS03). A trial excavation is recommended to the full basement depth to confirm groundwater levels/flow volumes and excavation stability; this will assist in determining support requirements and any need for further control measures, such as sump pumping.

Careful selection of the appropriate design parameters will be needed, incorporating allowances for factors such as the presence of groundwater.

The following table of coefficients may be used for the preliminary design of the basement retaining wall:

Stratum	Bulk density (Mg / m ³)	Effective cohesion, c' (kN / m ²)	Effective friction angle, ϕ' (degrees)
Made ground	1.80	0	22
Lambeth Group (clay)	2.00	0	21
Lambeth Group (sand)	2.00	0	35

Eurocode 7 stipulates that partial material factors must be applied to the best estimates of geotechnical soil properties during the design stage. The design engineer must ensure that the correct comparisons are made between Design Actions and Design Resistances after the application of appropriate partial factors. The determination of appropriate earth pressure coefficients and the pattern of earth pressure distribution should be carried out by the geotechnical designer; these will depend upon the type/geometry of the wall and the overall design approach. Of course, where the retaining wall is constructed against a battered slope, the active earth pressures will also be determined by the type of backfill placed. The final wall design and working sequence/procedure should be undertaken by suitably qualified professionals.

Clay desiccation should be considered in areas close to existing vegetation, particularly along the northern elevation where there are trees present close to the proposed footprint, including a mature oak tree and line of conifers. Although the basement excavation is expected to extend beyond the zone of root influence from existing vegetation and will remove any seasonally-affected soils, the wall designer should address the possible risk of there being desiccated clays behind the wall and incorporate appropriate measures. Where an open excavation is used, any significantly desiccated/root-infested clay soils should not be used to infill behind the wall unless appropriate conditioning is undertaken to prevent any potential clay swelling and associated heave. Alternatively, a compressible material could be installed behind the wall as a safeguarding to reduce potential future swelling pressures which could occur.

Basement raft

We consider the natural Lambeth Group soils would offer a suitable bearing stratum upon which to construct a raft. At the time of compilation of our report, design pressures for the raft were not available; however, for this form of construction, we do not envisage that the UDL of the raft would exceed about 50kN/m². For a 3.6m dig, there would be a net unload of about 70kN/m² and hence it is unlikely that the new building load would generate a net increase in stress on the natural soils. If a UDL is not achievable and structural loads are concentrated as line or point loads these could be carried by thickenings within the basement slab subject to spread foundation design recommendations below.

Based on the borehole records there may be a very limited thickness of clay remaining above the granular soils across part of the footprint. Whilst in theory, there would be an element of heave and heave pressure from this clay, for the thickness involved, this is expected to be negligible for design purposes. The underlying granular soils would not exhibit the same heave characteristics. We do not anticipate that desiccation effects would require special precautions at basement level.

It will be necessary to consider uplift of the slab due to potential hydrostatic pressures and in this respect the guidelines incorporated in BS8102:2009 should be followed. The slab design will need to take account of potential seasonal fluctuations and/or accidental and flood conditions. Although the water levels are currently well below basement level (dry conditions to the base of all boreholes and within the installation from the investigation) the basement will be wholly within the clay stratum and thus accidental flood conditions could exist; indeed, there is potential for water to be present within the made ground which is currently standing at about 1.50m below ground level. We consider that a design water level at 1m below ground level would be appropriate which would result in a hydrostatic uplift pressure of about 25kN/m². This figure would need to be agreed with the local building control.

Basement spread foundations

The structural loads could be carried by discrete pad or strip foundations at basement level. At Formation level, both granular and cohesive Lambeth Group soils are expected to be exposed and therefore, where clay soils are present, foundation excavations should be deepened to bear within the underlying granular soils. Any effects of root growth and desiccation are not expected to adversely affect the design of foundations at basement level; however, foundation excavations should of course be inspected to ensure a suitable formation level has been achieved.

For preliminary assessment of the feasibility and sizing of foundations placed within the natural granular soils, an allowable bearing resistance of 150kN/m² would be appropriate; this would be applicable to moderate sized strip or pad foundations, say up to 2.5m width. As required by EC7, the design engineer must ensure that the correct comparisons are made between Design Actions and Design Resistances after the application of appropriate partial factors and using the final base geometry. For ULS design the bearing resistance should be determined, using undrained and/or drained analysis as appropriate, to calculate the degree of utilisation of the foundation (limit state GEO). SLS checks should be carried out using appropriate methods in accordance with current practice.

6.4 Ground floor slabs (Buildings A & C)

Our investigation has revealed up to 2.75m of non-engineered made ground generally overlying shrinkable clay soils. Therefore, suspended floor slabs should be adopted for new buildings where basements are not proposed, supported by the main foundations, and incorporating a suitable void beneath based on medium volume change susceptible soils.

6.5 Soakaways

A falling head infiltration test was undertaken within borehole WS03 at a depth of 4.0mbgl. The testing resulted in no measurable fall in the level of water over a period of about 2 hours, indicating the soils to be practically impermeable. On this basis, we consider that traditional soakaways, constructed within the shallow clay soils, are unlikely to provide a suitable method of disposing of surface run-off. The deeper, granular, layers of the Lambeth Group may provide higher infiltration rates; however, these may prove impractical to construct due to the depth of the granular soils. If shallow soakaways within the granular layers of the Lambeth Group are to be adopted, infiltration rates should be confirmed following full-scale testing in accordance with the BRE DG365 procedure. We consider a deep borehole soakaway, constructed within the underlying chalk, may provide a practical alternative, subject to guidance contained within CIRIA C574.

As the site lies above chalk the use of soakaways should be approved by the Environment Agency. As established above, this site is assessed as being low risk with respect to solution features. The guidance contained within CIRIA C574 should be followed and therefore soakaways must be placed a minimum distance of 10m from any existing or proposed structure.

6.6 Foundation concrete

Low concentrations of water-soluble sulphates (2:1 water/soil extract) were measured in selected made ground and natural soil and samples, with near neutral to slightly alkaline pH values. The results fall into Site Design Class DS-1 of Table C2 given in BRE Special Digest 1 (2005). We assess the site as having 'static' groundwater and this would result in an ACEC Site Class of AC-1s.

7.0 STAGE 1 TIER 2 ENVIRONMENTAL ASSESSMENT

This appraisal is generally based on the Environment Agency's 'Land contamination: risk management', 2020, adopting current UK practice which uses the Source-Pathway-Receptor methodology to assess contamination risks. For a site to be designated as contaminated a plausible linkage between any identified sources and receptors must be identified, i.e. whether significant pollution linkages (SPLs) are present. In considering the potential for contamination to cause a significant effect, the extent and nature of the potential source are assessed and pathways/receptors identified; without an SPL there is theoretically no risk to the receptors from contamination. The assessed risks to the various potential receptors are summarised in the tabulated Conceptual Site Model which forms Section 7.6 of this report.

7.1 Environmental setting and context

The site is underlain by a Secondary 'A' bedrock aquifer beneath site which may be in hydraulic conductivity with the underlying chalk (which is a principal aquifer). The site lies within a Source Protection Zone II and the nearest surface water feature is 11m from site.

The site is assessed as being of **Medium** environmental sensitivity.

7.2 Contamination sources and testing

The Preliminary Risk Assessment is presented in Section 3.6 and this identifies significant potential sources of contamination and the associated risks. The initial testing undertaken in 2022 comprised analysis of eight soil samples for a range of general contaminants which were considered to reflect the potential historical/current site usages and the potential sources. Specifically, analysis for PCBs was included to reflect the presence of an electricity substation 20m from the southern boundary.

The soil test results have been assessed where relevant against the DEFRA Soil Guideline Values (SGV) and Category 4 Screening Levels (C4SLs), together with the LQM/CIEH Suitable 4 Use Levels (S4ULs) for Human Health Risk Assessment in which Generic Assessment Criteria (GACs) have been derived from the CLEA Model (2nd Edition, 2009). The contamination testing was carried out specifically for the purpose of providing a general guidance evaluation for the proposed development. Reference should be made to the foreword to the appended contamination test results in order to fully understand the context in which this discussion should be viewed.

The redevelopment will comprise a combination of buildings/hardstanding and landscaped areas with its primary use as a care home facility. We have used, where relevant, the trigger levels for **Public Open Space (Residential)** to assess the results of the contamination testing.

Using the relevant the trigger levels, all of the results fell below the threshold values, with the following exception.

- ✚ **Benzo(a)pyrene:** a slightly elevated concentration of 6.53mg/kg was measured in one sample of made ground (S1 @ 0.2m depth), when compared to the C4SL threshold level of 5.7mg/kg for Soil Organic Matter of 6%.

The results of the initial testing undertaken in 2022 suggested that there was no significant contamination present at the sampling positions; however, a localised elevated Benzo(a)pyrene concentration was detected in sample S1 location in a grassed area of soft landscaping. Fifteen additional samples were obtained for PAH testing around this location in 2026. Concentrations of PAHs were below the respective GAC, indicating there is no widespread contamination present. It should be noted that there may of course be pockets of undetected contamination between exploratory points. |

Although Asbestos-Containing Materials (ACM) were neither observed on site nor identified in the samples examined, we note that buildings (especially those constructed before 2000) are a potential source of ACM. Furthermore, any made ground, construction or demolition materials on site may also contain ACM. These matters should be addressed in the preconstruction H&S plan prior to any demolition or earthworks.

The implications of these results are addressed in the revised Conceptual Site Model below.

7.3 Ground gas/vapour monitoring

The PRA identified a potential gas risk from potentially infilled land associated with historical ground workings/pits, the nearest being recorded about 30m south-east of site. Gas monitoring was undertaken on one occasion following completion of the initial investigation undertaken in 2022. As agreed with the client, a further five visits were instructed by the client in 2026.

During the single monitoring visit undertaken in 2022 a maximum carbon dioxide concentration of 5.0% was recorded in BH01, and concentrations of methane, hydrogen sulphide and carbon monoxide were below the instrument limit of detection. PID readings in the borehole installations were all <10ppm, with a maximum measurement of 5.0ppm in WS02. The maximum measured flow rate was 0.2 l/hr in WS01.

During the subsequent five visits undertaken in 2026, carbon dioxide concentrations of $\geq 5\%$ were measured in WS01 on two occasions corresponding to depleted oxygen concentrations; concentrations of carbon dioxide were generally low in all remaining boreholes. Methane concentrations were below the instrument limit of detection. Peak concentrations of hydrogen sulphide and carbon monoxide of up to 1ppm, were detected intermittently over the 2026 monitoring programme exceeding the screening criteria of the HSE Work Place Exposure Limits, adjusted for chronic exposure (as described in CIRIA C552 "Contaminated Land Risk Assessment: A Guide to Good Practice") of 0.125ppm and 0.5ppm respectively. PID readings in the borehole installations were all <10ppm, with a maximum measurement of 6.3ppm in WS01. The maximum measured flow rate was 0.2 l/hr in WS01 and BH01.

7.4 Disposal of excavated soils

A rigorous hazard assessment of the results was not within the scope of our investigation, but our preliminary conclusion from the contamination and WAC testing (where total polyaromatic hydrocarbons were elevated in one sample) is that the made ground will probably classify as non-hazardous waste with an 'inert' classification for the natural soils. Early consultations should be made with appropriate waste facilities or regulators to confirm the off-site disposal requirements.

The potential waste classifications are based on soil results. More than incidental quantities (~5%) of vegetation/large clumps of roots within soils will affect waste removal costs and may limit acceptability to receiving facilities. Vegetation should be segregated from waste soils and disposed of separately and appropriately.

8.0 REMEDIATION STRATEGY (STAGE 2 AND 3)

Our intrusive ground investigation identified the following Pollutant Linkage:

Benzo(a)pyrene: a slightly elevated concentration of 6.53mg/kg was measured in one sample of made ground (S1 @ 0.2m depth), when compared to the C4SL threshold level of 5.7mg/kg.

8.1 Options Appraisal (Stage 2)

Breaking the Exposure Pathway(s)

In terms of protecting human health (end users, ground workers and landscape planting), one potential option would be to break the pathway of potential exposure. As an example, this could involve placing a cover layer above any made ground/soil remaining in-situ in areas of sensitive end use (e.g. gardens, soft landscaping etc.). This example would break the relevant exposure pathway to the receptor without removing the actual source of contamination. However, this would require raising ground levels and there are mature trees present.

Source Removal

Removal of the source(s) of contamination (e.g. near surface soil/made ground etc.) coinciding with areas of sensitive end use (e.g. areas of soft landscaping etc.) would break the SPL in the long-term by removal of the actual source of contamination. This would create a void to be backfilled with suitable, validated landscaping soils.

Option Selection

Based on the scope of the proposed development, where the grassed area will retain its current form/use, we consider the proposed strategy should incorporate source removal (i.e. remove surface layers and made ground) and replacement with certified suitable material.

8.2 Removal of made ground in garden areas (Stage 3)

To remediate the elevated values of Benzo(a)pyrene in the soil we recommend that all soils within a 3m radius of position S1 are removed to a depth of 0.5mbgl; results from samples from exploratory points S101 to S112 validate the extent/sides of the required excavation.

Prior to implementation, the proposed remedial works are to be approved by the relevant regulator. During remedial works standard good practices should be adopted and the usual caution and vigilance should be applied so that unexpected contamination can be identified. If soil or groundwater contamination is suspected then specialist advice must be sought. Further information is provided in Section 8.9. The removal is to be verified by a validation report prepared by a Geo-environmental Specialist.

8.3 Validation plan

In order to verify that all the required Benzo(a)pyrene-impacted made ground has been removed to the required lateral extent and depth, the exposed surface of the excavation / reduced dig should be inspected and photographed by a Geo-environmental Engineer following removal of the soils and prior to placement of imported soils. Confirmatory samples (say, 2no) should be obtained from the base of the excavation and analysed for Benzo(a)pyrene to validate removal. Delineation samples S102 to S109 validate the sides of the excavation. The validation assessment criteria to which the results are to be compared is Public Open Space (Residential) for the corresponding Soil Organic Matter.

Photographs, including the measured depth to the base, are to be taken prior to placement of the separation membrane, subsoil and topsoil placement and a scale plan of the excavation for validation purposes should be undertaken by the contractor, which would be incorporated into the validation report to be produced on completion of the works. Waste transfer documentation related to spoil disposal should also be collated and presented as part of this work.

8.4 Replacement with certified clean topsoil / subsoil

Following confirmation that all the required made ground has been removed, certified clean topsoil / subsoil should then be placed to complete the landscaped area to finished levels. It is good practice for a permeable geotextile separation membrane to be placed below the base of the replacement soils to prevent soil mixing. Depending on the results of the base validation samples, this geotextile may be required to be of high visibility and specified tensile strength. Compliant documentation will be required for imported and/or site-won soils.

For the landscaping soils (topsoil/subsoil) to be purchased from suppliers and imported, in line with the British Standards, prior to purchase and importation the supplier shall provide details of the provenance and evidence of compliance to the Geo-environmental Engineer for approval (including laboratory testing results for at least one sample per soil type dated within a year of the intended date of import). Laboratory certificates provided by the supplier(s) will be assessed for compliance with an appropriate specification for the works, industry good practice and relevant British Standards, phytotoxic and suitability for use validation assessment criteria.

The contractor should provide delivery notes for every load/bag confirming provenance.

Planning condition 13 (iv) of the development requires independent chemical testing of all imported soils. It is recommended that a free returns policy for non-compliant imported soils is written into any contractual arrangements with suppliers.

The sampling methodology shall be recorded, a plan of the sampling locations is to be provided (to 1m accuracy, unless the stockpile footprint is <1m), together with descriptions of the soils (logged in accordance with BS:5930:2015+A1:2020) accompanied by dated, annotated photographs. It is considered acceptable to test stockpiled soils prior to placement and prior to reuse provided tracking information/diaries evidence the minimisation of potential for cross contamination and the degradation of soil properties in the intervening period.

Validation sampling and testing for soil imported to the site to finished areas of soft landscaping shall be sampled at a minimum frequency of one sample per 20m³, with a minimum of three samples to be taken per source per soil type.

Each sample shall be analysed at a UKAS accredited laboratory for the following parameters:

- ✚ Metals: arsenic, cadmium, chromium (trivalent and hexavalent), copper, nickel, lead, mercury, selenium and zinc
- ✚ pH
- ✚ Soil Organic Matter (SOM)
- ✚ Monohydric phenol
- ✚ Total cyanide
- ✚ Speciated Total Petroleum Hydrocarbons (TPH) Criteria Working Group (CWG) split into aliphatic and aromatic carbon bands (C5-C40) with benzene, toluene, ethylbenzene and xylenes [BTEX] plus methyl tert-butyl ether [MTBE])
- ✚ Speciated 16 No. Polycyclic Aromatic Hydrocarbons (PAHs)
- ✚ Asbestos screen
- ✚ A suite of phenoxy acidic and phenyl urea herbicides are also to be analysed if the provenance identifies them as potential contaminants

To assess human health risks via soil ingestion, dermal contact and inhalation, results of validation sampling shall be compared directly with the validation assessment criteria (VAC) detailed in the table below.

Parameter	VAC (mg / kg)
Asbestos (detection limit of <0.001% weight for weight)	No asbestos detected
Arsenic	37
Cadmium	3****
Chromium (III)	910
Chromium (VI)	6
Copper	200****

Parameter	VAC (mg / kg)
Lead	200
Mercury	1****
Nickel	110****
Selenium	250
Zinc	300****
Monohydric phenol	23
Total cyanide	24
Benzene	0.087
Toluene	6*
Ethylbenzene	6*
Total xylenes (m, p, o)	6*
Acenaphthene	100**
Acenaphthylene	100**
Anthracene	100**
Benzo(a)anthracene	7.2
Benzo(b)fluoranthene	2.6
Benzo(ghi)perylene	100**
Benzo(k)fluoranthene	77
Chrysene	15
Dibenzo(a, h)anthracene	0.24
Fluoranthene	100**
Fluorene	100**
Indeno(1,2,3-cd)pyrene	27
Phenanthrene	95
Pyrene	100**

Parameter	VAC (mg / kg)
Benzo(a)pyrene	2.2
Naphthalene	2.3
Aliphatic hydrocarbons C5-C6	42
Aliphatic hydrocarbons >C6-C8	100
Aliphatic hydrocarbons >C8-C10	27
Aliphatic hydrocarbons >C10-C12	130
Aliphatic hydrocarbons >C12-C16	500***
Aliphatic hydrocarbons >C16-C35	500***
Aliphatic hydrocarbons >C35-C40	500***
Aromatic hydrocarbons C5-C7	6*
Aromatic hydrocarbons >C7-C8	6*
Aromatic hydrocarbons >C8-C10	34
Aromatic hydrocarbons >C10-C12	74
Aromatic hydrocarbons >C12-C16	140
Aromatic hydrocarbons >C16-C21	260
Aromatic hydrocarbons >C21-C35	500**
Aromatic hydrocarbons >C35-C40	500**
Herbicides and pesticides	< Laboratory limit of detection
The VAC has been set as the model calculated Assessment Criteria with no signs of gross/potential contamination. * total for all BTEX from inert waste threshold ** total for all PAHs from inert waste threshold *** total for all TPH from inert waste threshold **** phytotoxic GAC for soils with >7 pH. If soils are to be imported from a donor site, additional and different (typically lower) criteria will be applicable, as per the CL:AIRE Materials Management Plan.	

The VAC are derived from phytotoxic risks, waste thresholds and GAC suitable for the proposed end use for soils containing 1% SOM which have been selected as the most conservative approach. Since topsoil is likely to be relatively high in organic content, should higher SOM be present, the Suitable for Use Levels (S4ULs) with corresponding SOM can be utilised for validation. In the event that any parameter fails the respective validation criterion, further investigation and assessment will take place as per the discovery strategy (Section 9.0).

The sampling methodology, logs, plans, laboratory analytical certificates, assessment findings and photographs of the soil placement locations and depths are to be provided for the validation report.

The thicknesses of topsoil and subsoil will be dependent upon planting/seeding/turfing however, a minimum topsoil thickness of 150mm is expected to be required by the landscaping contractor (except for wildflower seeding).

The contractor may wish to await the results of the validation testing prior to placing soils to minimise the potential risk of re-excavation.

8.5 Disposal of excavated soils

A rigorous hazard assessment of the results was not within the scope of our investigation, but our preliminary conclusion from the contamination testing (where total polyaromatic hydrocarbons were elevated in sample S1) is that the made ground will probably classify as non-hazardous waste. Early consultations should be made with appropriate waste facilities or regulators to confirm the off-site disposal requirements.

The potential waste classifications are based on soil results. More than incidental quantities (~5%) of vegetation/large clumps of roots within soils will affect waste removal costs and may limit acceptability to receiving facilities. Vegetation should be segregated from waste soils and disposed of separately and appropriately.

The Main Contractor must keep records and photographs of soil that is taken off site. Waste Duty of Care documentation comprising laboratory analytical certificates for the waste; photographs and descriptions; correspondence showing the data sent to and confirmation of acceptance by the receiving facility; waste carriers license for every haulier used; environmental permits/exemptions for all receiving facilities; waste transfer notes paired with matching receiving facility receipt for every load is to be retained in the project file for incorporation in the validation report.

8.6 Ground gas and vapour protection measures

Specialist gas protection measures appropriate to carbon dioxide, hydrogen sulphide and carbon monoxide gases should be incorporated in all new buildings to mitigate this potential contaminant linkage to human health of future site users.

On the basis of the gas monitoring results, we consider that Characteristic Situation 2 (low risk) is appropriate as described in CIRIA C665 "Assessing risks posed by hazardous ground gases to buildings", 2007 and gas protection measures including those appropriate for trace gases (carbon monoxide and hydrogen sulphide) will need to be incorporated accordingly.

The PRA indicated that the site is not within a surface radon affected area, with <1% of properties being affected. Using the source-pathway-receptor methodology, we would therefore expect the risk to be very low/negligible for buildings without basements. However, that current guidelines (UK National Radon Action Plan, OGL 2018) indicate that for “*workplaces below ground, which includes basement areas of buildings, mines and caves, the risk assessment should include radon measurements irrespective of the radon Affected Area status*”. It is generally not practical or possible to undertake radon measurement in advance of the works that will accurately reflect the likely conditions following development. Some form of specific radon protection would, even if only precautionary, therefore be required and this will need to be agreed with the regulators. Radon protection may not be required if the regulators deem and confirm this is not necessary based on local knowledge

The incorporation of radon protective measures within the design (as part of waterproofing) is often the most expeditious method of satisfying the regulator. In this respect, we recommend that early consultation is made with the appropriate radon officer/regulator to establish whether precautionary incorporation of radon protection measures is required or they can confirm protection is not deemed necessary.

8.7 Construction workers

Construction workers should wear standard PPE including protective gloves and overalls. Normal hygiene precautions should be observed.

