Appendix E – Geo-Environmental Assessment

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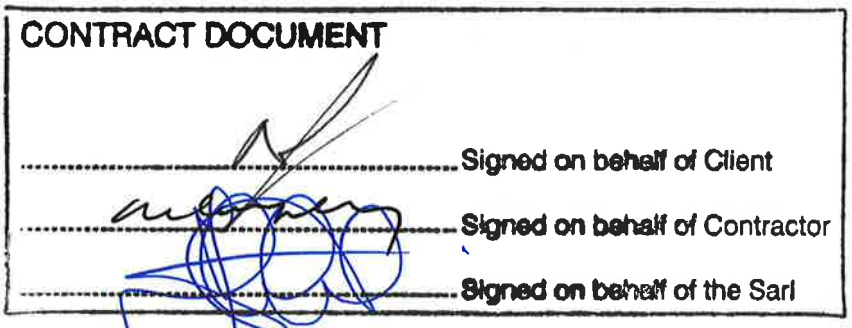
The Global Distribution Solution



MOD Records Office, Hayes, Middlesex

Phase II Geo-Environmental Assessment

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MOD RECORDS OFFICE, HAYES, MIDDLESEX

Phase II Geo-Environmental Assessment

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CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following parties:-

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

MOD RECORDS OFFICE, HAYES, MIDDLESEX

Phase II Geo-Environmental Assessment

SUMMARY

On the instruction of ProLogis Developments Limited a Geo-Environmental Assessment has been carried out at the MOD Records Office, Hayes, Middlesex. The main aim of the assessment is to identify potential geotechnical and environmental issues that may represent a constraint to the proposed redevelopment of the subject site for mixed commercial / residential end use.

Previous work has included a Phase I assessment undertaken by WSP in 2001 and a Phase II assessment undertaken by Gibb Environmental in 1998 which identified variable thicknesses of made ground overlying orange brown silty clay and orange brown sand and gravel, relatively low concentrations of inorganic and organic contaminants, 'hot-spots' of hydrocarbon contamination adjacent to heating oil AST's and oily materials encountered in services.

The ground investigation was carried out between 24th and 30th September 2003. The ground investigation comprised cable percussive and solid / hollow stem auger boreholes, trial pits, window sampling and CBR testing. The ground conditions encountered during the investigation comprise limited deposits of made ground overlying a natural sequence of Langley Silt, Lynch Hill Gravel and London Clay.

Concentrations of metals in soils across the site area have been identified as generally low and the site is considered suitable for residential and commercial end uses with limited requirements for future risk mitigation.

One area of concern identified by the investigation is a backfilled pond in the north of the proposed residential area, which contains waste debris and contaminated materials including significant concentrations of metals and hydrocarbons. These materials will require delineation and removal as part of the future development to ensure suitable protection to future residential site users.

A review of available information confirms that the proposed roundabout area includes domestic refuse materials (as identified by original ground investigations for the existing road). Prior to development further works will be required to assess the condition of this land and identify any potential geotechnical and contamination development issues.

WSP Environmental Limited

MOD RECORDS OFFICE, HAYES, MIDDLESEX

Phase II Geo-Environmental Assessment

1.0 INTRODUCTION

1.1 Authorisation

On the instruction of ProLogis Developments Limited a Geo-Environmental Assessment has been carried out at the MOD Records Office, Hayes, Middlesex (***Figure 1***).

1.2 Aims and Objectives

The main aim of the assessment is to identify potential geotechnical and environmental issues that may represent a constraint to the proposed redevelopment of the subject site for mixed commercial / residential end use. The proposed development scheme at the time of writing this report is presented in ***Figure 2*** and comprises:

- Commercial development of five distribution units with two and three storey offices, service yards, car parking and landscaped areas.
- Residential development of six residential housing blocks (communal areas of landscaping) with thirteen terrace houses (with private gardens), access roads and car parking.
- New roundabout on A408 Stockley Road to the west serving proposed Stockley Park business centre.

1.3 Scope of Works

The investigation comprised a phase 2 environmental and preliminary geotechnical site investigation that considered the following elements:

- an intrusive investigation over accessible areas of the subject site enabling consideration of potential environmental and preliminary geotechnical development constraints;
- installation and monitoring of groundwater and gas wells: and
- factual and interpretative reporting.

1.4 Previous Reports

The investigation has been based on the findings and recommendations of the following reports:

- Gibb Environmental, October 1998, Records Office, Bourne Avenue, Land Quality Assessment, Phase II: Desk Study Interpretive Report.
- Gibb Environmental, October 1998, Records Office, Bourne Avenue, Land Quality Statement Phase II: Intrusive Survey
- Norwest Holst, February 2001, Report on a Ground Investigation at TNT Archive Store, Hayes.

Pertinent data from the Gibb Environmental report is presented in ***Appendix A***.

These reports were reviewed as part of the following assessment:

- WSP Environmental Limited, January 2001, Phase I Environmental Due Diligence Audit. Ref. 210101.

The subsequent section summarises the findings of this report.

2.0 SITE SETTING AND DATA REVIEW

2.1 Site Details

Site Address:	MOD Records Office, Bourne Avenue, Hayes, Middlesex, UB3 1QF
National Grid Reference:	563750, 263905
Size:	14 Hectares
Description of Site:	The site comprises two main units used to store records with several ancillary buildings including offices, garages, workshops, fire station, compressor house and locomotive shed. Other site features include extensive areas of grass, rough grassland, air raid shelters and access routes.
Description of Surrounding Area:	The site is bounded by the Heathrow Express rail link to the north and west with industrial developments and the Grand Junction Canal beyond. Further to the west are the A408 and a golf course. The site is bounded to the east by residential development and to the south by a former BAA landfill.

The location of the site is presented on ***Figure 1***.

2.2 Summary of Phase I Assessment

Site Feature	Summary
Site History	The site comprised agricultural land until the Second World War when the site was developed as a Royal Ordnance Factory for the production of armaments. In the 1950's the site was taken over by the Public Records Office and is now an archive store currently used by the MOD and various other government departments and organisations.
Topography	The site is situated on a gentle slope associated with terraces of the post diversionary River Thames, which slopes gently to the south west. The site is situated at approximately 32.0mAOD. On the basis of regional topography, groundwater flow direction is indicted to be towards the south west.
Geology	BGS Sheet 269 indicates that the site is underlain by Langley Silt (a sandy clay and silt) over Lynch Hill Gravel (fourth terrace of River Thames). These superficial deposits overly London Clay. An area of worked ground is present in the south western corner of the site where Langley Silt, also known as Brickearth, has been excavated to expose underlying Lynch Hill Gravel in this locality, presumably to support historical brick production activities.
Hydrogeology	Based on the EA Groundwater Vulnerability of the Thames Estuary, Sheet 40; the strata underlying the site are classified as: *Langley Silt / London Clay* • Non Aquifers, negligible permeability with insignificant quantities of groundwater. *Lynch Hill Gravels* • Minor aquifer, unconsolidated deposit of variable permeability, capable of supporting locally important abstractions. One groundwater abstraction exists within 1km of the subject site, 750m northeast for spray irrigation utilising water from the Upper Chalk (directly beneath London Clay).

Site Feature	Summary
Hydrology	Surrounding water features comprise several ponds, adjacent to the west and the Grand Union Canal adjacent to the north west.
Landfill	Three disused landfills exist at Heathrow Express Rail Link, Stockley Park (20m south), Stockley Park East (100m south), Stockley Park West (100m south) and Goulds Great. Road (800m north west). These landfills have accepted, wastes including demolition / construction, industrial / process, asbestos, commercial, household / domestic, inert, liquids, sewage, non-toxic metals, interceptor wastes tars / paints / dyes and other Inorganic Materials. One current landfill license is held for Heathrow Express Rail Link, Stockley Park (250m south) accepting demolition / construction and inert wastes. The landfill is currently dormant.

2.3 Summary of Gibb Environmental Investigation

The following pertinent information was abstracted from the Gibb Environmental assessment which was carried out in 1998:

- The investigation comprised thirteen probe holes and associated chemical testing of soils.
- Ground conditions comprise variable thicknesses of made ground overlying orange brown silty clay and orange brown sand and gravel.
- Relatively low concentrations of inorganic and organic contaminants were recorded across site area.
- 'Hot-spots' of TPH were recorded at 1111mg/kg in PH1 (adjacent to heating oil AST's) and 3078mg/kg in PH13 (area where oily materials encountered in services).
- No significantly elevated concentrations of explosives chemicals were identified in areas of ordnance production.

Gibb Environmental data reviewed as part of this assessment is presented in full in ***Appendix A***.

2.4 Potential Contaminants

In addition to this assessment of APC's reference has been made To Environment Agency / DEFRA guidance: R&D Publication CLR 8 – Potential Contaminants for the Assessment of Land. This publication indicates that for "Engineering works: mechanical engineering and ordnance works," some or all of the following contaminants may be encountered:

Metals: beryllium, cadmium, chromium, copper, lead, mercury, nickel, vanadium, zinc
Semi-metals: arsenic, boron

Inorganics: free cyanide, nitrous oxide, sulphur dioxide

Others: asbestos, pH

Organics: phenol, acetone, aromatic hydrocarbons, PAH's, chlorinated aliphatic hydrocarbons, PCB's,

The presence of these contaminants has been assessed as appropriate during the intrusive works.

2.5 Potential Environmental Issues and Geotechnical Hazards

Based on the information obtained as part of this phase of the study (and intrusive works undertaken by Gibb Environmental), the following areas of potential concern (APC's) were identified for consideration (environmental and geotechnical):

Table 2.2: Summary of Site APC's

APC	Issue
1&2*	Presence of asbestos containing materials on site
3*	Potential ground and groundwater contamination may have occurred as a result of leaks and spills of heating oil at three above ground storage tanks
4*	Contamination from leaks and spills from underground storage tank containing diesel
5(a-d)*	Potential former use of PCB containing substations on site
6*	Ground contamination from former use as ordnance engineering workshops
7*	Migration of landfill gas from landfill sites to the south and north
8*	Area where oily material encountered within services
9	The locomotive shed and sidings situated to the west of the site
10	A former oil store/bunker (building R)
11	Fuelling post between buildings V and A
12	Garage Area to the east of the site (buildings H,J and S) including a fire station
13	Overgrown (possibly infilled) pond to the east of the site
14	The locomotive shed and crusher plant adjacent to building W
15	Pump House at the SE corner of building A
16	Compressor House north of building T
17	Weighbridge west of building U
18	Workshops and Boiler in building D
19	Spirit Store between buildings V and A
20	Uneven ground between buildings X and O
21	Worked ground over the south west of the site (as shown on geological map)

Notes:
* = APC identified by Gibb Environmental

The current site layout and APC's are presented in ***Figure 3***.