8.8 Refined Conceptual Site Model

Taking into account the above discussion, the assessed risks to potential receptors identified in the PRA are summarised in the refined Conceptual Site Model (CSM) below. This includes the stated mitigation measures to render any SPLs inactive and reduce the risks to receptors to acceptable levels:

Source	Pathway	Receptor	Assessed risk, justification and measures to mitigate the risk to acceptable levels
On site: contaminated soil/water	Ingestion & direct contact	End user	Low: - The PRA identified made ground as the main potential contamination source. No visual or olfactory evidence of gross contamination was identified in any of the soil samples. - All measured concentrations were below the relevant threshold values in the samples tested (including made ground) except for slightly elevated Benzo(a)pyrene in S1. No elevated concentrations above threshold values were measured in additional close-centred samples obtained from around S1. - The proposed development will result in the removal of some of the made ground (ie the main identified potential contamination source) and development areas of the site will be covered by new floor slabs and areas of hardstanding, which will provide an effective barrier to end users. Therefore, the SPL to human health will be inactive in these areas. - The SPL to human health will be active in proposed landscaped areas, where elevated Benzo(a)pyrene was measured locally in sample S1. Risk to end users should be mitigated by the removal of all soils within a 3m radius of this position to a depth of 0.50m, and replacement with certified clean material; confirmatory testing (two samples) should be undertaken at the base of the excavation to validate removal. Samples from S101 to S112 validate the extent/sides of the required hotspot removal excavation
	Ingestion, contact & inhalation	Construction workers and third parties	Low: - The SPL to human health created by the presence of slightly elevated Benzo(a)pyrene will be active during construction. The risks to these receptors will be managed through health & safety procedures and CDM regulations - A careful watching brief should be kept during construction and if obvious or suspected contamination is encountered this should be dealt with prescriptively
	Leaching from contaminated soils and migration in groundwater	Aquifer and surface water	Low: - The site is assessed as being of 'medium' environmental sensitivity - A proportion of the made ground will be removed during construction and the new development will reduce the amount of water infiltration into the ground - A thick sequence of low permeability clay is present across much of the site which will reduce migration into the underlying aquifer

	Direct contact with soil/water	Building fabric and infrastructure	The effects of soluble sulphates and alkali/acidic ground are discussed in Section 6.4 of this report Detailed assessment of soil/groundwater contamination with respect to water supply pipes is outside the scope of this report. See the relevant water authority requirements and UKWIR 'Guidance for the selection of water supply pipes to be used in brownfield sites', 2010.
Off site: contaminated soil/water	Lateral migration of contaminants in groundwater	End-user and buildings	Low: No significant off-site sources identified by the PRA with the exception of the nearby electricity substation. No significant visual or olfactory evidence of contamination was noted in the samples recovered and the vast majority of measured concentrations were below relevant threshold values, including PCBs
On-site and off-site: ground gas & vapour	Lateral migration through strata, service runs and cracks in buildings	End-user and buildings	Low / Moderate: The PRA identified a low risk of ground gas/vapours from nearby potentially infilled land. Made ground is a potential source of ground gas. Gas monitoring undertaken suggests that CIRIA 665 CS2 (low risk) applies and appropriate gas protection measures will need to be incorporated The site is not within a radon affected area, and whilst the radon risk is assessed as being very low, radon monitoring and/or the inclusion of protective measures may be required by the regulator where confined spaces (i.e. a basement; Building B) are proposed. We recommend that the regulator is consulted to confirm their requirements

In conclusion, based upon the information reviewed and the results of the investigation, our assessment is that with the localised removal of soils within the area of soft landscaping containing slightly elevated benzo(a)pyrene concentrations and replacement with certified clean subsoil and topsoil and with the installation of appropriate gas protection measures, it should be possible to reduce the risks to acceptable levels.

A careful watching brief should be kept during construction to ensure that any potentially contaminated soil encountered is disposed of in a safe and controlled manner. Site workers should observe normal hygiene precautions when handling soils and if material suspected of being contaminated is identified during construction, this should be set aside under protective cover and further tests undertaken to verify the nature and levels of contamination present. If contamination is present, a full site re-assessment may be required and a contingency should be in place in this regard.

9.0 DISCOVERY STRATEGY

The investigation has provided general coverage of the areas of the site accessible at the time of the initial investigation and supplementary delineation investigation of a landscaped area. It is self-evident that there may be zones of contamination within the site which were not encountered. A careful watching brief should be kept during construction to ensure that any potentially contaminated soil/water encountered is disposed of in a safe and controlled manner. Site workers should be briefed to look for visual, olfactory or other evidence of ground contamination during piling, excavation and groundworks.

On the discovery of any suspicious pockets of soil/material/water during the redevelopment the area will be cordoned off and work will cease in the vicinity. If there is a risk of the contamination spreading/mobilising/causing greater impact, measures to prevent further migration and/or cross-contamination will be discussed with the geo-environmental specialist and the relevant action taken by the contractor. Site workers should observe normal hygiene precautions when handling soils/water and if soils suspected of being contaminated are identified during construction, this should be set aside on a protective surface and under protective cover with further tests undertaken to verify the nature and levels of contamination present. This should also apply to groundwater where pumping should cease and relevant professional advice sought.

A Discovery Strategy is appended which should be communicated to all construction workers / groundworkers.

If previously undiscovered widespread ground/groundwater contamination is found, then a full site re-assessment may be required and a contingency should be in place in this regard. If unexpected contamination is encountered, groundworks in the affected area should be stopped and only recommenced once any additional intrusive site investigation works and remedial measures have been agreed in writing with the Planning authority and thereafter fully implemented.

DISCOVERY STRATEGY
TO BE INCORPORATED IN CONSTRUCTION METHOD STATEMENT
DENVILLE HALL, 62 DUCK'S HILL ROAD, NORTHWOOD, HILLINGDON HA6 2SB

INTRODUCTION

The site is being redeveloped and a Discovery Strategy is to be implemented during the construction phase. The aim is to define a process to be undertaken on site in the event that previously unidentified pockets of ground contamination or suspicious objects are discovered during the development of the site. It is intended to be communicated to and understood by all on-site workers including new site workers during the development.

HOW TO IDENTIFY POTENTIALLY CONTAMINATED MATERIAL

A careful watching brief should be kept during construction to ensure that any potentially contaminated soil/water encountered is disposed of in a safe and controlled manner. Site workers should be briefed to look for visual, olfactory or other evidence of ground contamination during piling, excavation and groundworks. Examples might include:

- Looks oily and has an oily odour
- Solvent or organic type of odour
- Man made materials in soils which could contain chemicals, solvents, oils etc...
- Contains fragments of asbestos sheeting/lagging, coal/coke and clinker
- Subsurface concrete or metal structures

(This is not an exhaustive list and should be used as guidance only. If there is any uncertainty in the identification of potentially contaminative material then suitable professional advice should be sought)

PROCEDURE

On the discovery of any suspicious pockets of soil/material/water during the redevelopment the following procedure should be followed:

- | | |
|---|---|
| A | Site Personnel to immediately inform Site Manager. |
| B | The Site Manager will initially decide if the material is potentially contaminated and will inform the geo-environmental specialist (SCL). |
| C | The area will be cordoned off and work will cease in the vicinity. Site workers should observe normal hygiene precautions when handling soils/water. Soils suspected of being contaminated should be set aside on a protective surface and under protective cover with further tests undertaken to verify the nature and levels of contamination present. This should also apply to groundwater where pumping should cease and relevant professional advice sought. |
| D | SCL will attend site to sample material for laboratory testing and will attempt to quantify the volume. The Local Planning Authority and Contaminated Land Officer will then be notified if potentially contaminated material has been discovered. |
| E | In the event that laboratory results indicate unexpected ground contamination then the laboratory data and a Revised Remedial Strategy will be forwarded to the EHO for their approval. |
| F | The Revised Remedial Strategy will be implemented by the Main Building Contractor, or if necessary Remediation Specialists. |

If previously undiscovered widespread ground/groundwater contamination is found, then a full site re-assessment may be required and a contingency should be in place in this regard. If unexpected contamination is encountered, groundworks in the affected area should be stopped and only recommenced once any additional intrusive site investigation works and remedial measures have been agreed in writing with the Planning authority and thereafter fully implemented.



GENERAL INFORMATION, LIMITATIONS AND EXCEPTIONS

Unless otherwise stated, our Report should be construed as being a Ground Investigation Report (GIR) as defined in BS EN1997-2. Our Report is not intended to be and should not be viewed or treated as a Geotechnical Design Report (GDR) as defined in EN1997-2. Any 'design' recommendations which are provided are for guidance only and are intended to allow the designer to assess the results and implications of our investigation/testing and to permit preliminary design of relevant elements of the proposed scheme.

The methods of investigation used have been chosen taking into account the constraints of the site including but not limited to access and space limitations. Where it has not been possible to reasonably use an EC7 compliant investigation technique we have adopted a practical technique to obtain indicative soil parameters and any interpretation is based upon our engineering experience and relevant published information.

The Report is issued on the condition that Soil Consultants Ltd will under no circumstances be liable for any loss arising directly or indirectly from ground conditions between the exploratory points which differ from those identified during our investigation. In addition, Soil Consultants Ltd will not be liable for any loss arising directly or indirectly from any opinion given on the possible configuration of strata between the exploratory points, below the maximum depth of the investigation or where site conditions have changed since the exploratory work; such opinions, where given, are for guidance only and no liability can be accepted as to their accuracy. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in using this Report.

Comments made relating to groundwater or ground-gas are based upon observations made during our investigation unless otherwise stated. Groundwater and ground-gas conditions may vary with time from those reported due to factors such as seasonal effects, atmospheric effects and and/or tidal conditions. We recommend that if monitoring installations have been included as part of our investigation, continued monitoring should be carried out to maximise the information gained.

Specific geotechnical features/hazards such as (but not limited to) areas of root-related desiccation and dissolution features in chalk/soluble rock can exist in discrete localised areas - there can be no certainty that any or all of such features/hazards have been located, sampled or identified. Where a risk is identified the designer should provide appropriate contingencies to mitigate the risk through additional exploratory work and/or an engineered solution.

Where a specific risk of ground dissolution features has been identified in our Report (anything above a 'low' risk rating), reference should be made to the local building control to establish whether there are any specific local requirements for foundation design and appropriate allowances should be incorporated into the design. If such a risk assessment was not within the scope of our investigation and where it is deemed that the ground sequence may give rise to such a risk (for example near-surface chalk strata) it is recommended that an appropriate assessment should be undertaken prior to design of foundations.

Where spread foundations are used, we recommend that all excavations are inspected and approved by suitably experienced personnel; appropriate inspection records should be kept. This should also apply to any structures which are in direct contact with the soil where the soil could have a detrimental effect on performance or integrity of the structure.

Ground contamination often exists in small discrete areas - there can be no certainty that any or all such areas have been located, sampled or identified.

The findings and opinions conveyed in this Report may be based on information from a variety of sources such as previous desk studies, investigations or chemical analyses. Soil Consultants Limited cannot and does not provide any guarantee as to the authenticity, accuracy or reliability of such information from third parties; such information has not been independently verified unless stated in our Report. No liability will be accepted for changes to the ground and groundwater conditions which occur post investigation.

Our Report is written in the context of an agreed scope of work between Soil Consultants Ltd and the Client and should not be used in any different context. In light of additional information becoming available, improved practices and changes in legislation, amendment or re-interpretation of the assessment or the Report in part or in whole may be necessary after its original publication.

Unless otherwise stated our investigation does not include an arboricultural survey, asbestos survey, ecological survey or flood risk assessment and these should be deemed to be outside the scope of our investigation.

We will identify tree and plant species if possible, but a suitably qualified arboriculturalist/botanist should be consulted to provide definitive identification.

Where reference to 'topsoil' is made, this should be construed as any turf (if present) plus any obvious organic-rich/humic layer of soil beneath, which may or may not contain roots/rootlets. Unless otherwise requested, we do not provide a detailed description, undertake sampling/testing for classification purposes or provide a specific classification. The thickness of the 'topsoil' identified on our exploratory hole records is indicative only and should not be used for detailed volume or site strip calculations.

STANDARD TERMS OF APPOINTMENT OF SOIL CONSULTANTS LTD FOR GEOTECHNICAL SERVICES

- 1 Unless previously withdrawn, our offer remains valid for a period of sixty days from date of offer. If an instruction is given after the sixty days we reserve the right to reasonably adjust any cost associated with the project to reflect any variance on the original offer. In placing an instruction to proceed with exploratory work, whether directly from the Client or Client's representative, the Client is deemed to have accepted our Terms of Appointment.
- 2 Our offer is on the basis that free, unhindered access and working conditions are available and that the investigation can be completed in one visit, if applicable. Delays beyond our control will incur additional charges. If additional works outside our offer are required to facilitate the investigation these will be advised and any costs will be passed on to the Client.
- 3 In our quotation we will provide an estimate of any mobilisation period following an instruction to proceed. This estimate will be accurate at the time of quotation, but it should be noted that the mobilisation period may vary at a later date due to factors such as sub-contractor availability and workload.
- 4 In commissioning this work, the Client has a responsibility for the health, safety and welfare of operatives invited to undertake work on their site. The Client shall indemnify us in respect of any failure to fulfil their obligations in connection with all relevant and current Health and Safety Regulations.
- 5 The methods of investigation used have been chosen taking into account the constraints of the site including but not limited to access, space and budgetary limitations. Where it has not been possible to reasonably use an EC7 compliant investigation technique, or where a non-compliant technique has been specified, we will adopt practical and appropriate techniques to obtain indicative soil parameters.
- 6 Unless otherwise stated, our Report should be construed as being a Ground Investigation Report (GIR) as defined in BS EN1997-2. Our Report is not intended to be and should not be viewed or treated as a Geotechnical Design Report (GDR) as defined in BS EN1997-2. Any interpretation which is provided is for guidance only and must not be regarded as design or design recommendation.
- 7 Where excavation is required as part of the exploratory work, the Client shall provide drawings or plans showing accurate and complete locations of all underground services and structures. In performing our service, we shall take reasonable precautions to avoid damage to underground services or structures. We will not be responsible for any damage caused to underground services or structures and will not be liable for any claims for damage, expenses arising or losses unless the location of all underground services or structures are accurately shown on drawings and those plans have been provided to us in good time prior to commencement of the exploratory work. Risk to the Client can be further reduced by undertaking a scan of the site using a specialist underground scanning service which would be intended to identify traceable services at shallow depth.
- 8 With some sites, especially those in certain areas of London and other large towns and cities, there may be a risk of unexploded ordnance (UXO) being present. Unless otherwise stated our offer is on the basis that the Client or their representative provides a preliminary UXO risk assessment for the site. It should be noted that if the site is deemed to be in an area of risk then further measures will be required. These would normally comprise either a more detailed risk assessment and/or specialist site attendance by an EOD engineer. These measures can be commissioned either by the Client or Soil Consultants Ltd. If the Client requires, we would be pleased to obtain a preliminary risk assessment at cost+10%.
- 9 The Client will supply a site plan (to a rational scale), an indication of the scope and type of the proposed development and an indication of any relevant structural loading information.
- 10 Should the Client terminate the contract after instruction, we reserve the right to recover costs associated to work carried out between the time of instruction and the point of termination. Cancellation fees, and material costs shall be charged at cost plus 20% (+VAT). Engineer/technician time shall be charged at £95+VAT per hour and principal consultant/director time shall be charged at £125+VAT per hour.

- 11 The Report is issued on the condition that Soil Consultants Ltd will under no circumstances be liable for any loss arising directly or indirectly from ground conditions between the exploratory points which differ from those identified during the investigation. In addition Soil Consultants Ltd will not be liable for any loss arising directly or indirectly from any opinion given on the possible configuration of strata both between the exploratory points and/or below the maximum depth of the investigation; such opinions, where given, are for guidance only and no liability can be accepted as to their accuracy. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in using this Report.
- 12 If and when instructed, an agreed number of contamination tests will be carried out to give an outline assessment of potential contaminants. In some circumstances it may be necessary to recommend further monitoring, contamination testing and assessment and the scope of this work would be agreed with the Client. Notwithstanding this additional scope, local regulatory authorities may have specific requirements which need to be addressed. Unless otherwise agreed or stated our reporting will constitute neither a Quantitative Risk Assessment nor a Remediation Statement or Strategy.
- 13 Our reports are counter-checked by one of our suitably qualified and experienced engineers/geologists.
- 14 Notwithstanding anything to the contrary contained in these terms, our liability under or in connection with these terms whether in contract or in tort, in negligence, for breach of statutory duty or otherwise (other than in respect of personal injury or death) shall not exceed the sum equivalent to ten times our contract fee or £100,000 whichever is less in the aggregate for geotechnical and environmental matters unless otherwise agreed.
- 15 Without prejudice to any other exclusion or limitation of liability, damages, loss, expense or costs our liability for any claim or claims under this agreement be further limited to such sum as it would be just and equitable for us to pay having regard to the extent of our responsibility for the loss or damage giving rise to such claim or claims ("the loss and damage") and on the assumptions that:
 - (a) All other consultants, contractors, sub-contractors, project managers or advisers engaged in connection with the Project have provided contractual undertakings to the Client on terms no less onerous than those set out in the original contracts in respect of the carrying out of their obligations in connection with the Project; and
 - (b) There are no exclusions of or limitations of liability nor joint insurance or co-insurance provisions between the Client and any other party referred to in this clause and any such other party who is responsible to any extent for the loss and damage is contractually liable to the Client for the loss and damage; and
 - (c) All such other consultants, contractors, sub-contractors, project managers or advisers have paid to the Client such proportion of the loss or damage which it would be just and equitable for them to pay having regard to the extent of their responsibility for the loss and damage.
- 16 Further and notwithstanding anything to the contrary contained in this agreement and without prejudice to any provision in this agreement whereby liability is excluded or limited to a lesser amount, our liability under or in connection with this agreement whether in contract or in tort, in negligence, for breach of statutory duty or otherwise for any claim shall not exceed the amount, if any, recoverable by us by way of indemnity against the claim in question under professional indemnity insurance taken out by us and in force at the time that the claims or (if earlier) circumstances that may give rise to the claim is or are reported to the insurers in question. The limitation shall not apply if no such amount is recoverable due to us having been in breach of our obligations or the terms of any insurance maintained in accordance therewith or having failed to report any such claim or circumstances to the Insurers in question timeously.
- 17 Whilst our investigation may include asbestos screening/quantification on selected samples, this must not be deemed to constitute a full asbestos survey or be taken as sufficient to definitively identify the presence or quantity of asbestos within or on the ground. We will not accept responsibility if asbestos is encountered during any subsequent construction or development works and in placing a contract with us the Client accepts this condition. Where the fabric of a building is to be disturbed, the Client shall provide an appropriate asbestos survey to us prior

to exploratory work and make adequate provision to allow the implementation of sufficient and appropriate protective/remedial measures for the work to progress safely.

- 18 Where our report refers to 'topsoil', this should be construed as any turf (if present) plus any obvious organic rich/humic layer of soil beneath, which may or may not contain roots/rootlets. Unless otherwise requested, we do not provide a detailed description, undertake sampling/testing for classification purposes or provide a specific classification. The thickness of the 'topsoil' identified on our exploratory hole records is indicative only and should not be used for detailed volume or site strip calculations; if this type of classification is required, this should be identified to us at an early stage and the method of sampling, testing and classification agreed.
- 19 The Client agrees that they shall not bring any claim personally against any director/employee of Soil Consultants Ltd or consultant to us in respect of loss or damage suffered by the Client arising out of this contract.
- 20 Our appointment shall be under simple agreement and our liability under this contract or in tort shall be for a period of six years from date of appointment.
- 21 Our reports are non-assignable and are prepared for the benefit of the Client. No reliance can be assumed by others without written agreement from Soil Consultants Ltd. We will provide a letter of reliance at our discretion and this will be subject to payment of our fee, which will be 10% of contract value, subject to a minimum fee of £1,250 plus VAT. The terms of our letter of reliance are non-negotiable and the beneficiary should be aware that the information shall only apply to the scheme for which the report was originally produced and the original rights and benefits will apply.
- 22 A VAT invoice (at current rate) will be presented in respect of the work undertaken. Payment of our account is to be made within twenty-eight days of issue of our invoice unless otherwise agreed. On no account shall payment be on a 'pay-when-paid' basis. The information contained within our report remains the property of Soil Consultants Ltd and no reliance may be assumed by any party with an interest in the project until payment has been received in full. After one calendar month interest shall be chargeable at 10% above the Bank of England Rate and compensation claimed in accordance with 'Late Payments of Commercial Debts (Interest) Act 1998 and subsequent revisions. If the debt is referred to a debt collection agency then we have the right to recover associated fees under the terms of our contract.

APPENDIX A

Fieldwork, in-situ testing and monitoring

-  Foreword
-  Rotary auger borehole records
-  Dynamic sampler borehole records
-  Standard Penetration Test results
-  SPT hammer calibration certificates
-  Trial pit records
-  Shallow sample summary
-  Groundwater and gas monitoring results

Laboratory testing

-  Index property testing
-  Plasticity chart
-  Unconsolidated undrained triaxial test results (QUT)
-  Particle size distribution tests

Ground profiles

-  Plot of SPT 'N' value and undrained cohesion versus level
-  Cross section through boreholes

Contamination and chemical testing

-  Foreword
-  General soil suite
-  PAH suite
-  PCB congeners suite
-  WAC test results
-  Sulphate/pH suite

Plans, drawings & photographs

-  Site photographs
-  Site survey drawing
-  Tree Constraints Plan (GHA Trees Arboricultural Consultancy drawing Rev A, dated June 2021)
-  Proposed development plans and sections
-  Site Plans
-  Location Plan

FOREWORD FOR ROTARY AUGER DRILLING - GUIDANCE NOTES

GENERAL

The borehole records are compiled from the driller's description of the strata encountered, an examination of the samples by our geotechnical engineer and the results of in-situ and laboratory tests. Based on these data, the report presents an opinion on the configuration of strata within the site. However, such reasonable assumptions are given for guidance only and no liability can be accepted for changes in conditions not revealed by the boreholes.

BORING METHODS

The rotary auger technique uses a solid-stems auger of 125mm diameter. The auger comprises 1m segments which are drilled into the ground and withdrawn in 1m increments for sampling. Casing can be utilised as required. The technique allows the ground conditions to be reasonably well established although disturbance of the ground is inevitable, particularly some "softening" of the upper zone of clay immediately beneath a granular soil. The presence of thin layers of different soils within a stratum may not always be detected.

GROUND WATER

The depth at which ground water was struck is entered on the borehole records. However, this observation may not indicate the true water level at that time. Due to the speed of boring and the relatively small diameter of the borehole, natural ground water may be present at a depth higher than the water strike. Moreover, ground water levels are subject to variations caused by changes in the local drainage conditions and by seasonal effects. When a moderate inflow of water does take place, boring is suspended for at least 10 minutes to enable a more accurate short-term water level to be achieved. An estimate of the rate of inflow is also given. This is a relative term and serves only as a guide to the probable flow of water into an excavation. Further observations of the water level made during the progress of the borehole are shown including end of shift and overnight readings and the depth at which water was sealed off by the borehole casing, if applicable.

SAMPLES

Undisturbed samples of predominantly cohesive soils are obtained using a 100mm diameter open-drive sampler. In granular soils, disturbed bulk samples are taken and placed in polythene bags. Small jar samples are taken at frequent intervals in all soils for subsequent visual examination. Where ground water is encountered in sufficient quantity, a sample of the ground water can also be taken.

IN-SITU STANDARD PENETRATION TESTS (SPT)

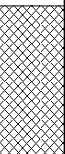
This test is performed in accordance with the procedure given in BS EN ISO 22476-3:2005. The individual blow count record for each test is given on a separate table. The 'N' value is normally the number of blows to achieve a penetration of 0.3m following a seating distance of 0.15m and is quoted at the mid-depth of the test zone. However if a change of stratum occurs within the test zone then a revised 'N' value can be calculated to assess one layer in particular. In hard strata full penetration may not be obtained. The presence of groundwater and particularly Where groundwater can affect the test and the measured values may not represent the true in-situ density of the soil.

Site & Location: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB							Borehole No: BH01	
Client: Denville Hall 2012 Ltd					Coordinates: 508145E, 191330N		Sheet 1 of 2	
Engineer: London Structures Lab					Ground Level: +69.20mOD		Report No: 10767/JW	
Progress & Observations	Samples & Tests		Field Test Results	Strata		Legend	Strata Descriptions	Backfill / Installation
	Type	Depth (m)		Depth (m)	Level (m)			
BH commenced: 23 August 2022 BH dia: 125mm	D	0.25	0.0	0.20	69.00		Grass over dark brown TOPSOIL	
Hand excavated inspection pit to 1.20m	PID	0.25		1.00	68.20		MADE GROUND: brown/orangish brown slightly clayey sandy gravel of flint and rare brick fragments	
	D	0.50						
	PID	0.50						
	D	0.75						
	PID	0.75						
	D	1.00						
	PID	1.00	0.0					
	D	1.20	0.0					
	SPT/S	1.20	N=6					
	PID	1.20	0.0					
Triaxial result = 304kPa	D	1.85	N=15	2.75	66.45		Soft, becoming firm to very stiff, light brown/reddish brown/ greyish brown mottled slightly sandy slightly gravelly silty CLAY with occasional fine roots. Gravel is subangular to subrounded fine to medium flint gravel	
	U	2.00						
	D	2.75					N=23	
D	3.00							
SPT/S	3.00							
D	3.75	N=35	4.75	64.45		Stiff dark reddish brown, mottled greyish blue, silty CLAY		
D	4.00							
SPT/S	4.00							
D	4.75	N=50*	6.00	63.20		Dense light grey clayey silty fine to medium SAND		
D	5.00							
SPT/S	5.00							
D	6.00	N>50*	9.00	60.20		Very dense greyish green slightly silty very sandy GRAVEL. Gravel is rounded fine to coarse flint		
D	6.50							
SPT/S	6.50							
D	7.50	N>50*	10.00	59.20		CHALK - recovered as off white weak chalk gravel in a matrix of silt sized communitated material. Rare gravel sized flint fragments		
D	8.00							
SPT/C	8.00							
D	9.00	N=13						
D	9.50							
SPT/S	9.50							
Continued on next sheet								10
Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone PP = Pocket Penetrometer [kg/cm²] HV = Hand Vane [kPa] PID = Photo Ionisation Detector [ppm - Isobutylene Equivalent, PhoCheck Tiger, 10.6eV lamp] * = full SPT penetration not achieved - see summary sheet								Borehole type: Rotary Auger
Remarks: a) approximate ground level from Midland Survey Ltd Utility and CCTV Drainage Survey (Ref: 41975_1, dated July 2022) and coordinates from online mapping data b) 50mm ID standpipe installed to 5.0m								Borehole No: BH01

Site & Location: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB								Borehole No: BH01	
Client: Denville Hall 2012 Ltd						Coordinates: 508145E, 191330N		Sheet 2 of 2	
Engineer: London Structures Lab						Ground Level: +69.20mOD		Report No: 10767/JW	
Progress & Observations	Samples & Tests		Field Test Results	Strata		Legend	Strata Descriptions	Backfill / Installation	
	Type	Depth (m)		Depth (m)	Level (m)				
BH completed: 23 August 2022 BH depth: 18.0m Groundwater depth: BH dry	D	10.50	N=22	18.00	51.20		CHALK - recovered as off white weak chalk gravel in a matrix of silt sized communitied material. Rare gravel sized flint fragments		
	D SPT/S	11.00 11.00							
	D	12.00							
	D SPT/S	12.50 12.50	N=29						
	D	13.50							
	D SPT/S	14.00 14.00							
	D	15.00	N=56						
	D SPT/S	15.50 15.50							
	D	16.75							
	D SPT/S	17.55 17.55	N=43						
	D								
	D SPT/S								
End of hole at 18.00m									
Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone PP = Pocket Penetrometer [kg/cm²] HV = Hand Vane [kPa] PID = Photo Ionisation Detector [ppm - Isobutylene Equivalent, PhoCheck Tiger, 10.6eV lamp] * = full SPT penetration not achieved - see summary sheet								Borehole type: Rotary Auger	
Remarks: a) approximate ground level from Midland Survey Ltd Utility and CCTV Drainage Survey (Ref: 41975_1, dated July 2022) and coordinates from online mapping data b) 50mm ID standpipe installed to 5.0m								Borehole No: BH01	

Site & Location: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB							Borehole No: BH02	
Client: Denville Hall 2012 Ltd					Coordinates: 508114E, 191400N		Sheet 1 of 2	
Engineer: London Structures Lab					Ground Level: +71.90mOD		Report No: 10767/JW	
Progress & Observations	Samples & Tests		Field Test Results	Strata		Legend	Strata Descriptions	Backfill / Installation
	Type	Depth (m)		Depth (m)	Level (m)			
BH commenced: 24 August 2022 BH dia: 125mm	D	0.25	0.0	0.20	71.70		Grass over dark brown TOPSOIL	
	PID	0.25		0.75	71.15			
PID	0.50	0.1						MADE GROUND: dark brown/orangish brown mottled slightly sandy slightly gravelly silty clay. Gravel is fine to coarse flint and charcoal fragments
PID	0.75							
Hand excavated inspection pit to 1.20m	PID	0.75	N=4 N60=6 0.0			2.00	69.90	
	D	1.20		N=17 N60=24 0.0	2.75			
	SPT/C	1.20	N=24 N60=33 0.0			3.00	68.90	
	PID	1.20		N>50*	8.00			
	D	1.85	N>50*				Very dense brown/greenish brown silty gravelly SAND. Gravel is rounded fine to coarse flint	
	PID	1.85		N=60 N60=83				
	D	2.00	N>50*					
	SPT/S	2.00		N>50*				
	PID	2.00	N>50*					
	D	2.75		N>50*				
	PID	2.75	N>50*					
	D	3.00		N>50*				
	SPT/S	3.00	N>50*					
	PID	3.00		N>50*				
	D	3.75	N>50*					
	SPT/S	4.00		N>50*				
D	4.75	N>50*						
PID	5.00			N>50*				
SPT/S	5.00	N>50*						
D	6.00			N>50*				
PID	6.50	N>50*						
SPT/S	6.50			N>50*				
D	7.50	N>50*						
PID	8.00			N>50*				
SPT/S	8.00	N>50*						
D	9.00			N>50*				
PID	9.50	N>50*						
SPT/S	9.50			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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PID	10.00			N>50*				
SPT/S	10.00	N>50*						
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PID	10.00	N>50*						
SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
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SPT/S	10.00	N>50*						
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SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*				
D	10.00	N>50*						
PID	10.00			N>50*				
SPT/S	10.00	N>50*						
D	10.00			N>50*				
PID	10.00	N>50*						
SPT/S	10.00			N>50*</				

Site & Location: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB							Borehole No: BH02		
Client: Denville Hall 2012 Ltd					Coordinates: 508114E, 191400N		Sheet 2 of 2		
Engineer: London Structures Lab					Ground Level: +71.90mOD		Report No: 10767/JW		
Progress & Observations	Samples & Tests		Field Test Results	Strata		Legend	Strata Descriptions	Backfill / Installation	
	Type	Depth (m)		Depth (m)	Level (m)				
BH completed: 24 August 2022 BH depth: 18.0m Groundwater depth: BH dry	D	10.50	N=43 N ₆₀ =59	10.50	61.40		Very dense brown/greenish brown silty gravelly SAND. Gravel is rounded fine to coarse flint		
	D SPT/S	11.00 11.00					CHALK - recovered as off white weak chalk gravel in a matrix of silt sized communitated material. Rare gravel sized flint fragments		
	D	12.00							
	D SPT/S	12.50 12.50	N=37 N ₆₀ =51						
	D	13.50							
	D SPT/S	14.00 14.00		N=36 N ₆₀ =50					
	D	15.00							
	D SPT/S	15.50 15.50	N=47 N ₆₀ =65						
	D	16.75							
	D SPT/S	17.55 17.55		N>50*					
				18.00	53.90		End of hole at 18.00m		
								11	
								12	
								13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	
Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone PP = Pocket Penetrometer [kg/cm²] HV = Hand Vane [kPa] PID = Photo Ionisation Detector [ppm - Isobutylene Equivalent, PhoCheck Tiger, 10.6eV lamp] * = full SPT penetration not achieved - see summary sheet								Borehole type: Rotary Auger	
Remarks: a) approximate ground level from Midland Survey Ltd Utility and CCTV Drainage Survey (Ref: 41975_1, dated July 2022) and coordinates from online mapping data b) 50mm ID standpipe installed to 5.0m								Borehole No: BH02	

Site & Location: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB							Borehole No: BH03		
Client: Denville Hall 2012 Ltd					Coordinates: 508115E, 191395N		Sheet 1 of 1		
Engineer: London Structures Lab					Ground Level: +71.90mOD		Report No: 10767/JW		
Progress & Observations	Samples & Tests		Field Test Results	Strata		Legend	Strata Descriptions	Backfill / Installation	
	Type	Depth (m)		Depth (m)	Level (m)				
BH commenced: 23 August 2022 BH dia: 125mm	D PID	0.25 0.25	0.0	0.50	71.40		MADE GROUND: dark brown silty very gravelly sand. Gravel is fine to coarse flint, brick and clinker. Occasional concrete cobbles		1
Hand excavated inspection pit to 1.20m	D PID	0.50 0.50	0.0				MADE GROUND: dark brown slightly sandy slightly gravelly clay. Gravel is fine to coarse flint, brick, clinker and occasional chalk		
	D PID	0.75 0.75	0.0						
	D PID	1.00 1.00	0.0						
	Groundwater strike at 1.50m	D PID	1.50 1.50	0.0					
D PID		2.00 2.00	0.0	2.00	69.90		MADE GROUND: dark brown and dark grey mottled gravelly clay. Gravel is fine to coarse chalk, brick and flint. Slight organic odour	2	
	D PID	2.50 2.50	0.0						
BH completed: 23 August 2022 BH depth: 3.0m Groundwater depth: 1.50m	D PID	3.00 3.00	0.0	2.90	69.00		Light brown and orangish brown mottled clayey silty SAND. Occasional pockets of soft dark grey clay		3
					3.00		68.90		
									4
									5
Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone PP = Pocket Penetrometer [kg/cm²] HV = Hand Vane [kPa] PID = Photo Ionisation Detector [ppm - Isobutylene Equivalent, PhoCheck Tiger, 10.6eV lamp] * = full SPT penetration not achieved - see summary sheet								Borehole type: Rotary Auger	
Remarks: a) approximate ground level from Midland Survey Ltd Utility and CCTV Drainage Survey (Ref: 41975_1, dated July 2022) and coordinates from online mapping data b) BH backfilled on completion								Borehole No: BH03	



FOREWORD FOR DYNAMIC SAMPLER BOREHOLES (WINDOWLESS) - GUIDANCE NOTES

GENERAL

The borehole records are compiled from the driller's description of the strata encountered, an examination of the samples by our geotechnical engineer and the results of in-situ and laboratory tests. Based on these data, the report presents an opinion on the configuration of strata within the site. However, such reasonable assumptions are given for guidance only and no liability can be accepted for changes in conditions not revealed by the boreholes.

BORING METHODS

The dynamic sampler technique uses 1m long tubes containing a rigid plastic liner. These are driven into the ground by a falling hammer, then withdrawn and the liner removed. The borehole commences using a large diameter tube (usually 100mm) with each succeeding tube reducing usually by 10mm in diameter to assist the extraction of the tube from the ground. Thus, it is theoretically possible to obtain a total continuous sample of the soil for examination or testing. Casing can be utilised as required. The technique allows the ground conditions to be reasonably well established although disturbance of the ground is inevitable, particularly some "softening" of the upper zone of clay immediately beneath a granular soil. The presence of thin layers of different soils within a stratum may not always be detected.

GROUND WATER

The depth at which ground water was struck is entered on the borehole records. However, this observation may not indicate the true water level at that time. Due to the speed of boring and the relatively small diameter of the borehole, natural ground water may be present at a depth higher than the water strike. Moreover, ground water levels are subject to variations caused by changes in the local drainage conditions and by seasonal effects. When a moderate inflow of water does take place, boring is suspended for at least 10 minutes to enable a more accurate short-term water level to be achieved. An estimate of the rate of inflow is also given. This is a relative term and serves only as a guide to the probable flow of water into an excavation.

Further observations of the water level made during the progress of the borehole are shown including end of shift and overnight readings and the depth at which water was sealed off by the borehole casing, if applicable.

SAMPLES

Small disturbed samples can be recovered from the lining tubes for subsequent laboratory testing, including moisture content, index property tests and contamination analyses.

IN-SITU TESTING

Standard Penetration Test (SPT): this test is performed in accordance with the procedure given in BS EN ISO 22476-3:2005. The individual blow count record for each test is given on a separate table. The 'N' value is normally the number of blows to achieve a penetration of 0.3m following a seating distance of 0.15m and is quoted at the mid-depth of the test zone. However if a change of stratum occurs within the test zone then a revised 'N' value can be calculated to assess one layer in particular. In hard strata full penetration may not be obtained. The presence of groundwater and particularly Where groundwater can affect the test and the measured values may not represent the true in-situ density of the soil.

Hand Shear Vane: provides the shear strength of cohesive soils, values reported in kPa

Pocket Penetrometer: provides an estimate of the unconfined compression strength, values reported in kg/cm²

Site & Location	Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No:	10767/JW
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STANDARD PENETRATION TEST SUMMARY

BH	Depth	Test	N value	Blow-counts and penetration						Casing	Water	Remarks
ID	(m)	type	(Note b)	Seating blows		Test blows				depth (m)	depth (m)	
BH01	1.20	S	N=6	1	1	1	1	2	2	0.00	BH dry	
BH01	3.00	S	N=15	2	3	3	3	4	5	0.00	BH dry	
BH01	4.00	S	N=23	3	4	5	5	6	7	0.00	BH dry	
BH01	5.00	S	N=35	5	8	8	8	9	10	0.00	BH dry	
BH01	6.50	S	(56)	10	9	12	20	24		0.00	BH dry	
BH01	8.00	C	(88)	17	23	38	50/20mm			0.00	BH dry	
BH01	9.50	S	N=13	1	2	3	3	3	4	0.00	BH dry	
BH01	11.00	S	N=22	3	4	5	6	5	6	0.00	BH dry	
BH01	12.50	S	N=29	4	5	6	6	8	9	0.00	BH dry	
BH01	14.00	S	N=56	6	8	12	20	12	12	0.00	BH dry	
BH01	15.50	S	N=43	6	8	9	10	10	14	0.00	BH dry	
BH01	17.55	S	N=35	4	6	8	8	6	13	0.00	BH dry	
BH02	1.20	C	N=4	1	1	1	1	1	1	0.00	BH dry	
BH02	2.00	S	N=17	2	3	3	4	5	5	0.00	BH dry	
BH02	3.00	S	N=24	4	5	5	6	6	7	0.00	BH dry	
BH02	4.00	S	(59)	8	10	21	38			0.00	BH dry	
BH02	5.00	S	(54)	9	10	12	19	23		0.00	BH dry	
BH02	6.50	S	N=60	8	10	14	14	15	17	0.00	BH dry	
BH02	8.00	S	(58)	6	9	12	17	29		0.00	BH dry	
BH02	9.50	S	(50)	12	31	50/50mm				0.00	BH dry	
BH02	11.00	S	N=43	6	6	9	10	12	12	0.00	BH dry	
BH02	12.50	S	N=37	7	8	8	8	10	11	0.00	BH dry	
BH02	14.00	S	N=36	5	6	6	8	10	12	0.00	BH dry	
BH02	15.50	S	N=47	6	9	10	12	12	13	0.00	BH dry	
BH02	17.55	S	(50)	50/30mm		50/30mm				0.00	BH dry	
WS01	1.00	S	N=17	4	4	4	4	4	5	0.00	BH dry	
WS01	2.00	S	N=23	5	6	6	6	5	6	0.00	BH dry	
WS01	3.00	S	N=24	5	6	6	6	6	6	0.00	BH dry	
WS01	4.00	S	N=22	6	5	5	6	5	6	0.00	BH dry	
WS02	1.00	S	N=9	1	2	2	2	3	2	0.00	BH dry	
WS02	2.00	S	N=11	2	2	2	2	3	4	0.00	BH dry	
WS02	3.00	S	N=15	3	3	4	3	4	4	0.00	BH dry	
WS02	4.00	S	N=33	4	6	6	8	9	10	0.00	BH dry	
WS02	5.00	S	N=42	9	11	10	10	11	11	0.00	BH dry	
WS03	1.00	S	N=10	2	2	2	2	3	3	0.00	BH dry	
WS03	2.00	S	N=13	2	2	3	3	3	4	0.00	BH dry	
WS03	3.00	S	N=21	3	4	5	5	5	6	0.00	BH dry	
WS03	4.00	S	N=37	4	5	6	8	11	12	0.00	BH dry	

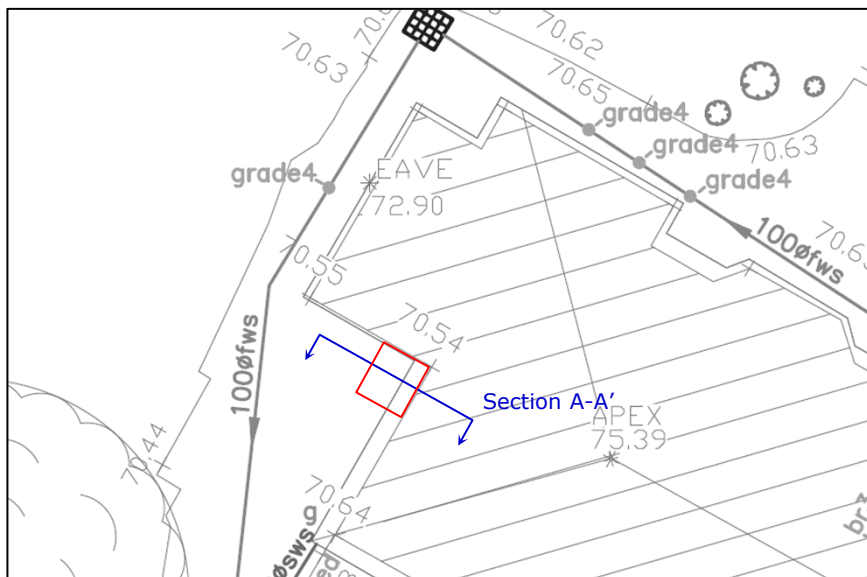
a) Standard Penetration Test : BS EN ISO 22476:2005 Part 3

b) Where full penetration was not achieved, the total test blow-counts are reported

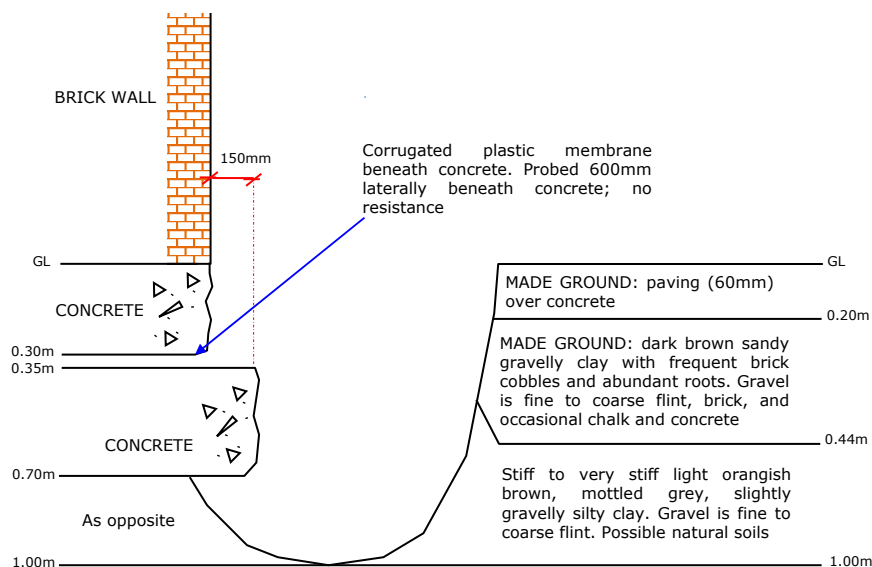
c) Hammer Energy Ratio, Er = 83% (BH01 and BH02) and 81% (WS01 to WS03)

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Trial Pit No: TP01 (1 of 3)
Client:	Denville Hall 2012 Ltd	Report No:
Engineer:	London Structures Lab	10767/JW

PLAN



SECTION A-A' (looking SW)

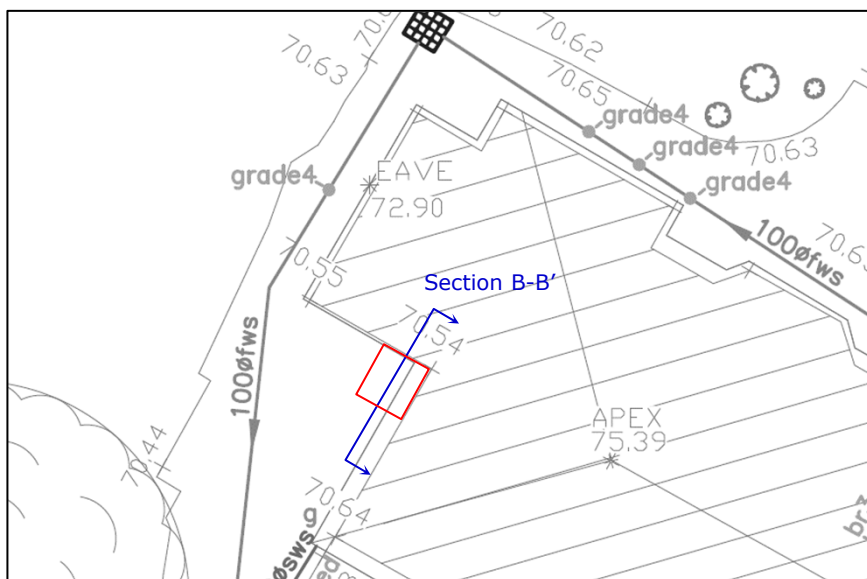


D = small disturbed sample, E = environmental sample (glass jar and tub), HV = hand shear vane test (kPa), pp = pocket penetrometer (kg/cm²)

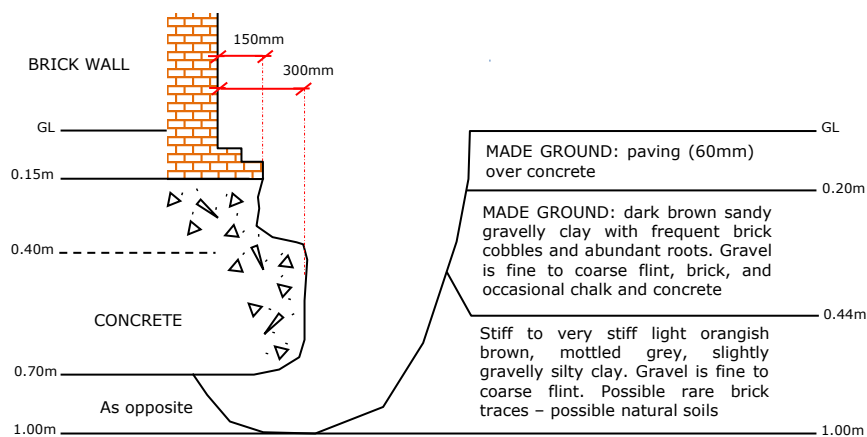
Date:	22/08/22	Groundwater details	Samples
Equipment:	Hand excavated	• Dry	D @ 1.00m
Stability:	Stable		
Remarks:	Pit inspected by engineer		Logged by: JW