2.6 Additional Site Area – Overview

A review of the land to the west of the site, intended for the proposed new roundabout on the A408 has revealed:

- The area was part of the Stockley brick works brick field (presumably extracting Langley Silt or "Brickearth").
- BGS sheet 269 Windsor indicates the area comprises infilled ground associated with Brickearth extractions.
- The area has been classified as a Site of Importance for Nature Conservation (SINC).

Borehole logs obtained from the British Geological Society relating to investigations undertaken during construction of the A408 indicate that prior to road construction, ground conditions generally comprised:

0.0 – 0.5m	Topsoil
0.5 – 4.5m	Made ground comprising domestic refuse of degradable materials of paper, rags, wood and plant material, rubber, plastic, leather, stone and brick fragments.
4.5 – 4.55m	Soft to firm brown silty clay (Langley Silt)
4.55 – 8.0m	Very dense brown sandy gravel (Lynch Hill Gravels)
8.0 – 1.0m	Stiff blue grey fissured silty clay (London Clay)

On the basis of these logs it is considered that there is a potential for further domestic waste fill in the area of the proposed roundabout which will require further consideration and investigation.

BGS borehole logs are presented in ***Appendix B***.

3.0 SITE INVESTIGATION

3.1 Investigation Rationale

The ground investigation has been designed to provide information on the general ground and groundwater conditions at the site together with specific information on potential contamination sources. The rationale behind the location of each exploratory hole is summarised in Table 3.1. Also listed are exploratory holes undertaken by Gibb Environmental, from which data has been considered to prevent duplication

Table 3.1: Summary of Exploratory Hole Rationale

Potential Issue	APC	Exploratory holes
General site coverage including general groundwater quality	*N/A*	*All WSP holes*
Three above ground storage tanks – heating oil	*3*	*PH1, PH2, PH3, PH3A, PH3, WS8, WS14*
Underground storage tank containing diesel	*4*	*PH4, BH5, WS5*
PCB containing substations	*5*	*PH9*
Ordnance engineering workshops	*6*	*PH5: PH12*
Migration of landfill gas from landfill sites to the south and north	*7*	*BHG6, BHG8, BHG15, BHG16, BHG17, BHG18*
Area where oily material encountered within services	*8*	*PH12, BH8, WS1*
A former oil store/bunker (building R)	*10*	*BH10, WS9, WS11*
Fuelling post between buildings V and A	*11*	*WS12*
Garage Area to the east of the site (buildings H,J and S)	*12*	*WS6, WS7*
Overgrown (possibly infilled) pond to the east of the site	*13*	*BH4, TP11, TP12*
Pump House at the SE corner of building A	*15*	*WS10*
Workshops and Boiler in building D	*18*	*WS3, WS4*
Spirit Store between buildings V and A	*19*	*WS13*
Uneven ground	*20*	*TP9, TP15*
Worked ground over the south west of the site	*21*	*BH1, TP1: TP4*
California Bearing Ratio Tests – road / pavement design	*N/A*	*CBR1: CBR8*

3.2 Field Work

The ground investigation was carried out between 24th and 30th September 2003. The ground investigation comprised cable percussive and solid / hollow stem auger boreholes, trial pits, window sampling and CBR testing. A summary of the scope of the ground investigation is outlined in Table 3.2.

The ground investigation was undertaken in accordance with techniques outlined in BS5930:1999 and BS1377:1990, as appropriate, at the positions shown on ***Figure 4*** The exploratory hole records are presented in ***Appendix C***.

The investigation was carried out under the supervision of an engineer from WSP Environmental Limited.

Table 3.2: Summary of Ground Investigation Works

Investigation Method	No. of Positions	Maximum Depth (m)	Sampling Regime	Monitoring Wells	Backfilling and Reinstatement
Cable Percussion	6	10.0	(1), (2), (3)	Yes	NA
Hollow / Solid Stem Auger	4	8.0	(1)	Yes	NA
Large Diameter (110mm) Probes	14	4.0	(1)	No	Bentonite and concrete plug where necessary
Trial Pits	15	3.8	(1), (2), (4)	No	Arisings with nominal compaction by excavator bucket

Notes

(1) Plastic tubs, amber glass jars and 40ml glass volatile vials
(2) Bulk bags
(3) In situ tests comprising SPTs in granular materials and U100 alternated with SPTs in cohesive materials
(4) Hand shear vane measurements

Borehole Investigation

Six boreholes were drilled to a maximum depth of 10.0mbgl using cable percussion with associated in situ geotechnical testing and environmental samples. Clean drilling techniques comprising jet washing of borehole casing and tools between each borehole were employed to avoid cross contamination between exploratory holes.

Window Sampler Investigation

Targeted investigation was undertaken using the Archway Competitor window sample rig. The rig recovers soil samples in plastic sheaths to avoid cross contamination between exploratory holes.

Trial Pit Investigation

Trial pits were excavated predominately in areas of geotechnical concern including worked ground, uneven ground and a backfilled pond using a JCB 3CX mechanical excavator. Excavation of trial pits permitted detailed assessment of in situ ground conditions along with increasing site coverage for environmental data.

In Situ CBR Testing

A total of eight in situ CBR tests were carried out in shallow trial pits across the site. The nominal depth of the testing was at 0.5m below ground level.

Gas and Groundwater Monitoring Well Installation

Gas and groundwater monitoring wells were installed in each borehole and were constructed from 50mm perforated plastic pipe with a pea gravel surround and fitted with air tight gas valves. As a minimum requirement, each monitoring well comprised plain pipe from ground level to 1m with a bentonite pellet surround.

Monitoring well groundwater response zones were restricted to terrace gravel deposits (minor aquifer) exact details of each installation are shown on the borehole records. Gas monitoring installations were finished at ground level with a flush fitted lockable cover.

Well Development

Prior to sampling, monitoring wells were developed by the removal of approximately three well volumes. Wells were developed using dedicated Waterra inertia pumps.

Groundwater Sampling

Groundwater samples were taken from each monitoring well using dedicated Waterra inertia pumps. Groundwater samples were retained in appropriate containers (1-litre glass and plastic bottles and 40ml glass volatile vials) and transported to the testing laboratory on the same day as sampling.

Groundwater and Gas Monitoring

All boreholes were monitored for ground gas levels using an infra-red gas analyser (Gas Data LMSx) on two separate occasions. During gas monitoring, the water levels were measured using an electrical contact dip meter.

The results of the gas and groundwater monitoring are presented in ***Appendix D***.

3.3 Chemical Testing

Selected soil samples were submitted for chemical analysis at WSP Environmental's laboratory at Nottingham and TechniChem laboratories in Middlesex.

The results of the contamination testing are presented in ***Appendix E***.

Chemical Testing Strategy

The chemical testing suite has been designed to achieve the following:

- *Characterise near surface contamination levels to provide an assessment of the risks associated with human exposure to soils on site in its current state (CLEA Assessment).*
- *Characterise in detail visibly contaminated samples using targeted analytical testing techniques.*
- *Provide information on the solubility of contaminants and therefore the potential for impact on controlled waters.*
- *Provide information on the general contamination levels in the various fill types across the site.*

Soils – General

Selected samples were tested for the following contaminants on a total and leachable concentration basis:

Water soluble sulphate, pH, cyanide, arsenic, cadmium, lead, mercury, chromium, copper, nickel, zinc, phenols, and total petroleum hydrocarbons (TPH) and polynuclear aromatic hydrocarbons (PAHs).

Soils – Targeted

In addition, targeted samples were analysed for the following detailed organic characterisation tests:

- Volatile organic compounds (VOCs)
- BTEX Analysis including MTBE
- TPH Speciation
- PAH Speciation
- PCB's

Groundwaters – General

Groundwater samples were analysed for the following contaminants to provide information on general contamination levels and overall water quality:

Sulphate, pH, cyanide, ammoniacal nitrogen, chemical oxygen demand (COD), electrical conductivity, total organic carbon (TOC), arsenic, cadmium, lead, mercury, chromium, copper, nickel, zinc, and phenols (by HPLC).

Groundwaters – Targeted

This phase of works included preliminary laboratory testing for geotechnical properties. In addition, samples were analysed for the following detailed chemical characterisation tests:

- Volatile organic compounds (VOCs)
- BTEX Analysis including MTBE
- TPH Speciation
- Semi-volatile organic compounds (SVOCs)

3.4 Geotechnical Testing

Selected soil samples were tested for the following geotechnical parameters:

Moisture content, Atterberg Limits, particle size distribution, sedimentation, particle density, undrained shear strength, compaction and consolidation properties, California Bearing Ratio (CBR), sulphate, sulphide, chloride, pH, organic matter, and loss-on-ignition.

The results of the geotechnical testing are presented in ***Appendix F***.

4.0 GROUND AND GROUNDWATER CONDITIONS

4.1 Introduction

The ground conditions encountered during the investigation are generally consistent with the anticipated sequence of strata indicated by the desk study information. Based on information obtained during the ground investigation the ground conditions at the site generally comprise Langley Silt overlying Lynch Hill Gravel overlying London Clay. The general sequence of strata and associated geotechnical characteristics is summarised in Table 4.1:

Table 4.1: Summary of strata

Description	Made Ground	Langley Silt	Lynch Hill Gravel	London Clay
Depth to base of strata (mbgl)	0.1 – 2.7	0.6 – 2.9	1.3 – 7.5	Not proven
Mean thickness (m)	0.6	0.9	2.5	In excess of 100m
SPT 'N' Value	8	15 -25	25 to 76 (mean = 41)	13 to 37 (mean = 20)
Moisture Content (%)	12%	NT	NT	22 to 31%
Plasticity Index (%)	24%	NT	NT	47 to 54%
pH	5.8 to 11.4	5.9 to 10.5	8.0 to 8.2	3.7 to 6.7
Sulphate	<0.05 to 0.22	<0.05 to 6.05	<0.05	<0.05
Sulphate Class	NT	NT	DS-1	NT
Bulk Density (Mg/m^3)	NT	NT	NT	1.86 – 2.03
Dry Density (Mg/m^3)	NT	NT	NT	1.46 to 1.61

Notes: (1). NT is not tested
(2). DS-1 is concrete class from BRE Special Digest 1

Geological cross sections have been constructed in ***Figure 5*** and ***Figure 6*** to identify the site geological structure as discussed below.