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Trial Pit No: TP01 (2 of 3)
Client:	Denville Hall 2012 Ltd	Report No:
Engineer:	London Structures Lab	10767/JW

PLAN



SECTION B-B' (looking SE)



D = small disturbed sample, E = environmental sample (glass jar and tub), HV = hand shear vane test (kPa), pp = pocket penetrometer (kg/cm²)

Date:	22/08/22	Groundwater details Dry	Samples D @ 1.00m
Equipment:	Hand excavated		
Stability:	Stable		
Remarks:	Pit inspected by engineer		Logged by: JW

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Trial Pit No: TP01 (3 of 3)
Client:	Denville Hall 2012 Ltd	Report No:
Engineer:	London Structures Lab	10767/JW

PHOTOGRAPHS

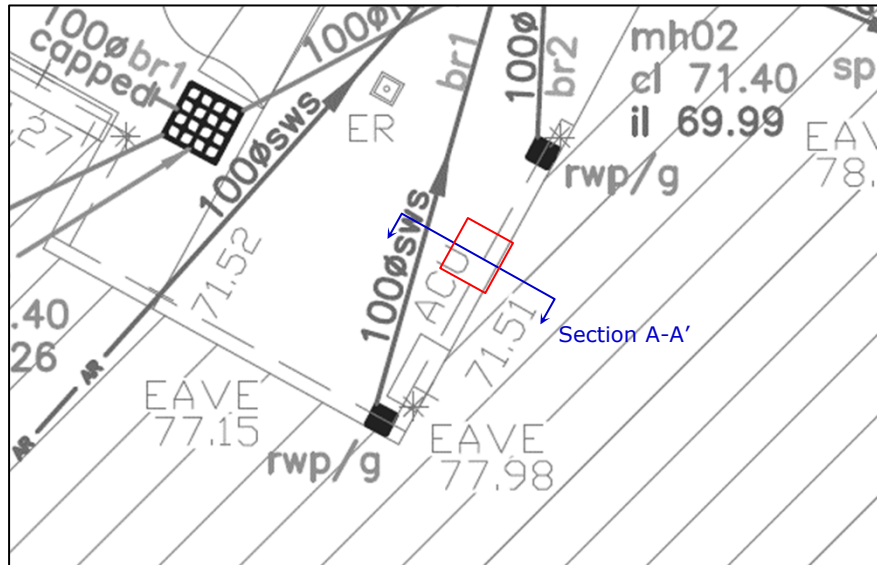


D = small disturbed sample, E = environmental sample (glass jar and tub), HV = hand shear vane test (kPa), pp = pocket penetrometer (kg/cm²)

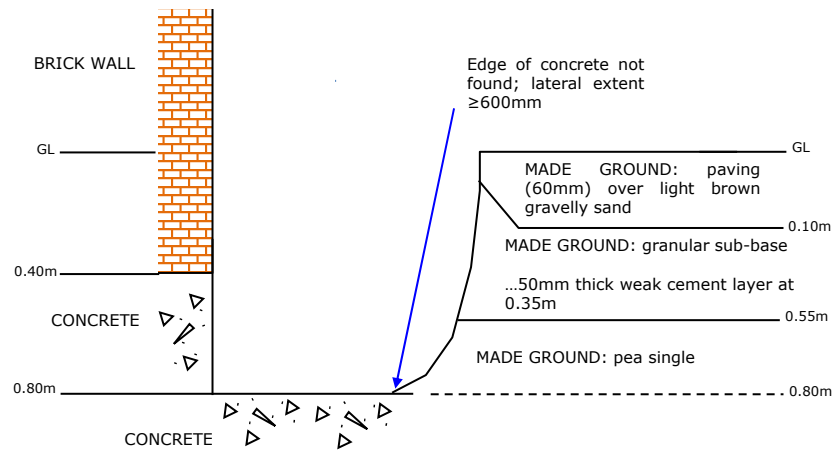
Date:	22/08/22	Groundwater details	Samples
Equipment:	Hand excavated	• Dry	D @ 1.00m
Stability:	Stable		
Remarks:			Logged by: JW

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Trial Pit No: TP02 (1 of 2)
Client:	Denville Hall 2012 Ltd	Report No:
Engineer:	London Structures Lab	10767/JW

PLAN



SECTION A-A' (looking SW)



D = small disturbed sample, E = environmental sample (glass jar and tub), HV = hand shear vane test (kPa), pp = pocket penetrometer (kg/cm²)

Date:	22/08/22	Groundwater details	Samples
Equipment:	Hand excavated	• Dry	
Stability:	Stable		
Remarks:	Pile cage spacer found within made ground. Pit inspected by engineer		Logged by: JW

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Trial Pit No: TP02 (2 of 2)
Client:	Denville Hall 2012 Ltd	Report No:
Engineer:	London Structures Lab	10767/JW

PHOTOGRAPHS

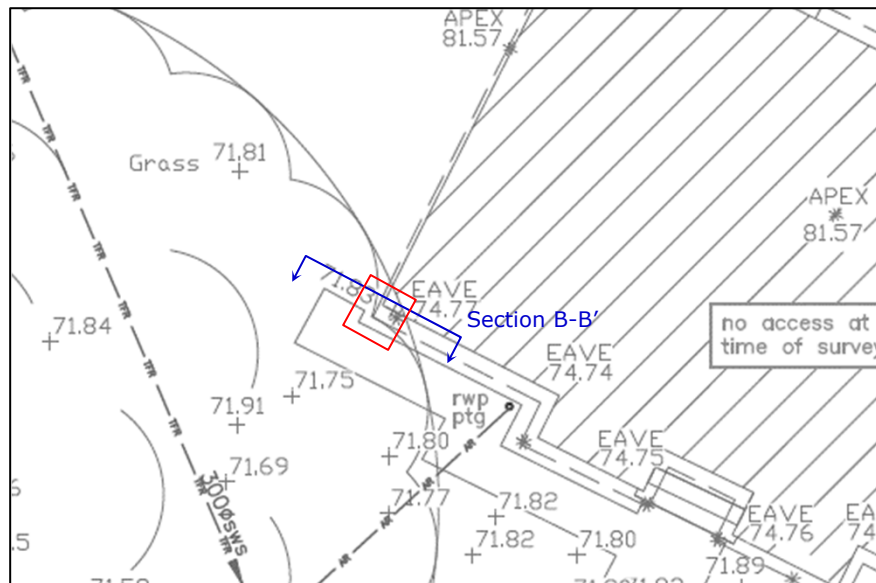


D = small disturbed sample, E = environmental sample (glass jar and tub), HV = hand shear vane test (kPa), pp = pocket penetrometer (kg/cm²)

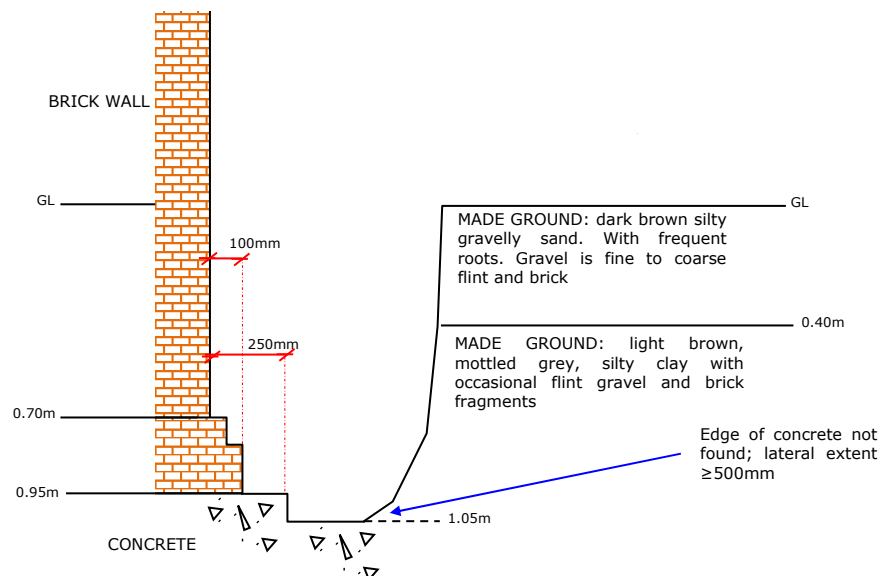
Date:	22/08/22	Groundwater details	Samples
Equipment:	Hand excavated	• Dry	D @ 1.00m
Stability:	Stable		
Remarks:			Logged by: JW

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Trial Pit No: TP03 (2 of 3)
Client:	Denville Hall 2012 Ltd	Report No:
Engineer:	London Structures Lab	10767/JW

PLAN



SECTION B-B' (looking SW)

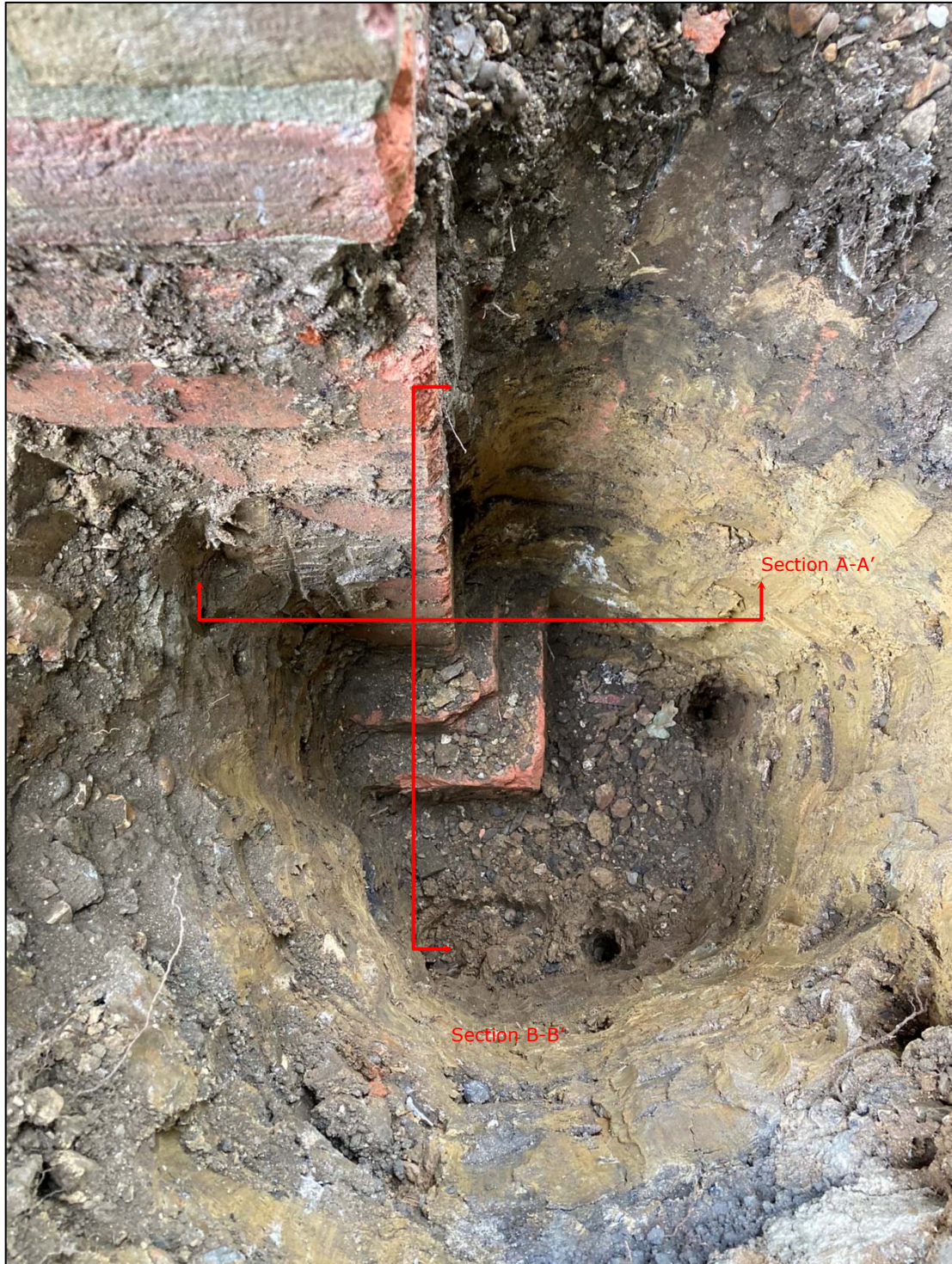


D = small disturbed sample, E = environmental sample (glass jar and tub), HV = hand shear vane test (kPa), pp = pocket penetrometer (kg/cm²)

Date:	22/08/22	Groundwater details	Samples
Equipment:	Hand excavated	• Dry	D @ 1.00m
Stability:	Stable		
Remarks:	Pit inspected by engineer		Logged by: JW

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Trial Pit No: TP03 (3 of 3)
Client:	Denville Hall 2012 Ltd	Report No:
Engineer:	London Structures Lab	10767/JW

PHOTOGRAPHS



D = small disturbed sample, E = environmental sample (glass jar and tub), HV = hand shear vane test (kPa), pp = pocket penetrometer (kg/cm²)

Date:	22/08/22	Groundwater details	Samples
Equipment:	Hand excavated	• Dry	D @ 1.00m
Stability:	Stable		
Remarks:			Logged by: JW

Site & Location Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB					Report 10767/JW No:
SUMMARY OF ENVIRONMENTAL TRIAL PIT SAMPLES AND PID READINGS					
Sample ID	Depth (m)	Description	Sample type	PID result (ppm)	Remarks
S1	0.20	MADE GROUND: dark brown friable slightly gravelly slightly sandy sity clay. Gravel is fine to coarse flint and concrete, breeze block, brick and tile fragments. Occasional roots	ES	0.0	508095E, 191369N
S2	0.20	MADE GROUND: dark brown/brown/orangish brown slightly gravelly clay. Gravel is fine to coarse flint and occasional brick. Occasional roots	ES	0.0	
S3	0.20	MADE GROUND: dark brown silty sandy gravel. Gravel is fine to medium flint. Occasional roots	ES	0.0	
S4	0.20	Dark bown slightly gravelly TOPSOIL. Gravel is fine to coarse flint and mortar fragments. Frequent roots	ES	0.0	
S5	0.20	Dark bown slightly gravelly TOPSOIL. Gravel is fine to coarse flint. Frequent roots	ES	0.0	
S101	0.20	MADE GROUND: light brown slightly sandy slightly gravelly clay. Gravel is fine to coarse flint, chalk with brick and clinker fragments. Occasional roots	ES	0.00	
S101	0.50	MADE GROUND: light brown slightly sandy slightly gravelly clay. Gravel is fine to coarse flint, chalk with brick and clinker fragments. Occasional roots	ES	0.00	
S102	0.20	MADE GROUND: brown slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick and clinker. Occasional roots	ES	0.00	
S102	0.50	MADE GROUND: brown slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick and clinker. Occasional roots	ES	0.00	
S103	0.20	MADE GROUND: dark brown and light brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick, clinker and ocncrete fragments.	ES	0.10	
S103	0.50	MADE GROUND: dark brown and light brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick, clinker and ocncrete fragments.	ES	0.10	
S104	0.20	MADE GROUND: dark brown and brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and occasioal chalk with brick, concrete and occasional clinker fragments.	ES	0.10	
S104	0.50	MADE GROUND: light brown, speckled black, silty clay. Occasional roots.	ES	0.00	
S105	0.20	MADE GROUND: light and dark brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick and occasional clinker fragments. Frequent roots.	ES	0.00	
					Date: 03.06.2026

Site & Location Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB					Report No: 10767/JW
SUMMARY OF ENVIRONMENTAL TRIAL PIT SAMPLES AND PID READINGS					
Sample ID	Depth (m)	Description	Sample type	PID result (ppm)	Remarks
S105	0.50	MADE GROUND: light and dark brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick and occasional clinker fragments. Frequent roots.	ES	0.10	
S106	0.20	MADE GROUND: light and dark brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick and occasional clinker fragments. Low brick cobble content.	ES	0.00	
S106	0.50	MADE GROUND: light brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick and occasional clinker fragments. Low brick cobble content.	ES	0.00	
S107	0.20	MADE GROUND: dark and light brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint and chalk with brick and occasional clinker fragments.	ES	0.00	
S107	0.50	MADE GROUND: light brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse chalk with occasional brick fragments.	ES	0.00	
S108	0.20	MADE GROUND: dark and light brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint, chalk with brick and occasional clinker fragments.	ES	0.00	
S108	0.50	MADE GROUND: light brown slightly gravelly clay. Gravel is fine to coarse chalk	ES	0.00	
S109	0.20	MADE GROUND: dark brown very clayey very gravelly sand. Gravel is fine to coarse flint with brick and clinker fragments.	ES	0.00	
S109	0.50	MADE GROUND: dark brown very clayey very gravelly sand. Gravel is fine to coarse flint and chalk with brick and clinker fragments.	ES	0.10	
S110	0.20	MADE GROUND: light and dark brown mottled slightly sandy slightly gravelly clay. Gravel is fine to medium flint with brick fragments. Occasional ashy pockets.	ES	0.10	
S110	0.50	MADE GROUND: brown slightly gravelly sandy clay/very clayey sand. Gravel is fine to medium flint with clinker fragments. Occasional ashy pockets.	ES	0.00	
S111	0.20	MADE GROUND: dark brown and grey mottled clayey sandy gravel. Gravel is fine to medium flint with limestone fragments. Occasional roots and ashy pockets.	ES	0.00	
S111	0.50	MADE GROUND: dark and light brown mottled slightly sandy slightly gravelly clay. Gravel is fine to coarse flint with brick and clinker fragments. Occasional ashy pockets.	ES	0.00	
S112	0.20	MADE GROUND: dark brown slightly slightly gravelly clay. Gravel is fine to coarse flint and chalk. Low brick cobble content.	ES	0.00	
					Date: 03.06.2026

Site & Location	Denville Hall, 62 Duck's Hill Road, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater /gas monitoring

Date:	29/09/2022	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	995	Next calibration date:	Sep 2022
c) At end (mB):	997	Notes:	
Recorded by:	JW	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Surface ground conditions:	Dry	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Weather conditions:	Clear	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide;
Ambient air temp (°C):	12		O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS01	10:07:27	35	DRY	4.00

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.2	21.4	0	0	0.1
15	0.0	1.0	20.9	0	0	0.2
30	0.0	1.1	20.7	0	0	1.1
45	0.0	1.4	20.5	0	0	1.9
60	0.0	1.7	20.2	0	0	2.5
75	0.0	2.1	20.0	0	0	3.7
90	0.0	2.4	19.7	0	0	4.5
105	0.0	2.7	19.5	0	0	5.0
120	0.0	2.9	19.3	0	0	5.0
135	0.0	3.1	19.2	0	0	5.0
150	0.0	3.1	19.2	0	0	4.9
165	0.0	3.1	19.2	0	0	4.8
180	0.0	3.0	19.2	0	0	4.5
300	0.0	2.9	19.3	0	0	4.5

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.1
Min O ₂ (%)	19.2
Max CO (ppm)	0
Max H ₂ S (ppm)	0
Max PID (ppm)	5.0

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.1	0.2	0.2	0.03

Site & Location	Denville Hall, 62 Duck's Hill Road, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater /gas monitoring

Date:	29/09/2022	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	995	Next calibration date:	Sep 2022
c) At end (mB):	997	Notes:	
Recorded by:	JW	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Surface ground conditions:	Dry	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Weather conditions:	Clear	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide;
Ambient air temp (°C):	11		O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS02	09:40:33	35	DRY	5.12

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.3	21.2	0	0	0.1
15	0.0	3.7	20.2	0	0	0.1
30	0.0	3.7	19.2	0	0	0.1
45	0.0	3.5	19.3	0	0	0.0
60	0.0	3.3	19.4	0	0	0.0
75	0.0	2.9	19.7	0	0	0.0
90	0.0	2.5	20.0	0	0	0.0
105	0.0	2.1	20.3	0	0	0.0
120	0.0	1.8	20.5	0	0	0.0
135	0.0	1.7	20.6	0	0	0.0
150	0.0	1.6	20.7	0	0	0.0
165	0.0	1.6	20.7	0	0	0.0
180	0.0	1.6	20.7	0	0	0.0
300	0.0	1.6	20.7	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.7
Min O ₂ (%)	19.2
Max CO (ppm)	0
Max H ₂ S (ppm)	0
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.1	0.1	0.1	-0.54

Site & Location	Denville Hall, 62 Duck's Hill Road, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater /gas monitoring

Date:	29/09/2022	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	995	Next calibration date:	Sep 2022
c) At end (mB):	997	Notes:	
Recorded by:	JW	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Surface ground conditions:	Dry	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Weather conditions:	Clear	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide;
Ambient air temp (°C):	9		O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH01	09:22:15	50	DRY	5.00

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.2	21.6	0	0	0.1
15	0.0	4.9	20.3	0	0	0.2
30	0.0	4.9	18.5	0	0	0.1
45	0.0	5.0	18.3	0	0	0.1
60	0.0	5.0	18.2	0	0	0.0
75	0.0	5.0	18.2	0	0	0.0
90	0.0	5.0	18.2	0	0	0.0
105	0.0	5.0	18.2	0	0	0.0
120	0.0	5.0	18.2	0	0	0.0
135	0.0	5.0	18.1	0	0	0.0
150	0.0	5.0	18.1	0	0	0.0
165	0.0	5.0	18.1	0	0	0.0
180	0.0	5.0	18.1	0	0	0.0
300	0.0	4.8	18.2	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	5.0
Min O ₂ (%)	18.1
Max CO (ppm)	0
Max H ₂ S (ppm)	0
Max PID (ppm)	0.2

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	-0.36

Site & Location	Denville Hall, 62 Duck's Hill Road, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater /gas monitoring

Date:	29/09/2022	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	995	Next calibration date:	Sep 2022
c) At end (mB):	997	Notes:	
Recorded by:	JW	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Surface ground conditions:	Dry	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Weather conditions:	Clear	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide;
Ambient air temp (°C):	11		O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH02	09:53:45	50	DRY	4.65

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.2	21.3	0	0	0.1
15	0.0	2.1	20.6	0	0	0.2
30	0.0	2.5	19.7	0	0	0.2
45	0.0	3.2	19.1	0	0	0.0
60	0.0	3.6	18.6	0	0	0.0
75	0.0	3.8	18.4	0	0	0.0
90	0.0	4.0	18.3	0	0	0.0
105	0.0	4.0	18.3	0	0	0.0
120	0.0	4.1	18.3	0	0	0.0
135	0.0	4.1	18.3	0	0	0.0
150	0.0	4.1	18.3	0	0	0.0
165	0.0	4.1	18.3	0	0	0.0
180	0.0	4.1	18.3	0	0	0.0
300	0.0	4.0	18.4	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	4.1
Min O ₂ (%)	18.3
Max CO (ppm)	0
Max H ₂ S (ppm)	0
Max PID (ppm)	0.2

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	-0.1	0.0	-0.40

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	06/05/2026	Monitoring equipment	
Barometric pressure:	Falling 1006	Instrument:	GA5000. No. G505055
a) Trend (24hrs):		Calibration check details:	See note 2 below
b) At start (mB):		Next calibration date:	June 2026
Recorded by:	DP	Notes: 1) Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit 2) Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture 3) CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide	
Surface ground conditions:	Dry Cloudy 16		
Weather conditions:			
Ambient air temp (°C):			