4.2 Made Ground

Relatively limited deposits of made ground (average of 0.6m) have been identified across the site area with more substantial thickness of deposits in the south west of the site, presumably associated with backfilling in areas of excavated Langley Silt. In this area made ground comprises reworked sandy clay. Across the remainder of the site made ground comprises topsoil or hard standing over soft sandy clay and loose sandy gravel with fragments of brick, cement, concrete, ceramic and metal.

One discrete area of made ground was identified in TP12 which correlates with the suspected old pond. Fill materials in this area extend to 1.5mbgl and comprise brick, wood, metal,

asbestos sheeting, cables, breeze block, plastics, glass and concrete. TP12 was extended as a shallow trench to delineate the length of the backfill and was found to measure 28m. The likely extents of this area of fill are presented in ***Figure 7.***

4.3 Natural Ground

Langley Silt

Limited deposits (average of 0.9m) of Langley Silt were identified across discrete areas of the site according to areas of deposition and excavation. Langley Silt or Brickearth has been extracted as part of historical brick production in the south western area of the site whilst only limited deposits have been identified in the west and north of the site. The most significant volumes of these deposits were identified in the south east of the site. The Langley Silt was found to comprise a soft to firm friable orange brown gravelly, sandy but predominately silty clay

Lynch Hill Gravel

The Lynch Hill Gravels were identified across the whole site area and proven to be the main water bearing unit beneath the site. The deposits which comprise the fourth river terrace of the River Thames vary considerably in depth to base but are on average 2.5m in thickness and comprise a medium dense to dense orange brown gravelly medium to coarse sand (gravel is predominately flint).

London Clay

The London Clay stratum was encountered at a range of depths but was generally proven to exist at shallower depth along the site's south eastern perimeter. The stratum was identified as a firm to stiff grey mottled brown slightly gravelly clay.

4.4 Groundwater

Groundwater was encountered during the drilling works in the exploratory holes listed below. Following a water strike the water was left to stabilise for 20 minutes and the subsequent depth to the water recorded. The recorded groundwater strikes and subsequent rest levels are presented in Table 4.2.

Table 4.2: Recorded Groundwater Strikes

Exploratory hole	Ground level (mAOD)	Strike depth (m BGL)	Rest water depth after 20 mins (m BGL)	Rest water level (m AOD)	Strike Stratum
BH1	32.805	4.4	3.7	29.105	Lynch Hill Gravels
BH2	31.580	3.0	2.2	29.380	Lynch Hill Gravels
BH3	31.711	4.0	2.2	29.511	Lynch Hill Gravels

Exploratory hole	Ground level (mAOD)	Strike depth (m BGL)	Rest water depth after 20 mins (m BGL)	Rest water level (m AOD)	Strike Stratum
BH4	31.276	3.7	3.0	28.276	Lynch Hill Gravels
BH5	30.055	2.5	1.7	28.355	London Clay
BH6	31.537	4.0	2.7	28.837	Lynch Hill Gravels
BH7	31.778	1.7	2.0	29.778	Lynch Hill Gravels
BH8	31.651	2.5	3.0	28.651	Lynch Hill Gravels
BH9	30.918	1.8	1.8	29.118	Lynch Hill Gravels
BH10	31.432	2.5	2.5	28.932	Lynch Hill Gravels

Details of the groundwater strikes are shown on the exploratory hole records presented in ***Appendix C***.

5.0 CONTAMINATION

5.1 General

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

Tier 1 Assessment: *Comparison of site contaminant levels against generic standards and compliance criteria including an assessment of risk using the* ***source-pathway-target*** *model*

Tier 2 Assessment: *Derivation of site specific risk assessment criteria and calculation of site specific clean-up goals.*

5.2 Soil Contamination

5.2.1 General Contaminants

As part of the contamination assessment the chemical results have been screened against existing accepted compliance criteria, namely the Contaminated Land Exposure Assessment model (CLEA).

Due to the limited compliance data currently included within the CLEA model, the following standards have also been used to benchmark the site data:

- ICRCL Threshold Trigger Values (TTVs) for general contaminants (ICRCL Guidance Note 59/83: *Guidance on the Assessment and Redevelopment of Contaminated Land*, Second Edition, 1987). Although these set of guidelines have now been withdrawn they still serve as useful assessment criteria for the purpose of assessing potential phytotoxic effects and represent the only applicable UK guidance for some determinands.

Whilst the ICRCL guidance was withdrawn in 2002, no UK based alternative guidance is available and given that the values relate to phytotoxic contaminants rather than human heath, this is still considered best practise.

5.2.2 CLEA Methodology and Application to Subject Site

Chemical data for soils has been statistically analysed using methodologies published in (EA R&D Publication CLR 10 - The Contaminated Land Exposure Assessment Model (CLEA): Technical Basis and Algorithms. In particular, a mean value test and maximum value test have been undertaken on the data set to determine the statistical significance of the results.

It is intended that the CLEA methodology should be applied to samples from the upper 1.0m of the soil profile. This is due to the soil guideline values being based on risk to human health via various pathways from surface soils.

The CLEA statistical methodology produces two key outputs:

- The Mean Value Test, which calculates the Upper Bound Value (UBV) or 95th percentile of the mean. This enables a set of contamination results to be compared to the relevant Soil Guideline Value (SGV). If the UBV is less than the SGV, then the mean value test is passed, and the site may be considered not to present a significant possibility of significant harm in the context of Part IIA of the Environmental Protection Act 1990. Conversely, if the test is failed, further sampling, analysis, assessment and possibly remediation may be required.

- The Maximum Value Test, which calculates the Outlier Critical Value (OCV). This enables an assessment to be made of whether the highest value in a set of results belongs to the general 'population', or whether it represents a statistical outlier, i.e. a contamination 'hot-spot', not truly representative of the site conditions.

5.2.3 CLEA Averaging Zones

CLEA methodology requires the definition of averaging zones within the site area on the basis of previous / current spatial land use, soil type, proposed land use or other distinguishing features. As the proposed site end use is mixed and ground conditions are consistent across the site the following averaging zones have been defined:

- **Averaging Zone 1:** Proposed Residential Area (assuming gardens and plant uptake)
- **Averaging Zone 2**: Proposed Commercial Area

Soils from depths of greater than 1.0mbgl have been screened against relevant guidelines to characterise the chemical nature of soils at greater depth.

5.2.4 Soil General Contaminants – Results

Tables 5.1 and 5.2 summarise the results of statistical analysis of chemical data for soils of up to 1.0mbgl for both the mean value test and maximum value test. Full records of the analysis are presented in ***Appendix D.***

Table 5.1: Summary of CLEA Analysis – Averaging Zone 1 (Residential)

Determinand	Mean Value Test UBV	CLEA SGV / ICRCL TTV	UBV Pass / Fail	Maximum Value Test OCV	t Crit Value	OCV Greater / Less than t Crit Value
Arsenic	12.6	20 (1)	✓	1.64	1.91	<
Cadmium	0.6	8 (1)(2)	✓	2.47	1.91	>
Chromium	81.0	130 (1)	✓	2.08	1.91	>
Lead	3321.6	450 (1)	×	2.33	1.91	>
Mercury	0.4	8 (1)	✓	2.47	1.91	>
Copper	111.7	130 (3)	✓	2.02	1.91	>
Nickel	225.1	50 (1)	×	2.23	1.91	>
Zinc	532.4	300 (3)	×	1.91	1.91	<
Selenium	1.0	35 (1)	✓	N/A	N/A	N/A
TPH Screen	1119.1	1000 (4)	×	2.33	1.98	>
Phenol	2.5	5 (5)	✓	N/A	N/A	N/A
Cyanide	2.0	250 (5)	✓	N/A	N/A	N/A
pH	10.1	9.0 (5)	N/A	N/A	N/A	N/A
Sulphate	0.1	1.2g/l (5)	✓	2.05	1.91	>

Notes
(1). CLEA SGV for Residential with Plant Uptake end use.
(2). Cadmium SGV is pH dependent. SGV of 8mg/kg adopted on basis of mean pH of 8.8.
(3). ICRCL TTV for phytotoxic metals (harmful to plants)
(4). WSP Tier 1 Trigger Value based on typical clean up criteria adopted by Environment Agency and trigger value for "Special Waste" or "Controlled Waste" classification.
(5). ICRCL TTV for gardens, allotments and playing fields
(6). All values mg/kg unless stated

Table 5.2: Summary of CLEA Analysis – Averaging Zone 2 (Commercial)

Determinand	Mean Value Test UBV	CLEA SGV / ICRCL TTV	UBV Pass / Fail	Maximum Value Test OCV	t Crit Value	OCV Greater / Less than t Crit Value
Arsenic	12.6	500 (1)	✓	2.38	2.38	>
Cadmium	0.7	1400 (1)	✓	3.66	2.38	>
Chromium	35.0	5000 (1)	✓	1.45	2.38	<
Lead	61.6	750 (1)	✓	2.26	2.38	<
Mercury	0.3	480 (1)	✓	3.08	2.38	>
Copper	91.2	130 (2)	✓	2.70	2.38	>
Nickel	42.9	50 (1)	✓	2.50	2.38	>
Zinc	103.1	300 (2)	✓	2.75	2.38	>
Selenium	1.0	35 (1)	✓	N/A	N/A	N/A
TPH Screen	212.1	1000 (3)	✓	2.16	2.31	<
Phenol	2.5	5 (4)	✓	N/A	N/A	N/A
Cyanide	2.0	250 (4)	✓	N/A	N/A	N/A
pH	7.9	9.0 (4)	N/A	N/A	N/A	N/A
Sulphate	0.8	1.2g/l (4)	✓	4.03	1.91	>

Notes
(1). CLEA SGV for Residential with Plant Uptake end use.
(2). ICRCL TTV for phytotoxic metals (harmful to plants)
(3). WSP Tier 1 Trigger Value based on typical clean up criteria adopted by Environment Agency and trigger value for "Special Waste" or "Controlled Waste" classification.
(4). ICRCL TTV for gardens, allotments and playing fields
(5). All values mg/kg unless stated

5.2.5 Soil General Contaminants - Assessment

Averaging Zone 1: Proposed Residential Area

Generally low concentrations of metals have been identified in shallow soils across Averaging Zone 1. Failures of the mean value test for made ground were identified for the following determinands.