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS01	16:29:00	35	Dry	3.89

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.3	21.2	0	1	0.1
15	0.0	4.8	18.1	0	1	0.1
30	0.0	4.9	16.4	0	1	0.1
45	0.0	4.9	16.2	0	1	0.1
60	0.0	5.0	16.2	0	1	0.1
75	0.0	5.0	16.2	0	1	0.1
90	0.0	5.0	16.2	0	1	0.1
105	0.0	5.0	16.1	0	1	0.1
120	0.0	5.0	16.1	0	1	0.1
135	0.0	5.0	16.2	0	1	0.1
150	0.0	4.8	16.3	0	1	0.1
165	0.0	4.7	16.6	0	1	0.1
180	0.0	4.5	16.8	0	1	0.1
195	0.0	4.3	17.3	0	1	0.1

Max CH ₄ (%)	0.0
Max CO ₂ (%)	5.0
Min O ₂ (%)	16.1
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	36.91

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	06/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Falling	Calibration check details:	See note 2 below
b) At start (mB):	1006	Next calibration date:	June 2026
Recorded by:	DP	Notes:	
Surface ground conditions:	Dry	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	16	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS02	15:43:00	35	Dry	4.07

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.9	0	1	0.1
15	0.0	0.7	20.8	0	1	0.1
30	0.0	0.9	20.1	0	1	0.1
45	0.0	1.1	19.7	0	1	0.1
60	0.0	1.2	19.7	0	1	0.1
75	0.0	1.2	19.6	0	1	0.1
90	0.0	1.2	19.6	0	1	0.1
105	0.0	1.2	19.6	0	1	0.1
120	0.0	1.2	19.6	0	1	0.1
135	0.0	1.2	19.7	0	1	0.1
150	0.0	1.1	19.7	0	1	0.1
165	0.0	1.1	19.7	0	1	0.1
180	0.0	1.1	19.7	0	1	0.1
195	0.0	1.1	19.7	0	1	0.1

Max CH ₄ (%)	0.0
Max CO ₂ (%)	1.2
Min O ₂ (%)	19.6
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
-0.1	-0.1	0.0	35.84

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	06/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Falling	Calibration check details:	See note 2 below
b) At start (mB):	1006	Next calibration date:	June 2026
Recorded by:	DP	Notes:	
Surface ground conditions:	Dry	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	16	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH01	16:17:00	50	Dry	4.93

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	21.3	0	1	0.0
15	0.0	3.2	19.8	0	1	0.0
30	0.0	3.5	18.7	0	1	0.0
45	0.0	3.9	18.3	0	1	0.0
60	0.0	4.1	18.1	0	1	0.0
75	0.0	4.2	18.0	0	1	0.1
90	0.0	4.3	17.9	0	1	0.1
105	0.0	4.3	17.9	0	1	0.1
120	0.0	4.3	17.9	0	1	0.0
135	0.0	4.3	17.9	0	1	0.0
150	0.0	4.3	17.9	0	1	0.0
165	0.0	4.3	17.9	0	1	0.0
180	0.0	4.4	17.9	0	1	0.0
195	0.0	4.2	17.9	0	1	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	4.4
Min O ₂ (%)	17.9
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
-0.2	-0.2	-0.1	35.78

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	06/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Falling	Calibration check details:	See note 2 below
b) At start (mB):	1006	Next calibration date:	June 2026
Recorded by:	DP	Notes:	
Surface ground conditions:	Dry	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	16	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH02	15:58:00	50	Dry	4.51

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.8	0	1	0.0
15	0.0	0.3	21.0	0	1	0.0
30	0.0	0.4	20.8	0	1	0.0
45	0.0	0.4	20.7	0	1	0.0
60	0.0	0.4	20.7	0	1	0.0
75	0.0	0.4	20.7	0	1	0.0
90	0.0	0.5	20.7	0	1	0.0
105	0.0	0.5	20.7	0	1	0.0
120	0.0	0.5	20.6	0	1	0.0
135	0.0	0.5	20.6	0	1	0.0
150	0.0	0.5	20.6	0	1	0.0
165	0.0	0.5	20.6	0	1	0.0
180	0.0	0.5	20.6	0	1	0.0
195	0.0	0.5	20.6	0	1	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	0.5
Min O ₂ (%)	20.6
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	0.0

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	-0.1	0.0	35.77

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	14/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Falling	Calibration check details:	See note 2 below
b) At start (mB):	996	Next calibration date:	June 2026
Recorded by:	DP	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	12	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS01	13:11:00	35	Dry	2.91

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.2	21.2	0	0	0.1
15	0.0	5.3	18.5	0	0	0.1
30	0.0	5.4	16.3	1	0	0.1
45	0.0	5.4	16.2	0	0	0.1
60	0.0	5.4	16.1	0	0	0.1
75	0.0	5.4	16.1	0	0	0.1
90	0.0	5.4	16.1	0	0	0.1
105	0.0	5.4	16.1	0	0	0.1
120	0.0	5.4	16.1	0	0	0.1
135	0.0	5.4	16.1	1	0	0.1
150	0.0	5.3	16.2	0	0	0.1
165	0.0	5.3	16.3	0	0	0.1
180	0.0	5.1	16.5	0	0	0.1
195	0.0	4.9	16.8	0	0	0.1

Max CH ₄ (%)	0.0
Max CO ₂ (%)	5.4
Min O ₂ (%)	16.1
Max CO (ppm)	1
Max H ₂ S (ppm)	0
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.2	0.2	0.2	33.56

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	14/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Falling	Calibration check details:	See note 2 below
b) At start (mB):	996	Next calibration date:	June 2026
Recorded by:	DP	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	13	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS02	12:22:00	35	Dry	4.08

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.7	0	0	0.1
15	0.0	3.0	19.3	0	0	0.1
30	0.0	3.0	17.9	0	0	0.1
45	0.0	3.0	17.8	0	0	0.1
60	0.0	2.9	17.9	0	0	0.1
75	0.0	2.9	18.1	0	0	0.1
90	0.0	2.8	18.3	0	0	0.1
105	0.0	2.8	18.3	0	0	0.1
120	0.0	2.8	18.3	0	0	0.1
135	0.0	2.9	18.2	0	0	0.1
150	0.0	2.9	18.1	0	0	0.1
165	0.0	2.9	18.1	0	0	0.1
180	0.0	2.9	18.1	0	0	0.1
195	0.0	2.8	18.2	0	0	0.1

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.0
Min O ₂ (%)	17.8
Max CO (ppm)	0
Max H ₂ S (ppm)	0
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	33.37

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	14/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Falling	Calibration check details:	See note 2 below
b) At start (mB):	996	Next calibration date:	June 2026
Recorded by:	DP	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	11	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH01	12:55:00	50	Dry	4.90

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.3	21.1	0	0	0.0
15	0.0	3.6	19.9	1	0	0.0
30	0.0	3.6	19.1	0	0	0.0
45	0.0	3.6	19.0	0	0	0.0
60	0.0	3.6	19.0	0	0	0.0
75	0.0	3.6	19.0	0	0	0.0
90	0.0	3.6	19.0	0	0	0.0
105	0.0	3.6	19.0	0	0	0.0
120	0.0	3.6	19.0	0	0	0.0
135	0.0	3.6	19.0	0	0	0.0
150	0.0	3.6	19.0	0	0	0.0
165	0.0	3.6	19.0	0	0	0.0
180	0.0	3.6	19.0	1	0	0.0
195	0.0	3.5	19.1	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.6
Min O ₂ (%)	19.0
Max CO (ppm)	1
Max H ₂ S (ppm)	0
Max PID (ppm)	0.0

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	33.30

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	14/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Falling	Calibration check details:	See note 2 below
b) At start (mB):	996	Next calibration date:	June 2026
Recorded by:	DP	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	11	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH02	12:40:00	50	Dry	4.56

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.2	20.7	0	0	0.0
15	0.0	3.3	19.5	0	0	0.0
30	0.0	3.4	18.5	0	0	0.0
45	0.0	3.4	18.4	0	0	0.0
60	0.0	3.4	18.4	1	0	0.0
75	0.0	3.4	18.4	0	0	0.0
90	0.0	3.4	18.4	0	0	0.0
105	0.0	3.4	18.4	0	0	0.0
120	0.0	3.4	18.4	0	0	0.0
135	0.0	3.4	18.4	0	0	0.0
150	0.0	3.4	18.5	0	0	0.0
165	0.0	3.4	18.5	0	0	0.0
180	0.0	3.4	18.5	0	0	0.0
195	0.0	3.3	18.5	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.4
Min O ₂ (%)	18.4
Max CO (ppm)	1
Max H ₂ S (ppm)	0
Max PID (ppm)	0.0

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	33.52

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	29/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Steady 1018	Calibration check details:	See note 2 below
b) At start (mB):		Next calibration date:	June 2026
Recorded by:	CA	Notes: 1) Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit 2) Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture 3) CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide	
Surface ground conditions:	Dry		
Weather conditions:	Sunny		
Ambient air temp (°C):	22		

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS01	11:07:00	35	Dry	3.92

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.3	20.3	0	0	0.2
15	0.0	4.2	17.1	0	0	0.8
30	0.0	4.3	16.9	0	0	2.5
45	0.0	4.3	16.8	0	0	2.6
60	0.0	4.3	16.9	0	0	2.7
75	0.0	4.3	16.9	0	0	2.6
90	0.0	4.3	16.9	0	0	2.6
105	0.0	4.3	16.9	0	0	2.6
120	0.0	4.3	16.9	0	1	2.4
135	0.0	4.2	17.0	0	1	2.4
150	0.0	4.1	17.1	0	1	2.2
165	0.0	4.0	17.3	0	1	2.2
180	0.0	3.8	17.4	0	1	2.2
195	0.0	3.6	17.5	0	1	2.2

Max CH ₄ (%)	0.0
Max CO ₂ (%)	4.3
Min O ₂ (%)	16.8
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	2.7

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
-0.1	-0.1	0.0	0.03

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	29/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Steady 1017	Calibration check details:	See note 2 below
b) At start (mB):		Next calibration date:	June 2026
Recorded by:	CA	Notes: 1) Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit 2) Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture 3) CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide	
Surface ground conditions:	Dry		
Weather conditions:	Sunny		
Ambient air temp (°C):	21		

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS02	10:41:00	35	Dry	5.07

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.4	0	1	0.3
15	0.0	1.5	19.5	0	0	2.8
30	0.0	1.5	19.3	0	0	3.3
45	0.0	1.5	19.3	0	0	3.6
60	0.0	1.5	19.3	0	1	3.7
75	0.0	1.5	19.4	0	1	3.8
90	0.0	1.4	19.4	0	1	3.8
105	0.0	1.4	19.5	0	1	3.7
120	0.0	1.3	19.6	0	1	3.7
135	0.0	1.3	19.6	0	1	3.7
150	0.0	1.3	19.6	0	1	3.7
165	0.0	1.3	19.6	0	1	3.7
180	0.0	1.3	19.6	0	1	3.7
195	0.0	1.2	19.5	0	1	3.7

Max CH ₄ (%)	0.0
Max CO ₂ (%)	1.5
Min O ₂ (%)	19.3
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	3.8

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
-0.1	0.0	0.0	0.00

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	29/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Steady 1017	Calibration check details:	See note 2 below
b) At start (mB):		Next calibration date:	June 2026
Recorded by:	CA	Notes:	
Surface ground conditions:	Dry Sunny 21	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:		2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):		3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH01	10:54:00	50	Dry	4.98

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.2	20.1	0	1	0.2
15	0.0	3.1	18.4	0	1	1.1
30	0.0	3.1	18.2	0	1	3.7
45	0.0	3.1	18.1	0	1	3.7
60	0.0	3.1	18.1	0	1	3.6
75	0.0	3.1	18.1	0	1	3.4
90	0.0	3.1	18.1	0	1	3.2
105	0.0	3.1	18.1	0	1	3.0
120	0.0	3.1	18.1	0	1	2.9
135	0.0	3.2	18.1	0	1	2.8
150	0.0	3.2	18.1	0	1	2.7
165	0.0	3.2	18.1	0	1	2.6
180	0.0	3.2	18.0	0	1	2.5
195	0.0	3.1	18.1	0	0	2.3

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.2
Min O ₂ (%)	18.0
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	3.7

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	0.03

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	29/05/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Steady 1017	Calibration check details:	See note 2 below
b) At start (mB):		Next calibration date:	June 2026
Recorded by:	CA	Notes:	
Surface ground conditions:	Dry Sunny	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:		2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	21	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH02	10:27:00	50	4.56	4.62

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.7	0	0	2.1
15	0.0	0.6	20.5	0	0	4.5
30	0.0	0.6	20.4	0	0	6.2
45	0.0	0.6	20.4	0	0	6.3
60	0.0	0.6	20.4	0	0	6.3
75	0.0	0.6	20.4	0	0	6.1
90	0.0	0.6	20.4	0	0	5.9
105	0.0	0.5	20.4	0	0	5.7
120	0.0	0.5	20.4	0	0	5.3
135	0.0	0.5	20.4	0	0	5.2
150	0.0	0.4	20.4	0	0	5.0
165	0.0	0.4	20.4	0	0	4.9
180	0.0	0.4	20.4	0	0	4.8
195	0.0	0.4	20.3	0	0	4.7

Max CH ₄ (%)	0.0
Max CO ₂ (%)	0.6
Min O ₂ (%)	20.3
Max CO (ppm)	0
Max H ₂ S (ppm)	0
Max PID (ppm)	6.3

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.1	0.0	0.1	0.05

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	12/06/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	1014	Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	8	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS01	09:18:00	35	Dry	3.89

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.6	0	0	0.0
15	0.0	4.4	18.3	0	0	0.0
30	0.0	4.5	17.4	0	0	0.0
45	0.0	4.6	17.3	0	0	0.0
60	0.0	4.6	17.3	0	0	0.0
75	0.0	4.6	17.3	0	0	0.0
90	0.0	4.6	17.3	0	0	0.0
105	0.0	4.6	17.3	0	1	0.0
120	0.0	4.6	17.3	0	1	0.0
135	0.0	4.6	17.3	1	1	0.0
150	0.0	4.5	17.3	0	1	0.0
165	0.0	4.4	17.4	0	0	0.0
180	0.0	4.3	17.5	0	1	0.0
195	0.0	4.0	17.7	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	4.6
Min O ₂ (%)	17.3
Max CO (ppm)	1
Max H ₂ S (ppm)	1
Max PID (ppm)	0.0

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
-0.1	0.0	0.0	33.33

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	12/06/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	1014	Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	8	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS02	09:05:37	35	Dry	5.04

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.5	0	0	0.4
15	0.0	2.6	19.0	0	0	0.4
30	0.0	2.6	18.0	0	0	0.3
45	0.0	2.6	17.9	1	0	0.3
60	0.0	2.6	17.9	0	0	0.3
75	0.0	2.6	17.9	0	0	0.3
90	0.0	2.5	18.0	0	0	0.3
105	0.0	2.5	18.0	0	1	0.2
120	0.0	2.5	18.1	0	0	0.2
135	0.0	2.4	18.1	0	0	0.2
150	0.0	2.4	18.1	0	0	0.2
165	0.0	2.4	18.1	1	1	0.2
180	0.0	2.4	18.1	0	1	0.2
195	0.0	2.3	18.2	0	0	0.2

Max CH ₄ (%)	0.0
Max CO ₂ (%)	2.6
Min O ₂ (%)	17.9
Max CO (ppm)	1
Max H ₂ S (ppm)	1
Max PID (ppm)	0.4

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
-0.1	-0.1	0.0	34.27

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	12/06/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):		Calibration check details:	See note 2 below
b) At start (mB):	Rising 1014	Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	8	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH01	09:27:51	50	Dry	4.95

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.4	20.3	0	0	0.0
15	0.0	3.5	18.9	0	0	0.0
30	0.0	3.5	18.1	0	0	0.0
45	0.0	3.6	18.1	0	0	0.0
60	0.0	3.6	18.1	0	0	0.0
75	0.0	3.6	18.1	0	0	0.0
90	0.0	3.6	18.1	0	1	0.0
105	0.0	3.6	18.1	0	0	0.0
120	0.0	3.6	18.1	0	1	0.0
135	0.0	3.6	18.0	0	1	0.0
150	0.0	3.6	18.0	0	1	0.0
165	0.0	3.6	18.0	0	1	0.0
180	0.0	3.6	18.0	0	1	0.0
195	0.0	3.5	18.1	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.6
Min O ₂ (%)	18.0
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	0.0

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.1	0.2	0.2	34.96

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	12/06/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	1014	Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Wet	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Cloudy	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	8	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH02	08:54:14	50	4.56	4.57

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.8	0	0	0.5
15	0.0	0.1	20.9	0	0	0.5
30	0.0	0.1	20.9	0	0	0.4
45	0.0	0.1	20.8	0	0	0.4
60	0.0	0.1	20.8	0	0	0.4
75	0.0	0.1	20.8	0	0	0.4
90	0.0	0.1	20.8	0	0	0.4
105	0.0	0.1	20.8	0	0	0.4
120	0.0	0.1	20.8	0	0	0.4
135	0.0	0.2	20.7	0	0	0.3
150	0.0	0.2	20.7	0	0	0.3
165	0.0	0.2	20.7	0	0	0.3
180	0.0	0.2	20.7	0	0	0.3
195	0.0	0.2	20.6	0	0	0.3

Max CH ₄ (%)	0.0
Max CO ₂ (%)	0.2
Min O ₂ (%)	20.6
Max CO (ppm)	0
Max H ₂ S (ppm)	0
Max PID (ppm)	0.5

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	34.20

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	24/06/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	1011	Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Dry	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Sunny	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	27	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS01	09:19:20	35	Dry	3.87

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.1	20.6	0	0	0.4
15	0.0	4.3	18.0	0	1	0.4
30	0.0	4.4	17.3	0	1	0.5
45	0.0	4.4	17.2	0	1	0.5
60	0.0	4.5	17.1	0	1	0.5
75	0.0	4.5	17.1	0	1	0.6
90	0.0	4.5	17.1	0	1	0.6
105	0.0	4.5	17.0	0	1	0.6
120	0.0	4.5	17.0	0	1	0.6
135	0.0	4.4	17.0	0	1	0.6
150	0.0	4.3	17.2	0	1	0.6
165	0.0	4.1	17.4	0	1	0.7
180	0.0	3.8	17.6	0	1	0.6
195	0.0	3.5	17.6	0	1	0.6

Max CH ₄ (%)	0.0
Max CO ₂ (%)	4.5
Min O ₂ (%)	17.0
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	0.7

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
-0.1	-0.1	0.0	0.12

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	24/06/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	1011	Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Dry	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Sunny	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	27	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
WS02	09:45:23	35	Dry	5.02

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.4	18.9	1	1	0.1
15	0.0	2.8	17.0	1	1	0.1
30	0.0	2.8	16.3	0	1	0.0
45	0.0	2.8	16.3	0	1	0.0
60	0.0	2.8	16.4	0	1	0.0
75	0.0	2.8	16.4	0	1	0.0
90	0.0	2.8	16.5	0	1	0.0
105	0.0	2.8	16.6	0	2	0.0
120	0.0	2.8	16.6	0	2	0.0
135	0.0	2.8	16.7	0	2	0.0
150	0.0	2.8	16.7	0	2	0.0
165	0.0	2.8	16.7	0	2	0.0
180	0.0	2.8	16.7	0	2	0.0
195	0.0	2.7	16.8	0	1	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	2.8
Min O ₂ (%)	16.3
Max CO (ppm)	1
Max H ₂ S (ppm)	2
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	0.0	0.0	36.64

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	24/06/2026	Monitoring equipment	
Barometric pressure:		Instrument:	GA5000. No. G505055
a) Trend (24hrs):	Rising	Calibration check details:	See note 2 below
b) At start (mB):	1011	Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Dry	1)	Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit
Weather conditions:	Sunny	2)	Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture
Ambient air temp (°C):	27	3)	CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH01	09:32:29	50	4.92	4.94

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.5	19.4	0	1	0.1
15	0.0	3.1	18.3	0	1	0.1
30	0.0	3.2	17.8	0	1	0.0
45	0.0	3.2	17.7	0	1	0.0
60	0.0	3.2	17.7	0	1	0.0
75	0.0	3.2	17.7	0	1	0.0
90	0.0	3.2	17.7	0	1	0.0
105	0.0	3.2	17.7	0	1	0.0
120	0.0	3.2	17.6	0	1	0.0
135	0.0	3.2	17.6	0	1	0.0
150	0.0	3.2	17.6	0	1	0.0
165	0.0	3.2	17.6	0	1	0.0
180	0.0	3.2	17.5	0	1	0.0
195	0.0	3.1	17.4	0	1	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	3.2
Min O ₂ (%)	17.4
Max CO (ppm)	0
Max H ₂ S (ppm)	1
Max PID (ppm)	0.1

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.0	-0.1	0.0	36.95

Site & Location	Denville Hall, 62 Ducks Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
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Results of groundwater / gas monitoring

Date:	24/06/2026	Monitoring equipment	
Barometric pressure:	Rising 1011	Instrument:	GA5000. No. G505055
a) Trend (24hrs):		Calibration check details:	See note 2 below
b) At start (mB):		Next calibration date:	June 2026
Recorded by:	RL	Notes:	
Surface ground conditions:	Dry Sunny 27	1) Barometric pressure trend and ambient air temperature is recorded from metoffice.gov.uk website on the day of the monitoring visit	
Weather conditions:		2) Calibration check is performed at start of monitoring against ambient air and also periodically with a 5% CH ₄ , 5% CO ₂ and 6% O ₂ gas mixture	
Ambient air temp (°C):		3) CH ₄ = methane; CO ₂ = carbon dioxide; CO = carbon monoxide; O ₂ = oxygen; H ₂ S = hydrogen sulphide	

BH ID	Time (24hr)	Pipe dia (mm)	GW depth (mbgl)	Depth to pipe base (mbgl)
BH02	09:58:54	50	4.55	4.57

Time (s)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CO (ppm)	H ₂ S (ppm)	PID (ppm)
0	0.0	0.2	19.8	1	1	0.5
15	0.0	1.1	19.7	1	1	0.5
30	0.0	1.1	19.5	0	1	0.5
45	0.0	1.1	19.5	0	1	0.4
60	0.0	1.1	19.6	0	1	0.2
75	0.0	1.0	19.6	0	1	0.0
90	0.0	0.9	19.7	0	1	0.0
105	0.0	0.9	19.7	0	1	0.0
120	0.0	0.8	19.8	0	1	0.0
135	0.0	0.8	19.9	0	1	0.0
150	0.0	0.7	20.0	0	1	0.0
165	0.0	0.6	20.0	0	1	0.0
180	0.0	0.6	20.0	0	1	0.0
195	0.0	0.6	20.2	0	0	0.0

Max CH ₄ (%)	0.0
Max CO ₂ (%)	1.1
Min O ₂ (%)	19.5
Max CO (ppm)	1
Max H ₂ S (ppm)	1
Max PID (ppm)	0.5

Flow rate (l/hr)			Relative pressure (mb)
Initial	Mean	Max	
0.2	0.5	0.5	36.19

Site & Location	Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No:	10767/JW
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SUMMARY OF CLASSIFICATION TEST RESULTS

BH ID	Depth (m)	Type	w (%)	w _L (%)	w _p (%)	Pass 425 (%)	I _p (%)	Mod I _p (%)	I _L (%)	LOI (%)	Description
BH01	2.00	U	13	41	16	>95	25		-0.12		Light brown/reddish brown/greyish brown mottled slightly sandy silty CLAY with occasional gravel
BH01	3.00	D	14	39	15	>95	24		-0.05		Brown, mottled grey, slightly sandy silty CLAY
BH01	4.00	D	18	52	23	>95	29		-0.18		Dark reddish brown, mottled greyish blue, silty CLAY
WS01	0.90	D	11	39	16	>95	23		-0.22		Brown/greyish brown, speckled black, slightly sandy silty CLAY
WS01	1.20	D	12								Brown/greyish brown, speckled black, slightly sandy silty CLAY
WS01	1.60	D	13								Light orangish brown and light bluish grey mottled slightly gravelly silty CLAY
WS01	2.20	D	14								Light orangish brown and light bluish grey mottled slightly gravelly silty CLAY
WS01	2.50	D	12								Light orangish brown and light bluish grey mottled slightly gravelly silty CLAY
WS01	2.80	D	10	40	17	>95	23		-0.31		Light orangish brown and light bluish grey mottled slightly gravelly silty CLAY
WS01	3.20	D	13								Orangish brown, mottled bluish grey, silty CLAY
WS01	3.50	D	17	43	17	>95	26		0.00		Orangish brown, mottled bluish grey, silty CLAY
WS02	1.60	D	16	45	20	>95	25		-0.16		Light brown/light grey/bluish grey mottled slightly sandy silty CLAY with occasional gravel
WS02	1.90	D	15								Light brown/light grey/bluish grey mottled slightly sandy silty CLAY with occasional gravel
WS02	2.20	D	20	48	21	>95	27		-0.04		Light orangish brown/light bluish grey mottled silty CLAY with occasional gravel
WS02	2.80	D	18								Light orangish brown/light bluish grey mottled silty CLAY with occasional gravel
WS02	3.20	D	17	35	16	>95	19		0.06		Light orangish brown/light bluish grey mottled silty CLAY
WS02	4.50	D	12								Light grey silty very sandy CLAY
WS03	0.80	D	22								Light orangish brown, mottled bluish grey and reddish brown, silty CLAY
WS03	1.50	D	14	43	16	>95	27		-0.08		Light orangish brown, mottled bluish grey and reddish brown, silty CLAY

Testing in accordance with BS EN ISO 17892 unless specified otherwise Date: 30 Sep 22

Modified Plasticity Index calculated in accordance with NHBC Standards Chapter 4.2 (reported if %passing 425mm <95%)

Percent passing 425µm: by estimation, by hand* or by sieving** (Classification Sheet 1 of 2)

Site & Location	Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No:	10767/JW
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SUMMARY OF CLASSIFICATION TEST RESULTS

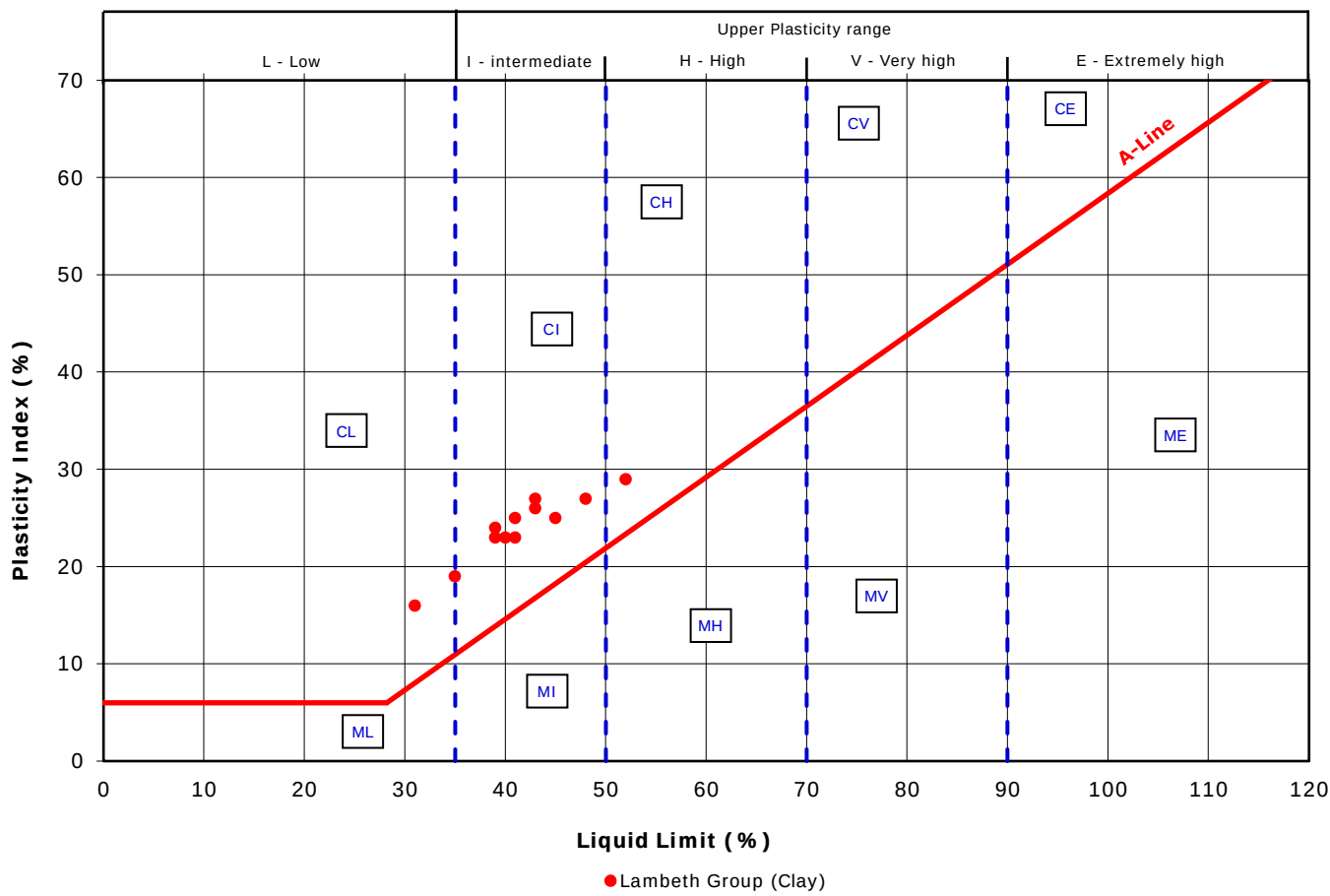
BH ID	Depth (m)	Type	w (%)	w _L (%)	w _p (%)	Pass 425 (%)	I _p (%)	Mod I _p (%)	I _L (%)	LOI (%)	Description
WS03	2.20	D	15								Orangish brown, mottled bluish grey, slightly sandy silty CLAY
WS03	2.50	D	15	41	18	>95	23		-0.14		Orangish brown, mottled bluish grey, slightly sandy silty CLAY
WS03	2.80	D	16								Orangish brown, mottled bluish grey, slightly sandy silty CLAY
WS03	3.20	D	15								Orangish brown, mottled bluish grey, slightly sandy silty CLAY
WS03	3.50	D	14	31	15	>95	16		-0.07		Orangish brown, mottled bluish grey, slightly sandy silty CLAY

Testing in accordance with BS EN ISO 17892 unless specified otherwise Date: 30 Sep 22

Modified Plasticity Index calculated in accordance with NHBC Standards Chapter 4.2 (reported if %passing 425mm <95%)

Percent passing 425µm: by estimation, by hand* or by sieving** (Classification Sheet 2 of 2)

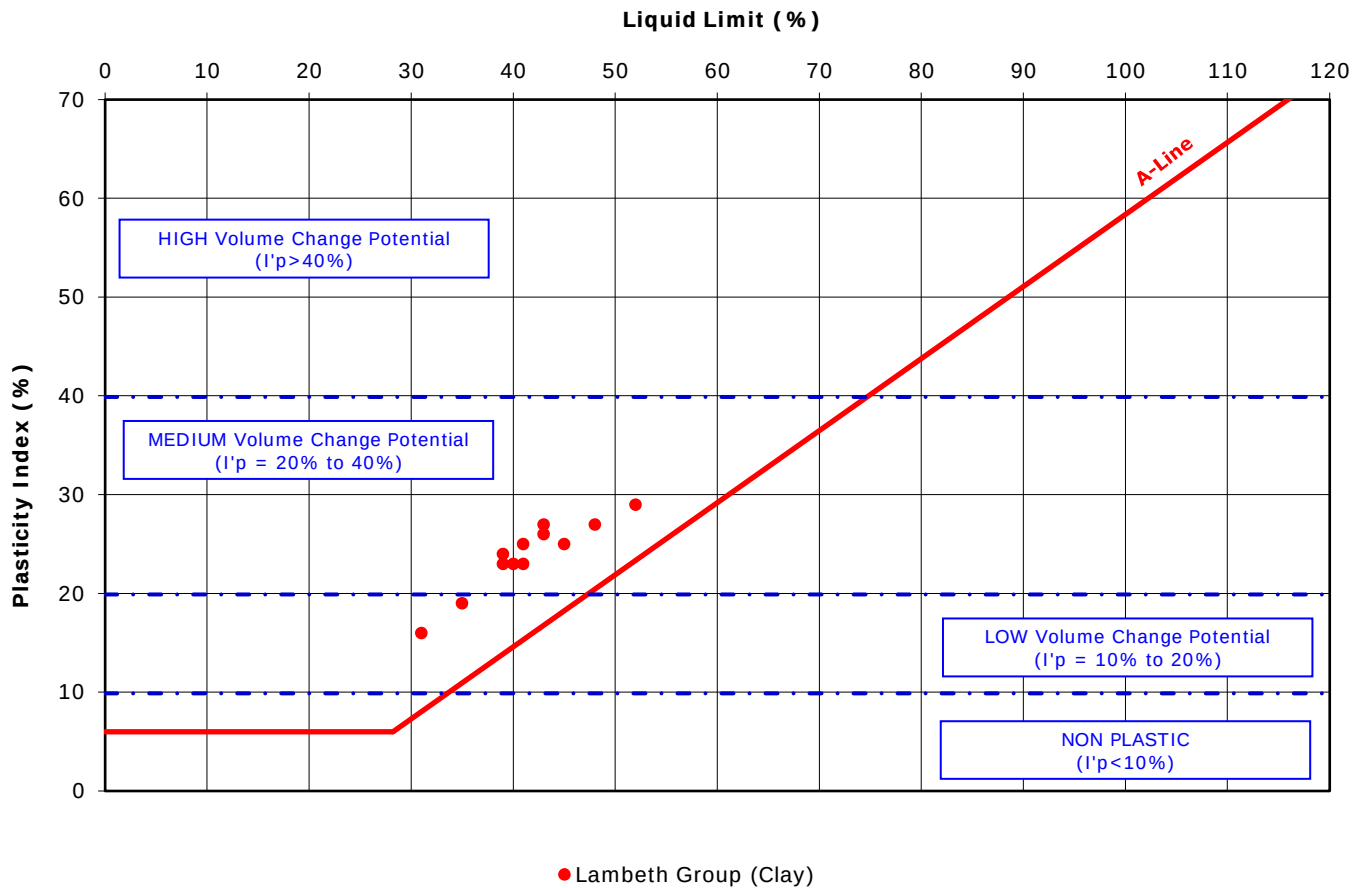
Plasticity Chart



M - SILT [plots below the A-Line]
C - CLAY [plots above the A-Line]

Classification in accordance with BS5930:2015 "Code of practice for site investigations"

Plasticity Chart



Modified Plasticity Index, I'_p :

$$I'_p = \frac{I_p \times (\% \text{ passing } 425\text{mm})}{100\%} \quad (\text{where } I_p = \text{Plasticity Index})$$

Classification in accordance with NHBC Standards, Part 4 'Foundations', Chapter 4.2 'Building near trees'

Site & Location	Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No:	10767/JW
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SUMMARY OF UNDRAINED SHEAR STRENGTH TEST RESULTS

BH ID	Depth (m)	Moisture content (%)	Bulk density (Mg/m ³)	Dry density (Mg/m ³)	Cell pressure (kPa)	Deviator stress (kPa)	Failure strain (%)	Failure mode	Undrained cohesion (kPa)	Remarks
BH01	2.00	13	2.15	1.90	40	608	3.90	B	304	

Testing in accordance with BS EN ISO 17892. UU = unconsolidated, undrained; MUU = multistage, unconsolidated, ϵ Date: 08 September 22

Unless stated otherwise: a) Rate of strain = 2mm/min and b) Standard latex membrane used with thickness = 0.5mm

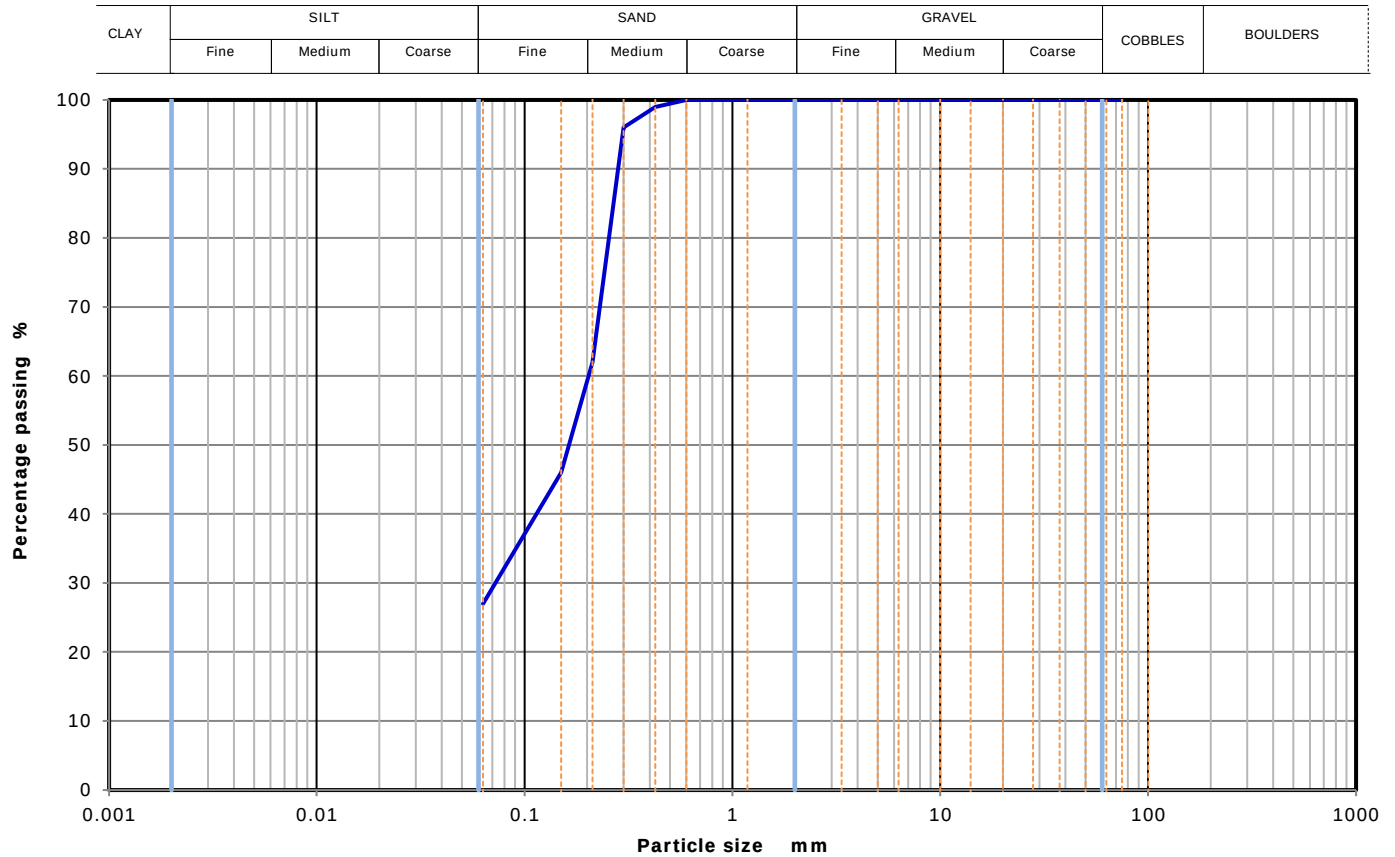
Failure modes: B = brittle, I = intermediate, P = plastic

(Triaxial Sheet 1 of 1)

Report **10767 / JW**
No:

Particle size distribution

Hole ID: BH01	Description: Light grey clayey silty SAND
Depth (m): 5.00	



Sieving	
Size (mm)	% passing
75	100.0
63	100.0
50	100.0
37.5	100.0
28	100.0
20	100.0
14	100.0
10	100.0
6.3	100.0
5	100.0
3.35	100.0
2	100.0
1.18	100.0
0.6	100.0
0.425	99.0
0.3	96.0
0.212	62.0
0.15	46.0
0.063	27.0

Sedimentation	
Size (μm)	% passing

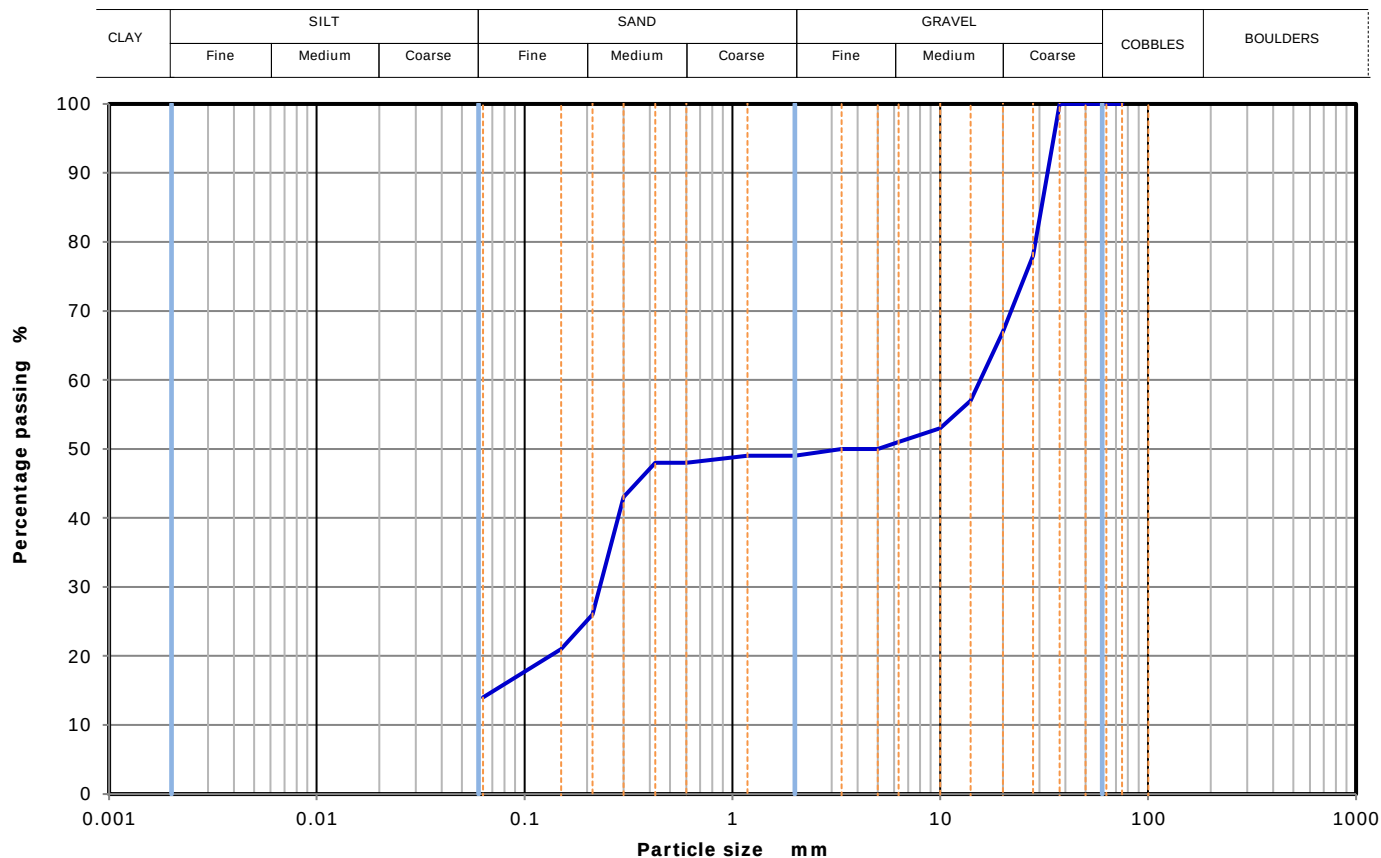
Sample proportions	%
Cobbles	0
Gravel	0
Sand	73
Fines (<0.063mm)	27

Grading analysis		
D60	mm	0
D30	mm	0
D10	mm	N/A
Uniformity Coefficient		
Curvature Coefficient		

Test method and date	
Method: BS EN ISO 17892-4:2016 - Wet sieving method	
Reporting date:	09 Sep 22

Particle size distribution

Hole ID: BH01	Description: Greyish green silty very sandy GRAVEL
Depth (m): 7.50	



Sieving	
Size (mm)	% passing
75	100.0
63	100.0
50	100.0
37.5	100.0
28	78.0
20	67.0
14	57.0
10	53.0
6.3	51.0
5	50.0
3.35	50.0
2	49.0
1.18	49.0
0.6	48.0
0.425	48.0
0.3	43.0
0.212	26.0
0.15	21.0
0.063	14.0

Sedimentation	
Size (µm)	% passing

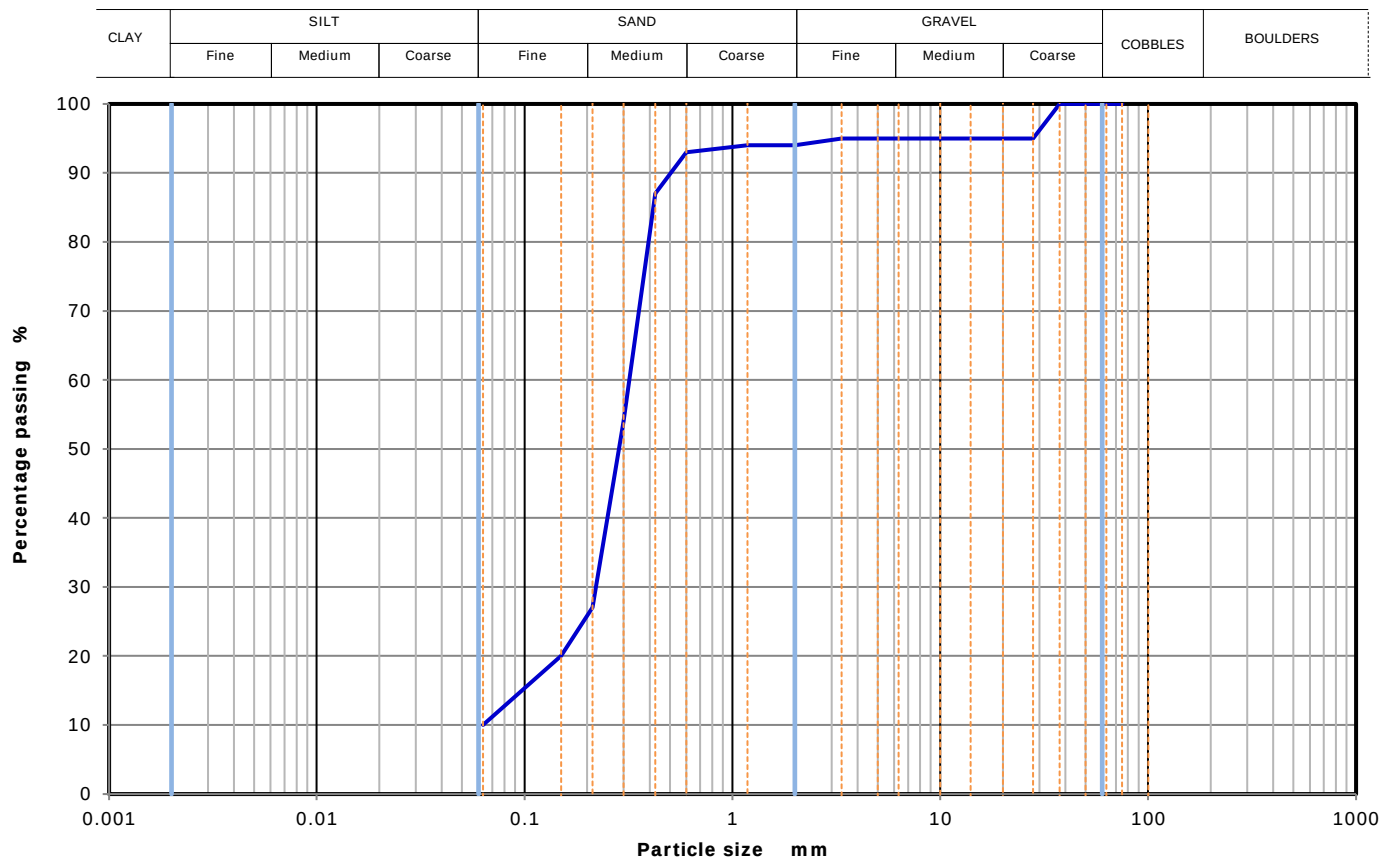
Sample proportions	%
Cobbles	0
Gravel	51
Sand	35
Fines (<0.063mm)	14