- Lead UBV of 3321.6mg/kg exceeds SGV of 450mg/kg
- Nickel UBV of 225.1mg/kg exceeds SGV of 50mg/kg
- Zinc UBV of 532.4mg/kg exceeds TTV of 300mg/kg
- TPH UBV of 1119.1mg/kg exceeds TTV of 1000mg/kg

The statistical analysis of the data set suggests that failures for lead, nickel, zinc and TPH can be attributed to a 'hot-spot' in TP12 at 0.5mbgl (backfilled pond area) as high concentrations for most contaminants which are not characteristic of the site have been identified in this location:

- Cadmium 0.9mg/kg
- Chromium 169.5mg/kg
- Lead 13650mg/kg
- Copper 203.6mg/kg
- Nickel 566.1mg/kg
- Zinc 1225mg/kg
- TPH by IR 3455mg/kg

The analysis has been run excluding this sample and no failures of UBV's or TTV's have been identified, indicating that this area of the site is suitable for a residential end use with the exception of this area of made ground.

Full records of the CLEA analysis and adjusted analysis (for TP12) are presented in ***Appendix E.*** The extent of the backfilled pond is presented in ***Figure 7.***

Averaging Zone 2: Proposed Commercial Area

Generally low concentrations of metals have been identified in shallow soils across Averaging Zone 2. No failures of the mean value test for shallow soils in the zone have been identified. This indicates that the this area of the site is suitable for a commercial end use and no further consideration is necessary.

Soils from >1.0m Below Ground

Deeper soil samples (BH1 @ 5.4mbgl and BH4 @ 3.7mbgl) have been screened against residential SGV's / TTV's to assess contaminant concentrations in natural soils. No exceedences of relevant guidelines were identified.

5.2.6 Soil Organic Contaminants – General

Site based assessment of organic contamination revealed one occurrence of visible / olfactory evidence of hydrocarbon contamination (slight hydrocarbon odour and staining in WS08 at 2.4-2.6mbgl). However targeted and general coverage based chemical testing was scheduled to characterise the site.

Given the limited compliance data for organic contaminants in UK policy, the following guidance has been adopted to benchmark site data:

- Circular on target values and intervention values for soil remediation (Ministry of Housing, Spatial Planning and the Environment (February 2000) Environmental Quality Objectives in The Netherlands, VROM, The Hague, The Netherlands).

5.2.7 Soil Organic Contaminants - Results

Results for determinands where above the laboratory limits of detection of organic testing are summarised in Table 5.3:

Table 5.3: Summary of Organic Contamination in Soils

Parameter	Range (mg/kg)	Samples above detection Limit	Tier 1 Threshold	Number above Threshold
Organic Screens				
TPH by IR	7 - 3455	35 of 35	1000 (1)	1
TPH by GC-FID				
TPH Petrol Range (C_6-C_{10})	<0.2 to 2.5	1 of 11	800 (2)	0
TPH Diesel Range (C_{11}-C_{25})	<50 to 222.0	1 of 11	NL	N/A
TPH Mineral Oil (C_{26}-C_{40})	<50 to 58.0	1 of 11	5000 (3)	0
SVOC's by GCMS				
PAH by GCMS				
Phenanthrene	<0.3 to 5.3	2 of 33	100 (2)	0

Parameter	Range (mg/kg)	Samples above detection Limit	Tier 1 Threshold	Number above Threshold
Fluoranthene	<0.3 to 6.6	3 of 33	100 (2)	0
Pyrene	<0.3 to 5.3	3 of 33	NL	N/A
benz(a)anthracene	<0.3 to 2.4	1 of 33	50 (2)	0
Chrysene	<0.3 to 2.9	1 of 33	50 (2)	0
benzo(b)fluoranthene	<0.3 to 1.6	1 of 33	NL	N/A
benzo(k)fluoranthene	<0.3 to 2.2	1 of 33	50 (2)	0
benzo(a)pyrene	<0.3 to 2.2	1 of 33	10 (2)	0
Indeno(123-cd)pyrene	<0.3 to 1.4	1 of 33	50 (2)	0
benzo(ghi)perylene	<0.3 to 1.2	1 of 33	100 (2)	0
VOCs by GCMS				
Toluene	<0.2 to 0.8	1 of 11	130 (3)	0
Ethyl benzene	<0.3 to 1.2	2 of 21	50 (3)	0
m,p-Xylenes	<0.0002 to 0.0012	1 of 10	25 (3)	0
o,p-Xylene	<0.2 to 0.0066	1 of 10	25 (3)	0
Xylene	<0.4 to 7.9	1 of 11	25 (3)	0
Isopropylbenzene	<0.8 to 0.0475	1 of 10	NL	N/A
n-Propylbenzene	<0.7 to 0.1327	1 of 10	NL	N/A
1,3,5 Trimethylbenzene	<0.6 to 0.0166	1 of 10	NL	N/A
Tert-butylbenzene	<0.9 to 0.0445	1 of 10	NL	N/A
Sec-Butylbenzene	<1.0 to 0.3282	1 of 10	NL	N/A
n-Butylbenzene	<1.9 to 0.2798	1 of 10	NL	N/A
Naphthalene	<2.6 to 0.6593	1 of 43	NL	N/A

Notes:
(1). WSP Tier 1 Trigger Value based on typical clean up criteria adopted by Environment Agency and trigger value for "Special Waste" or "Controlled Waste" classification.
(2). Dutch (C) Former Intervention Value
(3). Dutch Intervention Value
(4). NL is no level formulated for this determinand to date
(5). All values are mg/kg

5.2.8 Soil Organic Contaminants – Assessment

The results indicate generally low concentrations of organic contaminants in soil across the site area with the exception of one exceedance of its threshold value for TPH (by IR) of 3455mg/kg in TP12. This location correlates with the backfilled pond as discussed in the previous section and appears to be an isolated issue. Associated with this 'hot-spot' are elevated concentrations of PAH.

Other areas of elevated concentrations of organic contaminants comprise:

- Elevated **TPH** (PRO, DRO, MRO, BTEX) and **VOC's** in WS08.
- Elevated **PAH** in WS11 and WS13.

These occurrences correlate with an AST farm for heating oil (APC 3: WS08), the former oil store (APC 10: WS11) and former fuelling post (APC 11: WS13). The contaminant

concentrations in these areas are however not considered significant and are unlikely to represent a constraint to the proposed redevelopment.

5.2.9 Asbestos Screening

Sixteen soil samples from shallow soils across the site were submitted to the laboratory and screened for the presence of asbestos materials. One sample proved positive for chrysotile (asbestos cement product) in BH5 at 0.5mbgl. No asbestos was identified in the backfilled pond area (TP 12) although sheeting was observed within these fill materials.

5.3 Leachable Contamination

5.3.1 General

Six samples of fill material and one sample of natural material (Langley Silt) were tested for leachable contamination. The results, which are summarised in Table 5.4, have been compared against the following guidance to assess their significance:

- the Drinking Water Quality Standards (DWQS)
- the Environment Agency Operation Directive No 4/98 (Interim Guidance on the Disposal of Contaminated Soils).

5.3.2 Leachable Contamination – Results

Results for determinands where above the laboratory limits of detection are summarised in Table 5.4:

Table 5.4: Summary of Leachability Test Data

Parameter	Range (µg/l)	No. above Detection Limit	Tier 1 Threshold		Number above Tier 1 Threshold
			DWQS [1]	EA [2]	
Copper	<5 to 7	5 of 7	3000	20	0
Zinc	<7 to 11	1 of 7	5000	500	0
pH	6.1 to 8.6	N/A	5.5 – 9.5	5.5 – 9.5	0
Sulphate	<20000 to 23000	2 of 7	250000	150000	0
TPH by IR	<100 to 200	4 of 7	10	NL	4
PAH by GC-FID	1.5 to 2.9	7 of 7	0.2	0.2	7

Notes
(1) DWQS is Drinking Water Quality Standards as defined by the Water Supply (Water Quality) Regulations: 1989.
(2) EA is Environment Agency "Interim Guidance on the Disposal of Contaminated Soils" (04/98).
(3) All values are µg/l

5.3.3 Leachable Contamination – Assessment

Based upon the results obtained from the laboratory analysis generally of the inorganic contamination identified is present in an insoluble form and therefore has a low potential mobility. Slightly elevated leachable concentrations of organic contaminants have however

been identified (TPH and PAH). These leachable concentrations are however not considered significant in the context of risk to groundwater given that the site is located on a minor aquifer (Lynch Hill Gravels) and as UK DWQS are conservative for groundwater.

Whilst the leachable concentrations identified are not considered to represent a significant risk to groundwater, there are implications within the context of waste disposal. On the basis of failures of Environment Agency guidance on the disposal of contaminated soils for PAH it is possible that landfill operators may classify made ground as contaminated for disposal purposes.

5.4 Groundwater Contamination

5.4.1 General

The strata underlying the site are classified as a minor aquifer (Lynch Hill Gravels) and a non aquifer (London Clay). No abstractions from the Lynch Hill Gravels exist within 1km of the subject site.

The groundwater results have been compared against the Drinking Water Quality Standards (DWQS) as defined by the Water Supply (Water Quality) Regulations: 1989, which can be used for guidance purposes. These regulations apply to the quality of drinking water supplies and are therefore conservative. Other criteria which has been used to benchmark the site data comprise the World Heath Organisation (WHO) Drinking Water Quality Guidelines.