Grading analysis		
D60	mm	16
D30	mm	0
D10	mm	N/A
Uniformity Coefficient		
Curvature Coefficient		

Test method and date	
Method: BS EN ISO 17892-4:2016	
- Wet sieving method	
Reporting date:	09 Sep 22

Particle size distribution

Hole ID: BH02	Description: Brown/greenish brown silty gravelly SAND
Depth (m): 9.00	



Sieving	
Size (mm)	% passing
75	100.0
63	100.0
50	100.0
37.5	100.0
28	95.0
20	95.0
14	95.0
10	95.0
6.3	95.0
5	95.0
3.35	95.0
2	94.0
1.18	94.0
0.6	93.0
0.425	87.0
0.3	54.0
0.212	27.0
0.15	20.0
0.063	10.0

Sedimentation	
Size (μm)	% passing

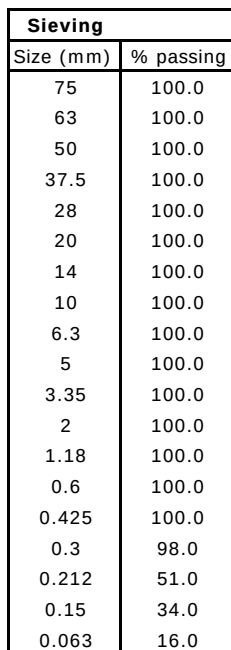
Sample proportions	%
Cobbles	0
Gravel	6
Sand	84
Fines (<0.063mm)	10

Grading analysis		
D60	mm	0
D30	mm	0
D10	mm	0
Uniformity Coefficient		5
Curvature Coefficient		2

Test method and date	
Method: BS EN ISO 17892-4:2016	
- Wet sieving method	
Reporting date:	09 Sep 22

Report **10767 / JW**
No:

Hole ID: WS02 Depth (m): 4.50	Description: Light grey clayey silty SAND
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Sedimentation	
Size (μm)	% passing

Sample proportions	%
Cobbles	0
Gravel	0
Sand	84
Fines (<0.063mm)	16

Grading analysis		
D60	mm	0
D30	mm	0
D10	mm	N/A
Uniformity Coefficient		
Curvature Coefficient		

Test method and date	
Method: BS EN ISO 17892-4:2016	
- Wet sieving method	
Reporting date:	09 Sep 22

FOREWORD TO CONTAMINATION TESTING AND ASSESSMENT

The following statements are designed to inform and guide the Client and other potential parties intending to rely upon this report, with the express intent of protecting them from misunderstanding as to the extent and thus the potential associated risks that may result from proceeding without further evaluations or guidance.

- 1] Unless otherwise stated in this report, the testing of soils and waters is based on a range of commonly occurring potential contaminants for the specific purpose of providing a general guidance evaluation for the proposed form of development. Thus, the range of potential contaminants is neither exhaustive nor specifically targeted to any previous known uses or influences upon the site.
- 2] The amount and scope of the testing should not be assumed to be exhaustive but has been selected, at this stage, to provide a reasonable, general view of the site ground conditions. In many cases this situation is quite sufficient for the site to be characterised for the purposes of development and related Health and Safety matters for persons involved in or directly affected by the site development works. It must be understood, however, that in certain circumstances aspects or areas of the site may require further investigation and testing in order to fully clarify and characterise contamination issues, both for regulatory compliance and for commercial reasons.
- 3] The scope of the contamination testing must not automatically be regarded as being sufficient to fully formulate a remediation scheme. For such a scheme it may be necessary to consider further testing to verify the effectiveness of the remedial work after the site has been treated. It must be understood that a remediation scheme which brings a site into a sufficient state for the proposed development ("fit for purpose") under current legislation and published guidance, may result in some contamination being left in-situ. It is possible that forthcoming legislation may result in a site being classified by the Local Authority and assigned a "Degree of Risk" related to previous use or known contamination.
- 4] The scope of the environmental investigation and contamination testing must not be automatically regarded as sufficient to satisfy the requirements in the wider environmental setting. The risks to adjacent properties and to the water environment are assessed by the regulatory authorities and there may be a requirement to carry out further exploration, testing and, possibly monitoring in the short or long term. It is not possible to sensibly predict the nature and extent of such additional requirements as these are the direct result of submissions to and liaison with the regulatory authorities. It is imperative, therefore, that such submissions and contacts are made as soon as possible, especially if there are perceived to be critical features of the site and proposed scheme, in this context.
- 5] New testing criteria have been implemented by the Environment Agency to enable a waste disposal classification to be made. The date of implementation of this Waste Acceptance Criteria [WAC] was July 2005. It is this testing that will be used by the waste regulatory authorities, including waste disposal sites, to designate soils for disposal in landfill sites. In certain circumstances, to satisfy the waste regulations, there may be the necessity to carry out additional testing to clarify and confirm the nature of any contamination that may be present. If commercial requirements are significant then this process may also necessitate further field operations to clarify the extent of certain features. Thus, the waste classification must be obtained from the waste regulation authorities or a licensed waste disposal site and we strongly recommend that this classification is obtained as soon as possible and certainly prior to establishing any costings or procedures for this or related aspects of the scheme.



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ME17 2JN
t: 01622 850410

DETS Report No: 22-07242

Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB

Project / Job Ref: 10767/JW

Order No: 10767/JW

Sample Receipt Date: 26/08/2022

Sample Scheduled Date: 26/08/2022

Report Issue Number: 1

Reporting Date: 05/09/2022

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.



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Soil Analysis Certificate						
DETS Report No: 22-07242	Date Sampled	22/08/22	23/08/22	23/08/22	23/08/22	23/08/22
Soil Consultants Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB	TP / BH No	BH01	BH02	WS01	WS03	S1
Project / Job Ref: 10767/JW	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 10767/JW	Depth (m)	0.25	0.50	0.40	0.50	0.20
Reporting Date: 05/09/2022	DETS Sample No	610577	610578	610579	610580	610581

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected		Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.0		5.9	7.2	7.5
Electrical Conductivity	uS/cm	< 5	NONE	33		37	63	253
Total Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	338		426	315	910
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.03		0.04	0.03	0.09
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	55		32	22	19
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.06		0.03	0.02	0.02
Total Sulphur	%	< 0.02	NONE	< 0.02		< 0.02	< 0.02	0.06
Organic Matter (SOM)	%	< 0.1	MCERTS	0.2		1.7	1.3	6.5
Arsenic (As)	mg/kg	< 2	MCERTS	8		10	21	11
W/S Boron	mg/kg	< 1	NONE	< 1		< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2		< 0.2	< 0.2	0.4
Chromium (Cr)	mg/kg	< 2	MCERTS	8		17	15	20
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	6		11	19	29
Lead (Pb)	mg/kg	< 3	MCERTS	18		28	87	312
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	6		12	16	25
Selenium (Se)	mg/kg	< 2	MCERTS	< 3		< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	16		34	46	108
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
EPH (C10 - C40)	mg/kg	< 6	MCERTS	9		19	27	363

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 22-07242	Date Sampled	23/08/22	23/08/22	23/08/22	23/08/22	
Soil Consultants Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB	TP / BH No	S2	WS02	S4	S5	
Project / Job Ref: 10767/JW	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: 10767/JW	Depth (m)	0.20	0.50	0.20	0.20	
Reporting Date: 05/09/2022	DETS Sample No	610582	610583	610584	610585	

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.2	I/S	6.2	6.7
Electrical Conductivity	uS/cm	< 5	NONE	83	I/S	126	114
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	479	314	505	700
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.05	0.03	0.05	0.07
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	16	12	16
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	0.02	0.01	0.02
Total Sulphur	%	< 0.02	NONE	0.03	0.02	0.03	0.05
Organic Matter (SOM)	%	< 0.1	MCERTS	2.3	2	5.6	7.1
Arsenic (As)	mg/kg	< 2	MCERTS	15	14	14	7
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.4	0.4	0.6	0.4
Chromium (Cr)	mg/kg	< 2	MCERTS	19	18	15	20
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	24	29	40	25
Lead (Pb)	mg/kg	< 3	MCERTS	83	253	419	144
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	21	15	15	17
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	145	94	172	87
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
EPH (C10 - C40)	mg/kg	< 6	MCERTS	58	9	131	125

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 22-07242	Date Sampled	22/08/22	23/08/22	23/08/22	23/08/22	23/08/22
Soil Consultants Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, HILLINGDON, HA6 2SB	TP / BH No	BH01	WS01	WS03	S1	S2
Project / Job Ref: 10767/JW	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 10767/JW	Depth (m)	0.25	0.40	0.50	0.20	0.20
Reporting Date: 05/09/2022	DETS Sample No	610577	610579	610580	610581	610582

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.56	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.50	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.15	7.31	0.19
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	2.23	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.40	13.50	0.91
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.41	11.70	0.90
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.28	6.68	0.64
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.32	5.03	0.59
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.44	6.55	0.77
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.18	2.20	0.30
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.42	6.53	0.75
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.33	3.38	0.51
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.62	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.28	2.89	0.43
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	3.2	69.7	6



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 22-07242	Date Sampled	23/08/22	23/08/22	23/08/22		
Soil Consultants Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB	TP / BH No	WS02	S4	S5		
Project / Job Ref: 10767/JW	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 10767/JW	Depth (m)	0.50	0.20	0.20		
Reporting Date: 05/09/2022	DETS Sample No	610583	610584	610585		

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.45	0.14	
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	< 0.1	
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	1.31	0.49	
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	1.13	0.44	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.72	0.38	
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.86	0.41	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	1.08	0.60	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.42	0.22	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.87	0.50	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.68	0.40	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	< 0.1	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.50	0.38	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	8.3	4	



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Soil Analysis Certificate - PCB (7 Congeners)						
DETS Report No: 22-07242	Date Sampled	23/08/22				
Soil Consultants Ltd	Time Sampled	None Supplied				
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB	TP / BH No	S5				
Project / Job Ref: 10767/JW	Additional Refs	None Supplied				
Order No: 10767/JW	Depth (m)	0.20				
Reporting Date: 05/09/2022	DETS Sample No	610585				

Determinand	Unit	RL	Accreditation				
PCB Congener 28	mg/kg	0.008	NONE	< 0.008			
PCB Congener 52	mg/kg	0.008	NONE	< 0.008			
PCB Congener 101	mg/kg	0.008	NONE	< 0.008			
PCB Congener 118	mg/kg	0.008	NONE	< 0.008			
PCB Congener 138	mg/kg	0.008	NONE	< 0.008			
PCB Congener 153	mg/kg	0.008	NONE	< 0.008			
PCB Congener 180	mg/kg	0.008	NONE	< 0.008			
Total PCB (7 Congeners)	mg/kg	< 0.1	NONE	< 0.1			

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2

DETS Report No: 22-07242		Date Sampled	22/08/22			Landfill Waste Acceptance Criteria Limits		
Soil Consultants Ltd		Time Sampled	None Supplied					
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB		TP / BH No	BH01					
Project / Job Ref: 10767/JW		Additional Refs	None Supplied					
Order No: 10767/JW		Depth (m)	0.25					
Reporting Date: 05/09/2022		DETS Sample No	610577					
Determinand	Unit	MDL				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
TOC ^{MU}	%	< 0.1	0.1			3%	5%	6%
Loss on Ignition	%	< 0.01	0.81			--	--	10%
BTEX ^{MU}	mg/kg	< 0.05	< 0.05			6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1			1	--	--
Mineral Oil ^{MU}	mg/kg	< 10	< 10			500	--	--
Total PAH ^{MU}	mg/kg	< 1.7	< 1.7			100	--	--
pH ^{MU}	pH Units	N/a	8.0			--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1			--	To be evaluated	To be evaluated
Eluate Analysis			10:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic ^U		< 0.01			< 0.1	0.5	2	25
Barium ^U		< 0.02			< 0.2	20	100	300
Cadmium ^U		< 0.0005			< 0.005	0.04	1	5
Chromium ^U		< 0.005			< 0.05	0.5	10	70
Copper ^U		< 0.01			< 0.1	2	50	100
Mercury ^U		< 0.0005			< 0.005	0.01	0.2	2
Molybdenum ^U		< 0.001			< 0.01	0.5	10	30
Nickel ^U		< 0.007			< 0.07	0.4	10	40
Lead ^U		< 0.005			< 0.05	0.5	10	50
Antimony ^U		< 0.005			< 0.05	0.06	0.7	5
Selenium ^U		< 0.005			< 0.05	0.1	0.5	7
Zinc ^U		< 0.005			< 0.05	4	50	200
Chloride ^U		2.3			23	800	15000	25000
Fluoride ^U		< 0.5			< 5	10	150	500
Sulphate ^U		1.9			19	1000	20000	50000
TDS		17			170	4000	60000	100000
Phenol Index		< 0.01			< 0.1	1	-	-
DOC		12.8			128	500	800	1000
Leach Test Information								
Sample Mass (kg)			0.09					
Dry Matter (%)			96.3					
Moisture (%)			4					
Stage 1								
Volume Eluate L10 (litres)			0.90					

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation
 M Denotes MCERTS accredited test
 U Denotes ISO17025 accredited test

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2																																				
DETS Report No: 22-07242		Date Sampled	23/08/22		Landfill Waste Acceptance Criteria Limits <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 33%; text-align: center;">Inert Waste Landfill</th> <th style="width: 33%; text-align: center;">Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th style="width: 33%; text-align: center;">Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">3%</td> <td style="text-align: center;">5%</td> <td style="text-align: center;">6%</td> </tr> <tr> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> <td style="text-align: center;">10%</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td style="text-align: center;">500</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td style="text-align: center;">100</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td style="text-align: center;">--</td> <td style="text-align: center;">>6</td> <td style="text-align: center;">--</td> </tr> <tr> <td style="text-align: center;">--</td> <td style="text-align: center;">To be evaluated</td> <td style="text-align: center;">To be evaluated</td> </tr> </tbody> </table>					Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	3%	5%	6%	--	--	10%	6	--	--	1	--	--	500	--	--	100	--	--	--	>6	--	--	To be evaluated	To be evaluated
Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill																																		
3%	5%	6%																																		
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1	--	--																																		
500	--	--																																		
100	--	--																																		
--	>6	--																																		
--	To be evaluated	To be evaluated																																		
Soil Consultants Ltd		Time Sampled	None Supplied																																	
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB		TP / BH No	BH02																																	
Project / Job Ref: 10767/JW		Additional Refs	None Supplied																																	
Order No: 10767/JW		Depth (m)	0.50																																	
Reporting Date: 05/09/2022		DETS Sample No	610578																																	
Determinand	Unit	MDL																																		
TOC ^{MU}	%	< 0.1		1.5																																
Loss on Ignition	%	< 0.01		2.93																																
BTEX ^{MU}	mg/kg	< 0.05		< 0.05																																
Sum of PCBs	mg/kg	< 0.1		< 0.1																																
Mineral Oil ^{MU}	mg/kg	< 10		35																																
Total PAH ^{MU}	mg/kg	< 1.7		166																																
pH ^{MU}	pH Units	N/a		8.1																																
Acid Neutralisation Capacity	mol/kg (+/-)	< 1		< 1																																
Eluate Analysis				10:1 mg/l			Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																												
Arsenic ^U				0.03			0.3	0.5	2	25																										
Barium ^U				< 0.02			< 0.2	20	100	300																										
Cadmium ^U				< 0.0005			< 0.005	0.04	1	5																										
Chromium ^U				< 0.005			< 0.05	0.5	10	70																										
Copper ^U				< 0.01			< 0.1	2	50	100																										
Mercury ^U				< 0.0005			< 0.005	0.01	0.2	2																										
Molybdenum ^U				0.003			0.03	0.5	10	30																										
Nickel ^U				< 0.007			< 0.07	0.4	10	40																										
Lead ^U				< 0.005			< 0.05	0.5	10	50																										
Antimony ^U				< 0.005			< 0.05	0.06	0.7	5																										
Selenium ^U				< 0.005			< 0.05	0.1	0.5	7																										
Zinc ^U				< 0.005			< 0.05	4	50	200																										
Chloride ^U				2.0			20	800	15000	25000																										
Fluoride ^U				< 0.5			< 5	10	150	500																										
Sulphate ^U				7.8			78	1000	20000	50000																										
TDS				49			490	4000	60000	100000																										
Phenol Index				< 0.01			< 0.1	1	-	-																										
DOC				15.8			158	500	800	1000																										
Leach Test Information																																				
Sample Mass (kg)				0.09																																
Dry Matter (%)				95.2																																
Moisture (%)				5																																
Stage 1																																				
Volume Eluate L10 (litres)				0.90																																
Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation M Denotes MCERTS accredited test U Denotes ISO17025 accredited test																																				



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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 22-07242	
Soil Consultants Ltd	
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB	
Project / Job Ref: 10767/JW	
Order No: 10767/JW	
Reporting Date: 05/09/2022	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
610577	BH01	None Supplied	0.25	3.8	Brown sandy clay with stones
610578	BH02	None Supplied	0.50	4.7	Brown sandy clay with stones
610579	WS01	None Supplied	0.40	8	Light brown sandy clay with stones and brick
610580	WS03	None Supplied	0.50	14.4	Light brown sandy clay with stones
610581	S1	None Supplied	0.20	7.1	Light brown sandy clay with vegetation and brick
610582	S2	None Supplied	0.20	10.9	Brown sandy clay with stones
610583	WS02	None Supplied	0.50	9.9	Brown sandy clay with stones
610584	S4	None Supplied	0.20	9.2	Brown sandy clay with stones and brick
610585	S5	None Supplied	0.20	8.3	Brown sandy clay with stones and vegetation

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

Insufficient Sample ^{1/s}

Unsuitable Sample ^{u/s}



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 22-07242

Soil Consultants Ltd

Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, HILLINGDON, HA6 2SB

Project / Job Ref: 10767/JW

Order No: 10767/JW

Reporting Date: 05/09/2022

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 (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
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 (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



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Water Analysis Certificate - Methodology & Miscellaneous Information	
DETS Report No: 22-07242	
Soil Consultants Ltd	
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon, HA6 2SB	
Project / Job Ref: 10767/JW	
Order No: 10767/JW	
Reporting Date: 05/09/2022	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

Parameter	Matrix Type	Suite Reference	Expanded Uncertainty Measurement	Unit
TOC	Soil	BS EN 12457	20.0	%
Loss on Ignition	Soil	BS EN 12457	35.0	%
BTEX	Soil	BS EN 12457	14.0	%
Sum of PCBs	Soil	BS EN 12457	23.0	%
Mineral Oil	Soil	BS EN 12457	9.0	%
Total PAH	Soil	BS EN 12457	11.6	%
pH	Soil	BS EN 12457	0.28	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18.0	%
Arsenic	Leachate	BS EN 12457	18.7	%
Barium	Leachate	BS EN 12457	11.6	%
Cadmium	Leachate	BS EN 12457	20.3	%
Chromium	Leachate	BS EN 12457	18.3	%
Copper	Leachate	BS EN 12457	24.3	%
Mercury	Leachate	BS EN 12457	23.7	%
Molybdenum	Leachate	BS EN 12457	14.7	%
Nickel	Leachate	BS EN 12457	16.1	%
Lead	Leachate	BS EN 12457	15.7	%
Antimony	Leachate	BS EN 12457	17.9	%
Selenium	Leachate	BS EN 12457	22.0	%
Zinc	Leachate	BS EN 12457	17.4	%
Chloride	Leachate	BS EN 12457	15.3	%
Fluoride	Leachate	BS EN 12457	16.4	%
Sulphate	Leachate	BS EN 12457	20.6	%
TDS	Leachate	BS EN 12457	12.0	%
Phenol Index	Leachate	BS EN 12457	14.0	%
DOC	Leachate	BS EN 12457	10.0	%
Clay Content	Soil	BS 3882: 2015	15.0	%
Silt Content	Soil	BS 3882: 2015	14.0	%
Sand Content	Soil	BS 3882: 2015	13.0	%
Loss on Ignition	Soil	BS 3882: 2015	35.0	%
pH	Soil	BS 3882: 2015	0.14	Units
Carbonate	Soil	BS 3882: 2015	16.0	%
Total Nitrogen	Soil	BS 3882: 2015	12.0	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24.0	%
Potassium (Extractable)	Soil	BS 3882: 2015	20.0	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26.0	%
Zinc	Soil	BS 3882: 2015	14.9	%
Copper	Soil	BS 3882: 2015	16.0	%
Nickel	Soil	BS 3882: 2015	17.7	%
Available Sodium	Soil	BS 3882: 2015	23.0	%
Available Calcium	Soil	BS 3882: 2015	23.0	%
Electrical Conductivity	Soil	BS 3882: 2015	10.0	%



James Williams
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HP15 6QT

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 22-07320

Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB

Project / Job Ref: 10767/JW

Order No: 10767/JW

Sample Receipt Date: 31/08/2022

Sample Scheduled Date: 31/08/2022

Report Issue Number: 1

Reporting Date: 06/09/2022

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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.