5.4.2 Groundwater Contamination - Results

Table 5.5: Summary of Groundwater Chemical Data

Parameter	Range (µg/l)	Samples above detection limit	Tier 1 Threshold		Number above Tier 1 Threshold
			DWQS	WHO	
Heavy Metals					
Arsenic	<5 to 17	6 of 10	10	10	6
Selenium	<10 to 11	1 of 10	10	10	1
Phytotoxic Metals					
Copper	<5 to 12	5 of 10	3000	2000	0
Nickel	<5 to 10	5 of 10	50	20	0
Zinc	<5 to 6	1 of 10	5000	3000	0
Water Quality Parameters					
Chemical Oxygen Demand	<10000 to 26000	4 of 10	NL	NL	N/A
Electrical Conductivity	0.54 to 1.09	N/A	1.5 mS/cm	NL	0
pH	6.5 to 7.7	N/A	5.5-9.5	NL	0
Ammoniacal Nitrogen	<50 to 200	4 of 10	500	1500	0
Dissolved Oxygen	4800 to 5300	4 of 4	NL	NL	N/A

Parameter	Range (µg/l)	Samples above detection limit	Tier 1 Threshold		Number above Tier 1 Threshold
			DWQS	WHO	
TPH by GC-FID					
TPH Diesel Range (C_{11}-C_{25})	<100 to 700	1 of 7	10	NL	1
Major Anions					
Sulphate	34000 to 140000	10 of 10	250000	250000	0

Notes
(1). DWQS is Drinking Water Quality Standards as defined by the Water Supply (Water Quality) Regulations: 1989.
(2). WHO is World Health Organisation drinking water quality guidelines.
(3). All values are µg/l

5.4.3 Groundwater Contamination - Assessment

Groundwater results, which are presented in ***Appendix E***, indicate that groundwater quality generally falls within acceptable guideline limits, with marginal exceedances of UK DWQS for arsenic, selenium and TPH (diesel range).

Six exceedances of the UK DWQS of 10µg/l for arsenic were identified with a maximum concentration of 17µg/l. One exceedance of the UK DWQS for selenium of 10µg/l was identified for BH1 at 11µg/l. These exceedances are not considered significant as they are only marginal, and given that drinking water standards are conservative for groundwater.

Concentrations of organic contaminants in groundwater are generally low across the site with an elevated concentration of diesel range TPH in BH7. There is no obvious source for this contamination although it is noted that this area is adjacent to former railway sidings. This concentration is unlikely to represent a significant issue given that the site is located on a minor aquifer (Lynch Hill Gravels).

General water quality indicators such as ammoniacal nitrogen, electrical conductivity, and COD (chemical oxygen demand) indicate a low contaminant loading in groundwater.

5.5 Ground Gas (Landfill Gas)

5.5.1 General

Monitoring of the ground gas regime has been undertaken following the installation of monitoring points during the site investigation. One other borehole from a previous investigation was also monitored – BH15 (all other gas monitoring wells were either damaged or destroyed and unsuitable for further monitoring). The results obtained have been compared with relevant guidance that includes the following:

1. The Building Regulations 1991, Approved Document C, Section 2;
2. Protecting Development From Methane, CIRIA Report 149, 1995;
3. Landfill Gas, Waste Management Paper Number 27;

4. Construction of new buildings on gas-contaminated land, BRE Report, 1991.

The Building Regulations set action levels for both methane and carbon dioxide from which an initial assessment can be made. The action threshold for methane is 1% while for carbon dioxide an initial consideration should be undertaken if gas concentrations exceed 1.5%. Action might be required if carbon dioxide concentrations exceed 5%. If these thresholds are exceeded, reference should be made to specific documentation to determine the nature and extent of the gas control measures required.

Guidance within the CIRIA 149 Report entitled "*Protecting Developments From Methane*", identifies a number of gas regimes based on the gas concentrations recorded during monitoring.

The CIRIA 149 report identifies six gas regimes summarised below.

Table 5.6: Summary of CIRIA 149 Gas Regimes

Gas Regime	Methane (% v/v)	Carbon Dioxide (% v/v)	Flow (metres/sec)
1	<0.1	<1.5	No flow
2	>0.1 – 1	>1.5 – 5	No flow
3	>1 – 5	>5	No flow
4	>5 – 20	<20	<0.01
5	>20	>20	>0.01 - 0.50
6	>20	>20	>0.50

5.5.2 Ground Gas - Results

Gas monitoring has been carried out on two separate occasions since the completion of the site works. The results, which are presented in ***Appendix D*** indicate that ground gases have not been recorded at significant concentrations during the gas-monitoring period. Barometric pressures during the gas-monitoring period ranged from 1004mBars to 1018mBars.

Proposed Residential Area

Results for the proposed residential area (BH2, BH4 and BH5) indicate methane was not detected during the gas-monitoring period.

The maximum carbon dioxide concentration of 0.4% was recorded in BH2 on 14th October 2003. This is below the lower 1.5% threshold (where consideration should be given to the use of gas protection measures) and below the upper 5% threshold where gas protection measures would be required.

Gas flows were generally low. Maximum gas flows were recorded as 1.0l/hr (or 2.7×10^{-7}ms).

Proposed Commercial Area

Results for the proposed commercial area (BH1, BH3, BH6 to BH10 and BH15) indicate methane was not detected during the gas monitoring period.

The maximum carbon dioxide concentration of 0.5% was recorded in BH7 on 7th October 2003. This is below the lower 1.5% threshold (where consideration should be given to the use of gas protection measures) and below the upper 5% threshold where gas protection measures would be required.

Gas flows were generally low. Maximum gas flows were recorded as 1.3l/hr (or 3.6 x 10^{-7}ms).

5.5.3 Ground Gas - Assessment

Based on the above information, the gas conditions at the site fall into CIRIA 149, gas regime 1. The gas regime identified at the site is considered to represent a low risk and therefore gas protection measures are not considered to be necessary. There is no evidence to suggest that the site is impacted by mobile ground gas from the neighbouring landfill site to the south.

Gas protection of residential or commercial properties is not required where gas regime 1 conditions prevail over and above structural ground slab construction techniques.

6.0 RISK ASSESSMENT

6.1 Rationale for Contaminated Land Risk

The presence of contaminated land is generally only of concern if there exists an actual or potentially unacceptable risk. Within the context of current UK Legislation (i.e. Contaminated Land Regulations [England], 2000), the interpretation of a "significant risk" is termed to be one where:

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

- *Pollution of controlled waters is being caused.*

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

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

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

The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the intended use of the site, its characteristics; and its surroundings.

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

The risk assessment focuses on current and future exposure scenarios and has therefore considered a future [residential/commercial/industrial] end use, where appropriate.

6.2 Contamination Sources

Based on the findings of the desk study and site inspection the main potential sources of contamination on the site are considered to be:

Contamination Source	Location	Potential contamination issue
Bulk fuel and chemical use / storage	Numerous	Various fuel oils / spirits stored primarily in bunded above ground tanks.
Former ordnance workshops	Buildings A and Y	Explosives chemicals e.g. nitrobenzene
Sub stations	Various	Leakage of oils possibly containing PCBs.
Former railway sidings areas	West and centre	General issues including heavy metals, phenols, polynuclear aromatic hydrocarbons (PAHs) and various hydrocarbons.
Uneven ground / worked ground / backfilled pond	South west / south east / east	Backfill with potentially contaminated fill materials.

The list above identifies perceived potential sources of contamination. The results of the laboratory analysis undertaken as part of this investigation identified that the following sources of contamination are present on site:

- Backfilled old pond – comprising significantly elevated concentrations of lead, nickel, zinc and selenium and hydrocarbons/PAHs
- Leachable PAH from made ground.

6.3 Pollutant Linkages

Based on the ground and groundwater contamination conditions at the site, it is considered that the following plausible pollutant linkages are applicable and therefore require consideration. The assessment considers risk pre-mitigation for both residential and commercial end uses.

6.3 Pollutant Linkage Assessment

Exposure Pathway	Site Specific Contaminants	Complete for Exposure Phase			Reason for Pathway(s)
		Current	Future Res.	Future C / I	
Affected Surface Soils (GL-1m)					
Exposure in landscaped areas via dermal contact and ingestion.	Lead, nickel, zinc, TPH	✓	✓	✗	'Hot-spot' in backfilled pond area for proposed residential end use – no other issues.
Outdoor exposure via inhalation of contaminated dust particulate.	Lead, nickel, zinc, TPH	✓	✓	✗	'Hot-spot' in backfilled pond area for proposed residential end use – no other issues.
Indoor exposure via enclosed space accumulation of volatile vapours.	VOC's and SVOC's (PAH)	✗	✗	✗	No significant concentrations of VOC's or SVOC's (PAH) identified in site soils
Exposure via direct contact.	Lead, nickel, zinc, TPH	✓	✓	✗	Slight risk for current user from surface soils
Affected Subsurface Soils (Below 1m)					
Exposure of site occupants via consumption of home-grown produce and direct contact (through gardening etc.)	Lead, nickel, zinc, TPH	✗	✓	✗	Backfilled pond extends to 1.5mbgl in residential area only, potential for plant uptake exists
Outdoor exposure via inhalation of contaminated dust particulate.	Lead, nickel, zinc, TPH	✗	✗	✗	No likely exposure scenarios have been identified for the main area of concern – backfilled pond
Indoor exposure via enclosed space accumulation of volatile vapours.	VOC's, SVOC's (PAH)	✗	✗	✗	Relatively low concentrations of PAH in soils – very limited potential for volatilisation from depth
Exposure via direct contact.	N/A	✗	✗	✗	No likely exposure scenarios have been identified for the main area of concern – backfilled pond
Leaching of contaminants from fill materials.	TPH, PAH	✓	✓	✓	Slight hypothetical risk from marginally elevated leachable contaminants but site is located on minor-aquifer
Leaching of contamination into drainage system.	TPH, PAH	✓	✓	✓	New utilities may be at low risk from slightly elevated concentrations
Accumulation of methane gas in enclosed spaces / sub-floor voids at potentially explosive levels / elevated asphyxiate – carbon dioxide	Ground Gas	✗	✗	✗	Ground gas concentrations should not require protection measures
Affected Groundwater					
Potable water ingestion.	Arsenic, selenium, TPH (DRO)	✗	✗	✗	Low concentrations of contaminants, no potable abstractions within site zone of influence
Migration on to third party land (Statutory Nuisance).	Arsenic, selenium, TPH (DRO))	✗	✗	✗	Low concentrations of contaminants, site is located on low permeability non-aquifer
Impact on nearby groundwater abstraction (non-potable).	Arsenic, selenium, TPH (DRO)	✗	✗	✗	Low concentrations of contaminants, one non-potable abstraction from Upper Chalk only
Vapour inhalation from dissolved and free phase contamination.	VOC's, SVOC's (PAH)	✗	✗	✗	No significant concentrations identified
Contamination of surface waters.	Nickel, TPH (DRO)	✗	✗	✗	Low concentrations of contaminants, nearest receptor is 600m north east

7.0 ENVIRONMENTAL RISK MITIGATION AND MANAGEMENT

The following risk management measures are recommended to deal with environmental risks associated with the identified ground and groundwater contamination in the context of current use and the proposed redevelopment of the site for residential and commercial end uses.

7.1 Protection for Current User

One potential risk area has been identified at the backfilled pond location. Risks are however considered low given that the area is grassed and therefore not used recreationally. Additionally the site is secure from the general public. The overall risks are considered to be low provided soils are not disturbed.

7.2 Construction / Maintenance Workers

Construction workers or maintenance staff involved in excavation at the site will be exposed to concentrations of lead, nickel, zinc and TPH in soils that are likely to present a significant risk to human health. It will be necessary to ensure that construction workers are adequately protected and that a suitable health and safety management scheme is operated during construction activities. These measures should include the following:

PPE to be worn:

- Nitrile gauntlet type gloves to be worn.
- Disposable overalls to be worn.
- Disposable masks with a PS2 filter to be worn where dusty working conditions are encountered.

General Site Practices:

- Provide on-site washing facilities.
- Wash hands at the end of every work period (including forearms, face etc. if become dirty) and before eating, smoking etc.
- Respect the no eating on site rule and confine smoking to areas away from the work site, and only smoke after decontamination.
- Report any ill health.

7.3 Protection of Groundwater

It has been identified that site activities have generally not impacted upon groundwater quality. Elevated TPH has been identified in one borehole (BH7) only and is not considered to

represent a site wide issue. No protection of groundwater is considered necessary for the following reasons:

- Contaminant concentrations are low in soil, leachate and groundwater.
- The site is located on a minor aquifer (Lynch Hill Gravels).
- There are no potable abstractions in the vicinity utilising water from the superficial deposits.

7.4 Protection of Surface Water

Given the distance to the nearest surface watercourse on the basis of groundwater flow direction and low concentration of contaminants in soil and groundwater the site is considered to represent a low risk to surface water.

7.5 Protection of Future End User

Residential

It will be necessary to prevent future occupants of the site residential area from coming into contact with contamination identified in the backfilled pond area by breaking the pollution linkage. This will prevent direct contact, ingestion or inhalation of contaminants. The averaging area indicates that the site is otherwise suitable for end use.

Commercial / Industrial

No contamination issues have been identified in the proposed commercial area and it is therefore considered suitable for end use without further mitigation.

8.0 ENGINEERING ASSESSMENT

8.1 General

A preliminary geotechnical investigation was included in the scope of works to determine the likely ground conditions and geotechnical issues related to the proposed development.

The proposed development comprises the construction of five main structures for industrial/warehouse purposes (12.04 Ha) with associated service yards and an area of flats/houses situated to the east and south east of the site (5.08 Ha).

Associated car parking spaces will amount to a total of 352 spaces above ground and 108 spaces below ground. Access roads to the main structures will also be constructed.

8.2 Geotechnical Hazards

The following potential geotechnical hazards have been identified at the site. These hazards will represent a constraint to development.

Hazard	***Comment***
Made Ground	*Variable in both nature and its potential for settlement. The made ground at the site is thought to be associated with infilled areas, particularly in the south of the site, and does not represent blanket coverage across the site. Domestic refuse is believed to be present towards in the vicinity of the proposed new access roundabout on the A408 to the south west.*
Superficial deposits	*Possibly susceptible to high settlement under load.*
Shallow groundwater	*Groundwater ingress may be a problem for the construction of deep services or basement car parking.*
Swelling/Shrinkage	*Some soils at the site are recorded as having high plasticity with a high potential for swelling and shrinkage.*
Old foundations and obstructions	*The site previously has been developed and former foundation and obstructions should be anticipated.*

8.3 Site Preparation Works

Demolition of existing buildings, removal of made ground in the areas where foundations are to be installed and removal of existing foundations when required are the main preparation works required for the site.

A suitably experienced demolition contractor should be employed for the removal of the existing buildings. Adequate mapping of existing foundations should be completed and any

unexcavated foundations should be recorded for any further redevelopment of the area. It will be necessary to backfill voids with a granular fill compacted to a suitable specification.

Any removal off site of made ground may be kept to a minimum by stockpiling the material on site and reusing it for landscaping subject to adequate assessment of contamination.

8.4 Building Foundations

Table 8.1 summarises types of foundations and briefly discusses the generic suitability of each foundation type to carry reasonable loads in the existing ground conditions.

Table 8.1: Summary of Foundation Solutions

Foundation Type	Suitability
Strip and pad foundations	Considered suitable in areas where differential settlement is not expected (natural ground, Langley Silt or Lynch Hill Gravels) and low bearing pressures are designed.
Raft foundations	Possibly suitable providing that variable made ground is removed and foundations are based on natural ground (Langley Silt or Lynch Hill Gravels) or suitable reengineered ground at low to intermediate bearing pressures.
Vibro improvement	Suitable in the areas of deep made ground. Either stone columns or concrete columns will be suitable, though stone columns are likely to be more economic.
Bored piles	Bored piles are considered a possible option for the site to carry medium to high loads for the proposed multi-storey buildings. The presence of groundwater within the granular materials may give some construction problems associated with the collapse of granular materials in saturated conditions when boring (Lynch Hill gravels).
Continuous flight auger piles (CFA	The pile auger supports the bored sides during construction without the need for temporary casing or bentonite. These piles will reduce the likelihood of collapse and difficulties of construction of the bored piles in saturated granular ground.
Driven Pile (Cast in place or pre-cast)	Ideally suited for granular soils below the water table. Maximises the use of available skin friction and end bearing potential in granular materials. The drivability of the piles should be checked with a specialist piling contractor based on the data provided by this report. Vibration associated with installation can be an issue in sensitive areas.

Due to the considerable presence of made ground and Langley Silt at the site, it is likely that a selection of different foundations types will be appropriate dependent on the structural loadings to be imposed.

Spread Foundations

General

The made ground and the Langley Silt are unlikely to be suitable as founding stratums. Foundations will need to be taken to the firm Langley Silt or to the Lynch Hill Gravel. Further delineation of the areas of shallow foundations will be required. Deeper excavations will be required where made ground or Langley Silt is of greater thickness. Where greater than 2.0m in depth it is likely that excavations will encounter ground water and it may be more economic to adopt vibro improvement beneath structures.

Strip Footing

For the purpose of bearing capacity and settlement assessments, a depth of shallow foundations of 1m below ground level has been considered. On the basis of the ground and groundwater conditions identified in the exploratory holes, it is considered that a reinforced strip footing founded in firm Langley Silt or medium dense gravel will be suitable at the site. Subject to further classification across the site it is likely that the presumed bearing pressure will be in the order of 90kN/m^2. Potential differential settlement could occur between different footings. If strengths of less than firm are encountered when digging for these foundations, the bearing capacity quoted in this report will need to be revised. Further assessment of the bearing stratum across the site is required.

Pad Footing

It is considered that pad footings may be utilised in concentrated loading conditions. A pad footing founded in the firm clay comprising the Langley Silt or medium dense gravel at a depth of 1.0m would operate at an allowable bearing capacity in the order of 100kN/m^2. Further assessment of the bearing stratum across the site is required.

Raft Foundation

It is anticipated that a reinforced semi-raft foundation can be utilised if founded within the firm clay comprising the Langley Silt or the dense Lynch Hill gravels. A raft footing founded within this stratum would operate at an approximate allowable bearing capacity of 50kN/m^2 in firm clay. Further assessment of the bearing capacity of the ground for the case of raft foundations will be required.

For all shallow foundations, it is recommended that a suitably qualified engineer inspect the excavations prior to the casting of the foundation. It is also recommended that should any soft spots or made ground be encountered at the proposed foundation depth, they be removed and replaced with appropriately compacted granular engineered fill material or lean mix concrete, or the excavation be extended to a more competent horizon.

The London Clay at the site is recorded as having high plasticity. The Langley Silt commonly also has high plasticity. There is a possibility that the shallow soils may be prone to swelling and shrinkage, particularly in close proximity to large trees. Further assessment of the plasticity of the clays at the site is recommended.

Vibro Improvement

Vibro stone columns or concrete columns may be suitable at the site where the made ground is present in thick deposits. However the presence of timber, metal and concrete in the material at the former pond area may preclude the use of stone columns in this part of the site.

The columns densify the ground and provide a more solid support platform upon which reinforced strip foundations can then be constructed. A suspended slab is likely to be required wherever vibro improvement is adopted.

The advice of a specialist contractor should be sought on the suitability of the fill materials for their proprietary techniques.

Pile Foundations

Should deep foundations be required for higher loading conditions, it is recommended that further geotechnical advice be sought prior to final detailed design.

However, for the purpose of preliminary design of deep foundations, it is considered that some form of bored pile or CFA piling is likely to be the most suitable pile type for the site, although this comment does not preclude consideration being given to the use of other pile types provided that environmental issues are addressed in the selection. The Local Authority should be consulted in regard to the potential issue of noise and vibration in the area, which may determine whether driven piles are suitable at the site.

Given the thickness of made ground and superficial deposits present, if it is considered that groundwater may cause significant ingress, continuous flight auger piles or continuous helical displacement piles are likely to be the most suitable bored pile type due to the presence of Lynch Hill Gravel.

Based on the limited geotechnical information for the site, preliminary assessment of the safe working loads of 300, 450 and 600mm diameter CFA piles designed to a factor of safety of 3.0 are given in the Table 8.2 The concrete stress in the pile shaft has not been checked.

Table 8.2: Summary of preliminary pile capacities

Pile Penetration mbgl	Safe Working Load kN 300mm dia	Safe Working Load kN 450mm dia	Safe Working Load kN 600mm dia
6	50	100	150
8	75	125	200
9	100	150	225

* Ground conditions assume firm clay to 2.0m bgl, dense gravel to 5m bgl and stiff clay to base of pile, 1m deep pile cap.