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



Soil Analysis Certificate						
DETS Report No: 22-07320	Date Sampled	22/08/22	22/08/22	23/08/22	23/08/22	23/08/22
Soil Consultants Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB	TP / BH No	BH01	BH01	BH02	BH02	WS01
Project / Job Ref: 10767/JW	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 10767/JW	Depth (m)	2.75	6.50	5.00	9.00	1.20
Reporting Date: 06/09/2022	DETS Sample No	610951	610952	610953	610954	610955

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	8.3	8.4	8.3	8.7	6.8
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200	582	< 200	715	333
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02	0.06	< 0.02	0.07	0.03
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	16	18	14	92	74
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.02	0.02	0.01	0.09	0.07
Total Sulphur	%	< 0.02	NONE	< 0.02	0.03	< 0.02	0.06	< 0.02

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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



Soil Analysis Certificate						
DETS Report No: 22-07320	Date Sampled	23/08/22	23/08/22	23/08/22	23/08/22	23/08/22
Soil Consultants Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB	TP / BH No	WS01	WS02	WS02	WS03	WS03
Project / Job Ref: 10767/JW	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 10767/JW	Depth (m)	2.80	1.90	3.80	0.80	2.80
Reporting Date: 06/09/2022	DETS Sample No	610956	610957	610958	610959	610960

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	5.4	8.2	8.1	8.2	8.1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200	< 200	< 200	< 200	< 200
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	47	17	32	< 10	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.05	0.02	0.03	< 0.01	< 0.01
Total Sulphur	%	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Tel : 01622 850410



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 22-07320
Soil Consultants Ltd
Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB
Project / Job Ref: 10767/JW
Order No: 10767/JW
Reporting Date: 06/09/2022

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
610951	BH01	None Supplied	2.75	8.2	Light brown sandy clay
610952	BH01	None Supplied	6.50	3.7	Green sandy clay with stones
610953	BH02	None Supplied	5.00	8.5	Light brown sandy clay
610954	BH02	None Supplied	9.00	1.9	Brown sandy clay with stones
610955	WS01	None Supplied	1.20	7.9	Brown sandy clay
610956	WS01	None Supplied	2.80	8.4	Light brown sandy clay
610957	WS02	None Supplied	1.90	12.6	Light brown sandy clay
610958	WS02	None Supplied	3.80	12.5	Light brown sandy clay
610959	WS03	None Supplied	0.80	15.2	Light brown clay
610960	WS03	None Supplied	2.80	12	Light brown sandy clay

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

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 22-07320

Soil Consultants Ltd

Site Reference: Denville Hall, 62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB

Project / Job Ref: 10767/JW

Order No: 10767/JW

Reporting Date: 06/09/2022

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 (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
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 (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Certificate of Analysis

Certificate Number 26-10580

Issued: 15-May-26

Client Soil Consultants Ltd
Chiltern House
Earl Howe Road
Holmer Green
High Wycombe
Buckinghamshire
HP15 6QT

Our Reference 26-10580

Client Reference ~ 10767/JW

Order No ~ (not supplied)

Contract Title ~ Denville Hall, Ducks Hill Road, Northwood, London, HA6 2SB

Description 15 Soil samples.

Date Received 05-May-26

Date Started 05-May-26

Date Completed 15-May-26

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

A handwritten signature in black ink, appearing to read "R. Irfan".

Reyhan Irfan
Operations Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 26-10580

Client Ref ~ 10767/JW

Contract Title ~ Denville Hall, Ducks Hill Road, Northwood, London, HA6 2SB

Lab No	2680846	2680847	2680848	2680849	2680850	2680851
Sample ID ~	S101	S102	S102	S103	S104	S105
Depth ~	0.50	0.20	0.50	0.20	0.20	0.20
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	30/04/2026	30/04/2026	30/04/2026	30/04/2026	30/04/2026	30/04/2026
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	DETSC 3301	0.1	mg/kg	< 0.10	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	0.28	< 0.10	0.24	0.14	0.27
Pyrene	DETSC 3301	0.1	mg/kg	< 0.10	0.19	< 0.10	0.23	0.12	0.26
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	0.54	< 0.10	0.13	< 0.10	< 0.10
Chrysene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	0.15	< 0.10	0.12
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	0.17	< 0.10	0.14	< 0.10	< 0.10
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	0.20	< 0.10	0.18	0.11	0.17
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	0.26	< 0.10	< 0.10
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	1.6	< 1.6	< 1.6	< 1.6	< 1.6

Summary of Chemical Analysis

Soil Samples

Our Ref 26-10580

Client Ref ~ 10767/JW

Contract Title ~ Denville Hall, Ducks Hill Road, Northwood, London,

Lab No	2680852	2680853	2680854	2680855	2680856	2680857
Sample ID ~	S106	S106	S107	S108	S108	S109
Depth ~	0.20	0.50	0.20	0.20	0.50	0.20
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	30/04/2026	30/04/2026	30/04/2026	30/04/2026	30/04/2026	30/04/2026
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	0.19	< 0.10
Pyrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	0.20	< 0.10
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	0.15	< 0.10
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

Summary of Chemical Analysis

Soil Samples

Our Ref 26-10580

Client Ref ~ 10767/JW

Contract Title ~ Denville Hall, Ducks Hill Road, Northwood, London,

Lab No	2680858	2680859	2680860
Sample ID ~	S110	S111	S112
Depth ~	0.20	0.20	0.20
Other ID ~			
Sample Type ~	SOIL	SOIL	SOIL
Sampling Date ~	30/04/2026	30/04/2026	30/04/2026
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Fluorene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.10	0.32	0.13
Anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	1.0	0.27
Pyrene	DETSC 3301	0.1	mg/kg	< 0.10	0.86	0.19
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	0.56	< 0.10
Chrysene	DETSC 3301	0.1	mg/kg	< 0.10	0.61	< 0.10
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	0.61	< 0.10
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	0.36	< 0.10
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	0.70	0.19
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	0.70	0.12
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.10	0.54	< 0.10
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	5.4	< 1.6

Information in Support of the Analytical Results

Our Ref 26-10580
 Client Ref ~ 10767/JW
 Contract ~ Denville Hall, Ducks Hill Road, Northwood, London, HA6 2SB

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date		Containers Received	Holding time exceeded for tests	Incorrect container for tests
		Sampled ~				
2680846	S101 0.50 SOIL	30/04/26		GJ 250ml, PT 1L		
2680847	S102 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680848	S102 0.50 SOIL	30/04/26		GJ 250ml, PT 1L		
2680849	S103 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680850	S104 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680851	S105 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680852	S106 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680853	S106 0.50 SOIL	30/04/26		GJ 250ml, PT 1L		
2680854	S107 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680855	S108 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680856	S108 0.50 SOIL	30/04/26		GJ 250ml, PT 1L		
2680857	S109 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680858	S110 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680859	S111 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		
2680860	S112 0.20 SOIL	30/04/26		GJ 250ml, PT 1L		

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

Normec 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 250µm sieve

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

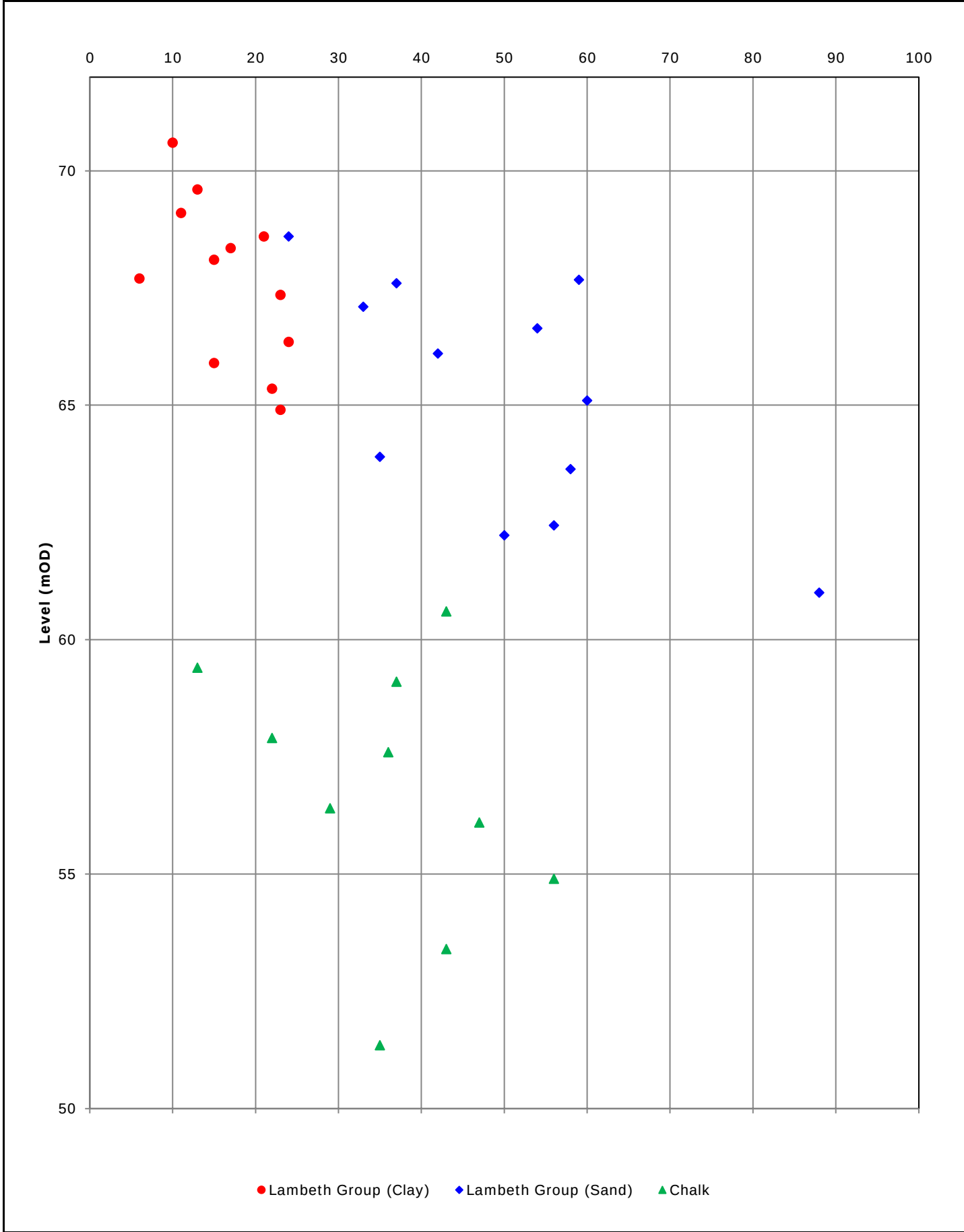
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

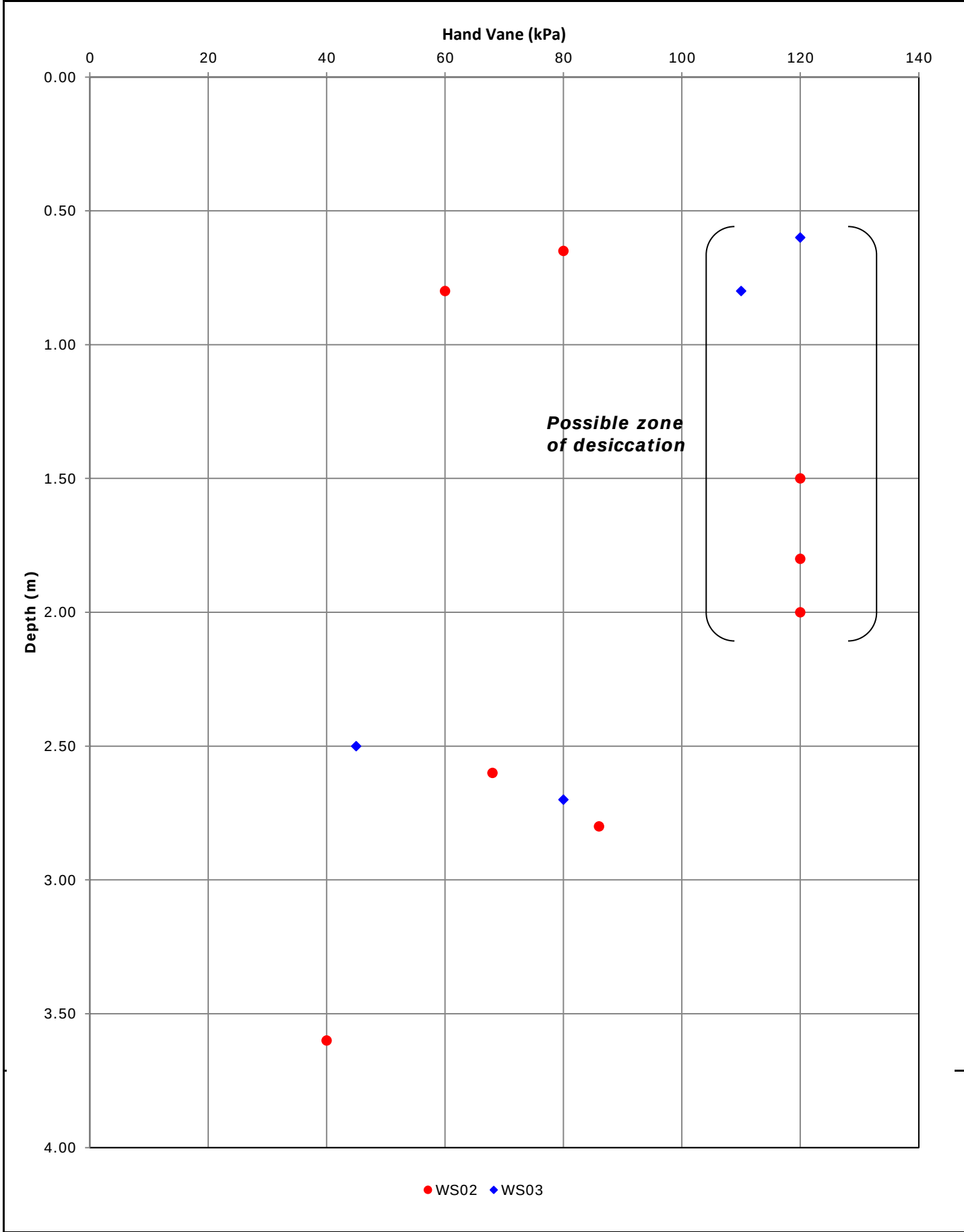
From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

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

SPT-N vs level



Hand Vane profile vs depth



Site &
Location:

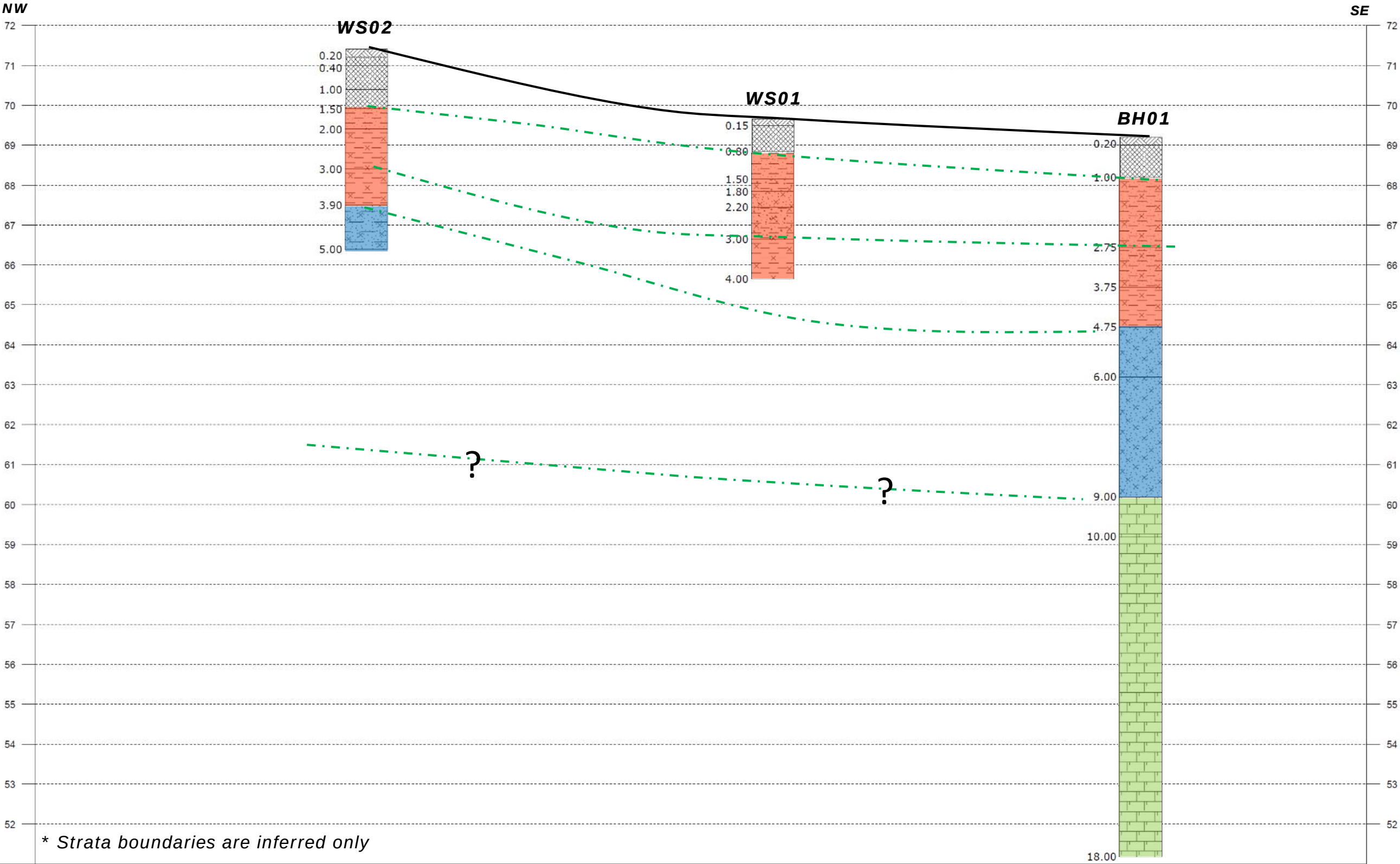
Denville Hall,
62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB

Section A-A'



Legend Key

- Topsoil
- Made ground
- Lambeth Group clay
- Lambeth Group sand
- Chalk



Site &
Location:

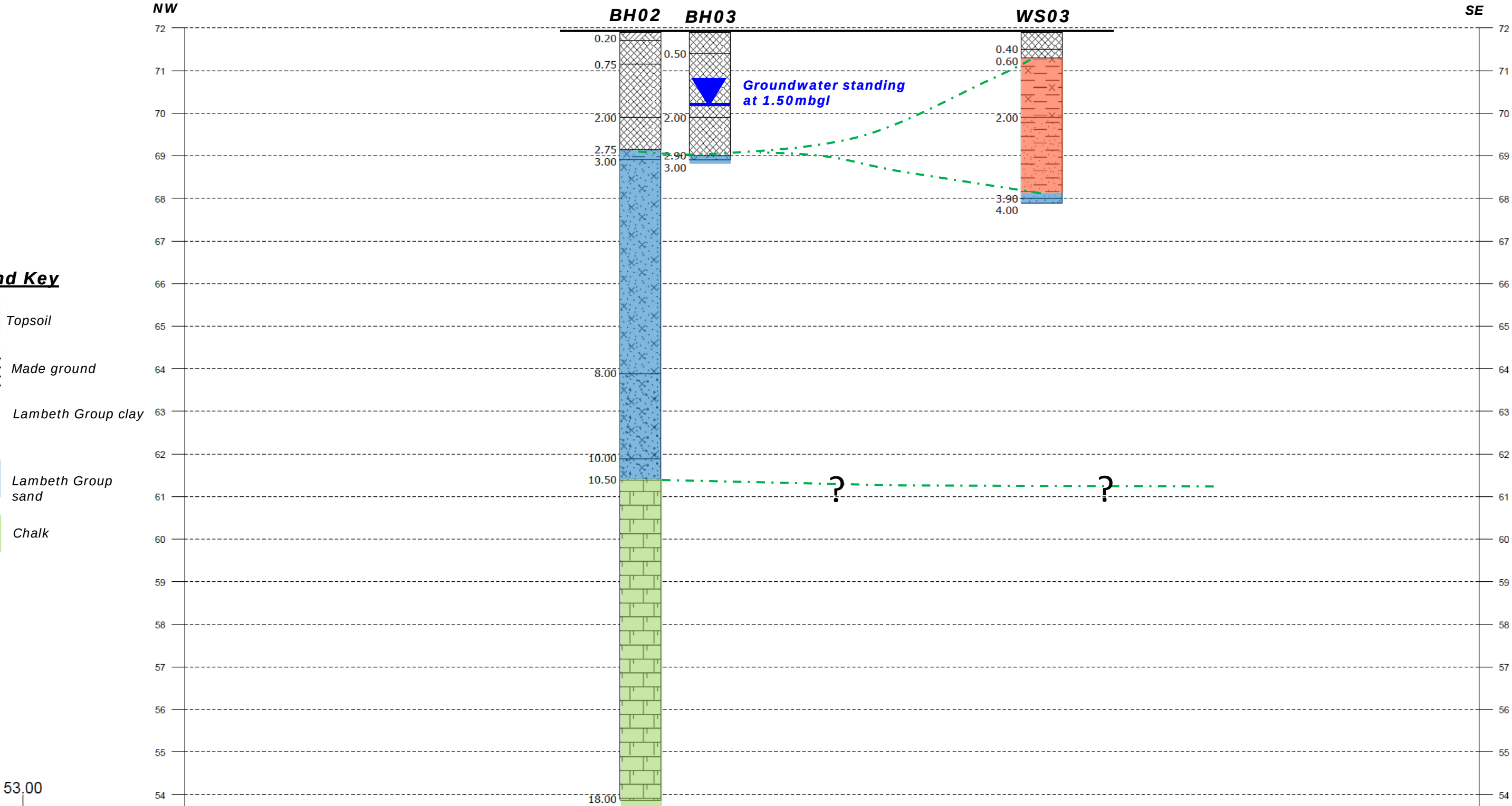
Denville Hall,
62 Duck's Hill Road, Northwood, Hillingdon HA6 2SB

Section B-B'



Legend Key

- Topsoil
- Made ground
- Lambeth Group clay
- Lambeth Group sand
- Chalk



* Strata boundaries are inferred only

Chainage (m)	0.00	19.88	23.66	41.67	62.96
Offset (m)		1.72	1.70	0.81	
Elevation (mAOD)		71.90	71.90	71.90	

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
Site photographs		

Photo No 1

Description:

**General view
of main
building from
the site
entrance**

**Direction:
Looking NW**

**Date:
23/08/22**



Photo No 2

Description:

**View of
derelict
bungalow and
surrounding
area**

**Direction:
Looking NNE**

**Date:
23/08/22**



Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
Site photographs		

Photo No 3	
Description: View of dense trees west of the existing derelict bungalow	
Direction: Looking W Date: 23/08/22	

Photo No 4	
Description: View of bin / waste storage area	
Direction: Looking E Date: 23/08/22	

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
Site photographs		

Photo No 5	
Description: View refrigeration / food storage unit	
Direction: Looking SW Date: 23/08/22	

Photo No 6	
Description: View of tended lawn area	
Direction: Looking NW Date: 23/08/22	

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
Site photographs		

Photo No 7	
Description: View of existing derelict apartment building	
Direction: Looking SW Date: 23/08/22	

Photo No 8	
Description: View of vegetation and outbuilding west of derelict apartment building	
Direction: Looking WSW Date: 23/08/22	

Site & Location	Denville Hall, Duck's Hill Road, Northwood, Hillingdon HA6 2SB	Report No: 10767/JW
Site photographs		

Photo No 9	
Description: Restricted view of parkland immediately west/north-west of site	
Direction: Looking WNW Date: 23/08/22	

Photo No 10	
Description: View of electricity substation on southern side of Duck's Hill Road	
Direction: Looking SSE Date: 23/08/22	



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Site: Denville Hall, 62 Ducks Hill Road, Middlesex,
M20 2SD

Drawing Title: Tree Constraints Plan

1:200 @ A1

Rev A
June 2021

Key:

- Category A
- Category B
- Category C
- Category U



NOTE: Tree/group numbers marked with an * have approximate location