The above loads should only be treated as estimates of likely pile performance and have been based on estimated soil parameters. No account is made for negative skin friction or pile group performance.

Although no below ground obstructions (such as ground slabs) from the former site use were found in the boreholes, they should be anticipated. Provision should be made for installing additional piles to miss these obstructions.

Consideration will need to be given to the arisings from the boreholes and whether it is classed as contaminated and suitable for re-use on the site.

8.5 Services

Adequate allowance for potential settlements when installed in existing made ground should be mad e.

8.6 Earthworks – Excavations

In addition to the recommended removal of made ground in the area of the proposed foundations and the required remediation of contaminated ground, no significant excavations are anticipated unless underground car parks and basements are to be constructed. Specialist advice should be sought in this case with regards to adequate containment of deep excavations and provision of acceptable factors of safety for slopes of significant angles or height.

Excavations are likely to encounter groundwater ingress if they exceed 2m approximately or if Lynch Hill Gravels are exposed. The consequences associated with the rising of groundwater in permeable layers (Lynch Hill Gravel) can lead to significant pressures applied on basements and the need of dewatering to carry out deep excavations. Fine sand and silt strata may be prone to running sand conditions wherever shallow groundwater is encountered in open excavations.

8.7 Earthworks – Fill

Excavated ground will likely comprise made ground (see environmental sections for recommendations of remediation and reuse), Langley silt and Lynch Hill gravels if the depth of the excavation does not exceed approximately 5m.

The made ground generally comprises reworked natural deposits and should be suitable for re-use. The exception to this is the material in the former pond area which has timber, metal and bricks in it and will be unsuitable as engineered fill. Natural ground could be used as

engineered fill subject to adequate sampling and testing during the earthworks operations. When used as engineered fill, it is recommended that any re-use of materials follows the specifications for highway works contained in the Highways design manual, series 600, "Earthworks".

Subject to adequate testing and treatment, excavated material from Lynch Hill Gravel is likely to fulfil the requirements for Class 1A materials in accordance to Highway specifications and excavated material from the Langley Silt may satisfy the requirements for Class 2 material. Further testing and classification of the soils will be required.

The material is likely to be susceptible to wetting upon exposure to rain and protection of earthworks and excavations will be required depending on the weather conditions.

8.8 Pavement Design

CBR values have been discussed in a previous section of this document. It is anticipated that road pavements and car park areas will be constructed on the made ground or superficial deposits (Langley silt and Lynch Hill gravels). CBR testing has been carried out on the soils to determine an acceptable design value. The majority of the results gave CBR values between 5% and 15%. Care will be required in the design of pavements over extensive deposits of made ground or soft soil because of the potential for differential settlement. The following options may be suitable at the site:

- Replacement/removal of subgrade.
- Improvement with lime treatment.
- Excavation and recompaction.
- Use of geogrids to improve the performance of the subgrade.

It is likely that long term maintenance will be required of pavement constructed over thick made ground deposits.

Crushed masonry/concrete from the existing buildings may be used as sub base material subject to appropriate testing, selection and compaction methods. Guidance on the use of these materials can be found in CIRIA report 513 "Reclaimed and recycled constructions materials handbook".

9.0 REDEVELOPMENT CONSIDERATIONS AND RECOMMENDATIONS

9.1 Introduction

To facilitate redevelopment of the site for residential and commercial end uses, it will be necessary to overcome a number of geotechnical and environmental constraints identified during this investigation. These issues should be dealt with in a systematic manner, as detailed in the subsequent sections, to ensure that the potential land use is maximised and abnormal redevelopment costs are effectively controlled.

9.2 Existing Buildings and Facilities

Existing buildings including the two main ordnance production buildings, satellite buildings (offices, garages, fire station, sheds), air raid shelters (known to be above ground only), plus backfilled water tanks and relic railway lines will require demolition / removal.

It is understood that an up to date asbestos register is held for the site and materials appropriately denoted on site, however there is potential for encountering further asbestos materials and asbestos materials will have to be removed by licensed contractor.

Areas of fuel storage including the heating oil AST's and UST will require decommissioning and subsequent validation that hydrocarbon contamination is not present beneath these structures.

9.3 Ground Contamination

General Site Conditions

The investigation has confirmed that general contamination concentrations across the site are low with no significant restriction to future commercial or residential development of the site. The following items have been identified that will require further consideration or mitigation as part of the development:

Backfilled Pond

The backfilled pond in the north eastern section of the site contains waste materials contaminated with metals, asbestos and organic materials (hydrocarbons and PAHs). As part of the proposed residential development of this area of the site it will be necessary to excavate and remove these materials to a suitable waste disposal facility.

On-site treatment is not considered to be feasible given the nature of the materials and the nature of contamination encountered.

Hydrocarbons

Slightly elevated concentrations of hydrocarbons have been identified in soils in the vicinity of the heating oil AST's in the north west of the site and it is considered that there is a potential for further organic contamination beneath the bunded tank area. This will require confirmation post decommissioning of the tanks by excavation of surface soils and subsequent validation.

Further investigation of the area of "oily material" identified in buried services by Gibb Environmental has been inconclusive and there is a slight risk of encountering these materials during decommissioning. Contaminated infrastructures should be appropriately disposed of and underlying soils validated as uncontaminated.

It is considered that there is potential for further limited hydrocarbon hotspots across the site due to the storage of fuels and oils at various locations on the site. A suitable contingency should be identified for investigation, delineation and remediation of hotspots if encountered.

Where encountered it will be necessary to consider the future end use prior to establishing whether the contamination requires removal or not.

9.4 Foundations

The choice of foundation will likely be based on economic and loading requirements. Section 8.4 provides a detailed account of the loading capacities and possible complications and advantages associated with each type of foundation.

9.5 Services

Existing services will require decommissioning including gas, water, electricity, drainage and telecommunications. In addition five electrical sub stations on site will have to be decommissioned where not retained as part of the new development.

Although contamination concentrations across the site are generally low, new services should be laid in trenches backfilled with clean granular fill to mitigate risk to future construction and maintenance workers of exposure to any elevated concentrations of inorganic or organic contaminants in made ground.

Advice should be sought from the local water undertaker to establish preferred materials for installations. Provided any contamination 'hot-spots' are recovered HDPE water pipes should be adequate.

9.6 Waste Disposal of Soils

Soils of the made ground are relatively inert although local elevations of some metals have been identified together with marginal elevations of concentrations of hydrocarbon contamination. Based on the Environment Agency document *"Guidance on the Disposal of Contaminated Soils"*, and concentrations of contaminants in made ground (i.e. leachable concentrations of PAH) it is considered that there is a slight possibility that general fill materials on site maybe classified as contaminated. This should be confirmed through discussions with nearby landfill operators.

The materials in the backfilled pond should be treated as contaminated and an appropriate classification should be sought from a nearby landfill operator.

9.7 Proposed Roundabout Area

Initial enquiries have identified that the area of the proposed new roundabout was previously underlain by domestic waste associated with historical land filling. It is anticipated that significant earthworks may be required as part of the scheme and the following actions are recommended:

- Enquiries with controlling body of the local road network relating to the construction design of the A408 in the area of the proposed roundabout and approach to dealing with domestic waste.
- A ground investigation is undertaken to determine extent of landfill and geotechnical properties of founding strata and associated foundation requirements.
- An assessment of contamination characteristics of any materials which are likely to constitute waste as part of earth works and likely classification / costs for waste disposal purposes is undertaken.

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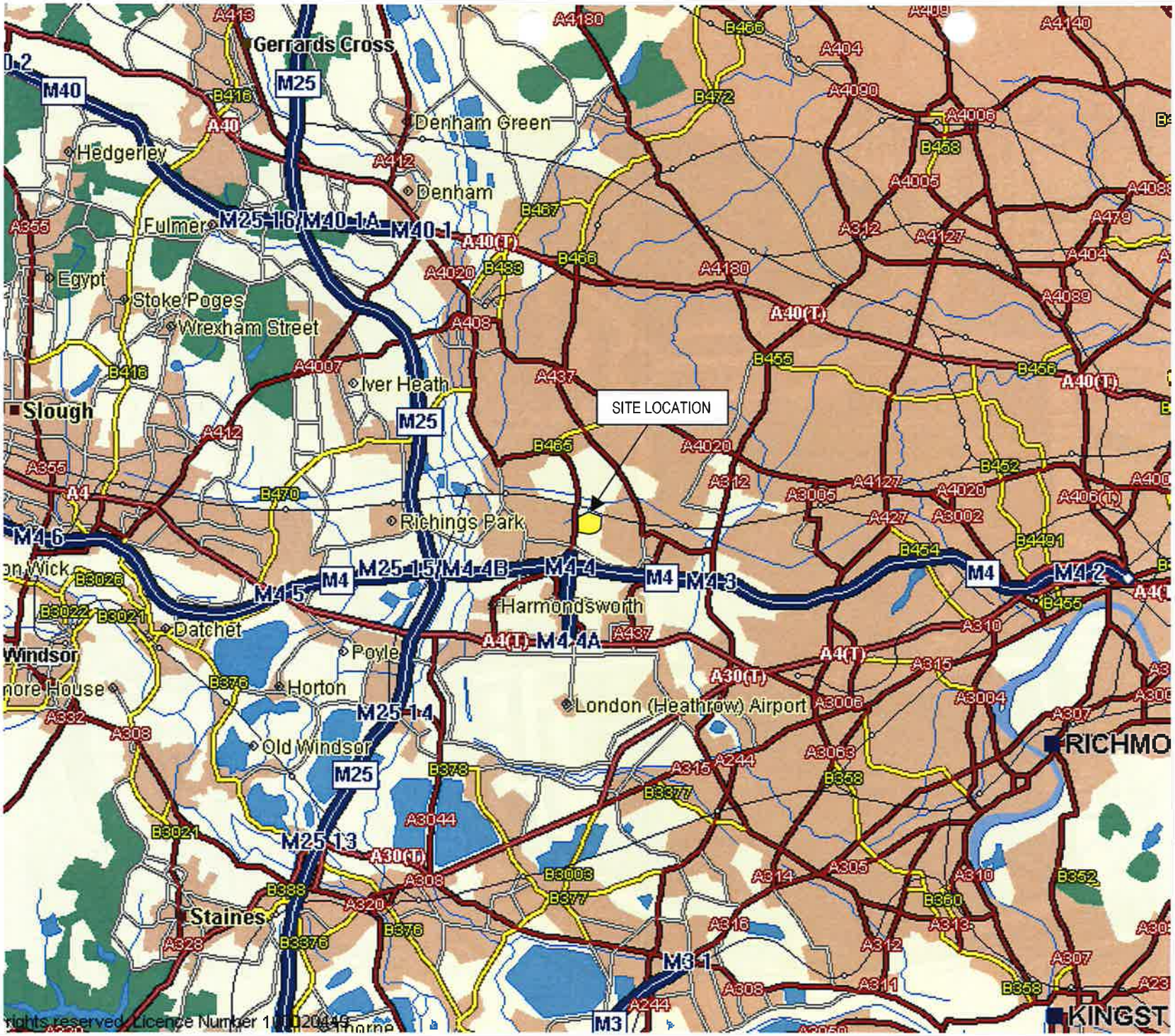
Figures



DO NOT SCALE

NOTES:

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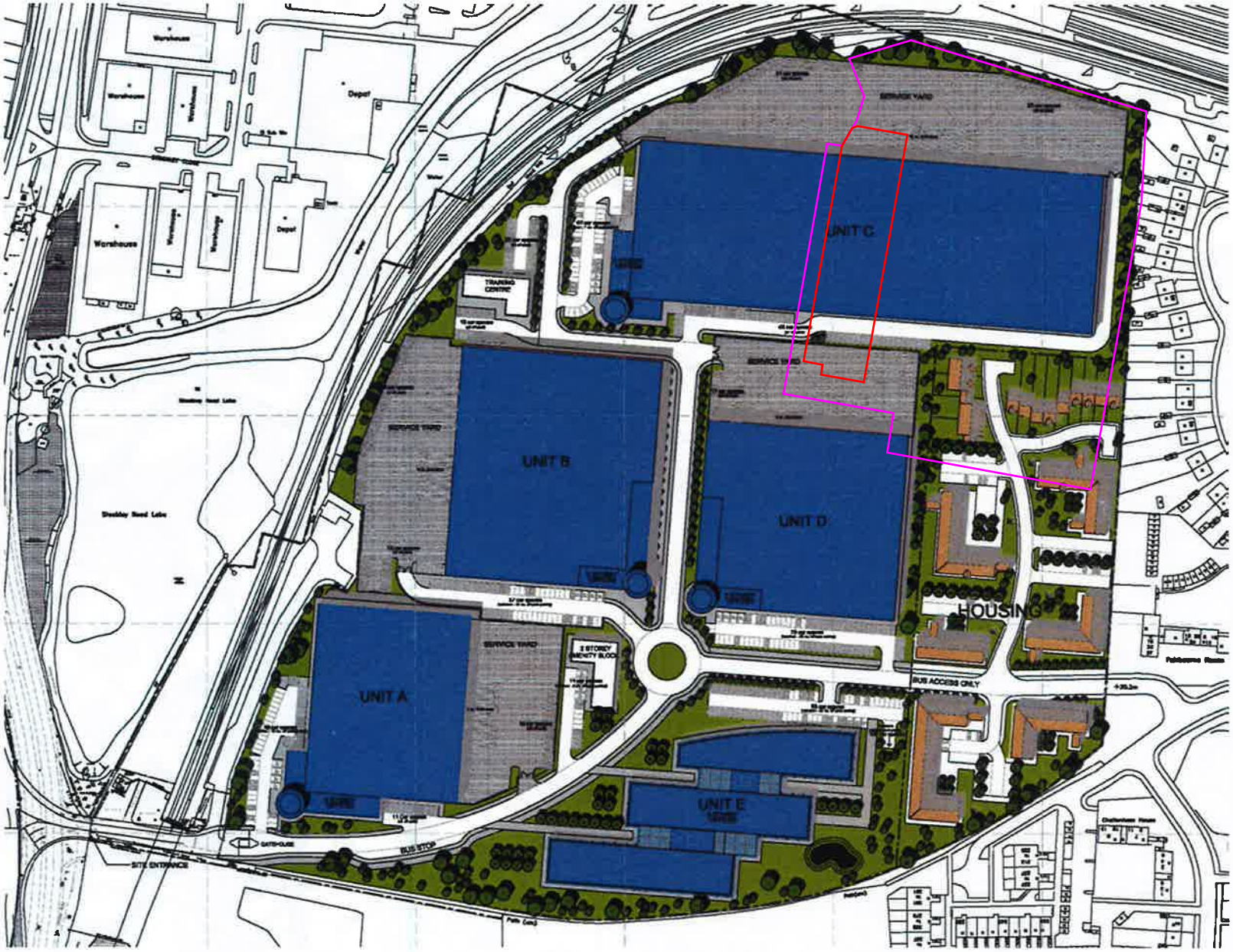
http:// www.wspgroup.com

CLIENT: ProLogis® The Global Distribution Solution

PROJECT: MOD RECORDS OFFICE, HAYES PHASE II GEO-ENVIRONMENTAL ASSESSMENT

TITLE: SITE LOCATION PLAN

SCALE@SIZE:	ISSUE:
NTS	FINAL
DESIGN/DRAWN:	DATE:
TD	NOVEMBER 2003
PROJECT No:	DRAWING No:
12170423/002	FIGURE 01



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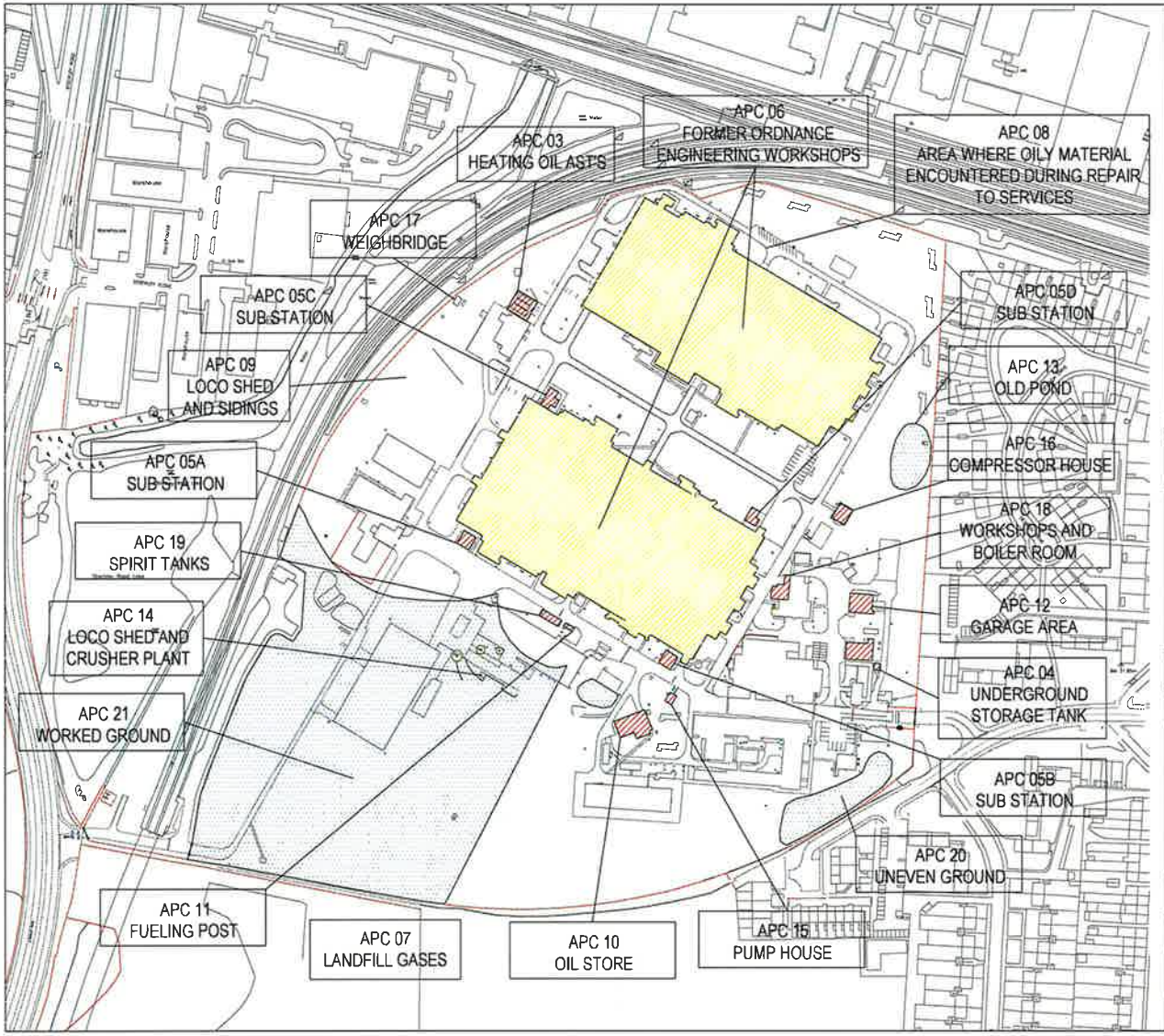
http:// www.wspgroup.com

CLIENT: ProLogis® The Global Distribution Solution

PROJECT: MOD RECORDS OFFICE, HAYES PHASE II GEO-ENVIRONMENTAL ASSESSMENT

TITLE: PLAN OF PROPOSED DEVELOPMENT

SCALE@SIZE:	ISSUE:
NTS	FINAL
DESIGN/DRAWN:	DATE:
CF	NOVEMBER 2003
PROJECT No:	DRAWING No:
12170423	FIGURE 02



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FUEL / CHEMICAL STORAGE AND USE OF HYDROCARBONS

BUILDING HISTORICALLY ASSOCIATED WITH ORDNANCE PRODUCTION

WORKED GROUND / UNEVEN GROUND OR BACKFILLED AREAS

APC01 / 02 RELATE TO ASBESTOS MATERIALS

APC07 RELATES TO LANDFILL GASES - OFF SITE

APC01: 08 BASED ON GIBB ENVIRONMENTAL INVESTIGATION 1998

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: FINAL

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CLIENT: ProLogis

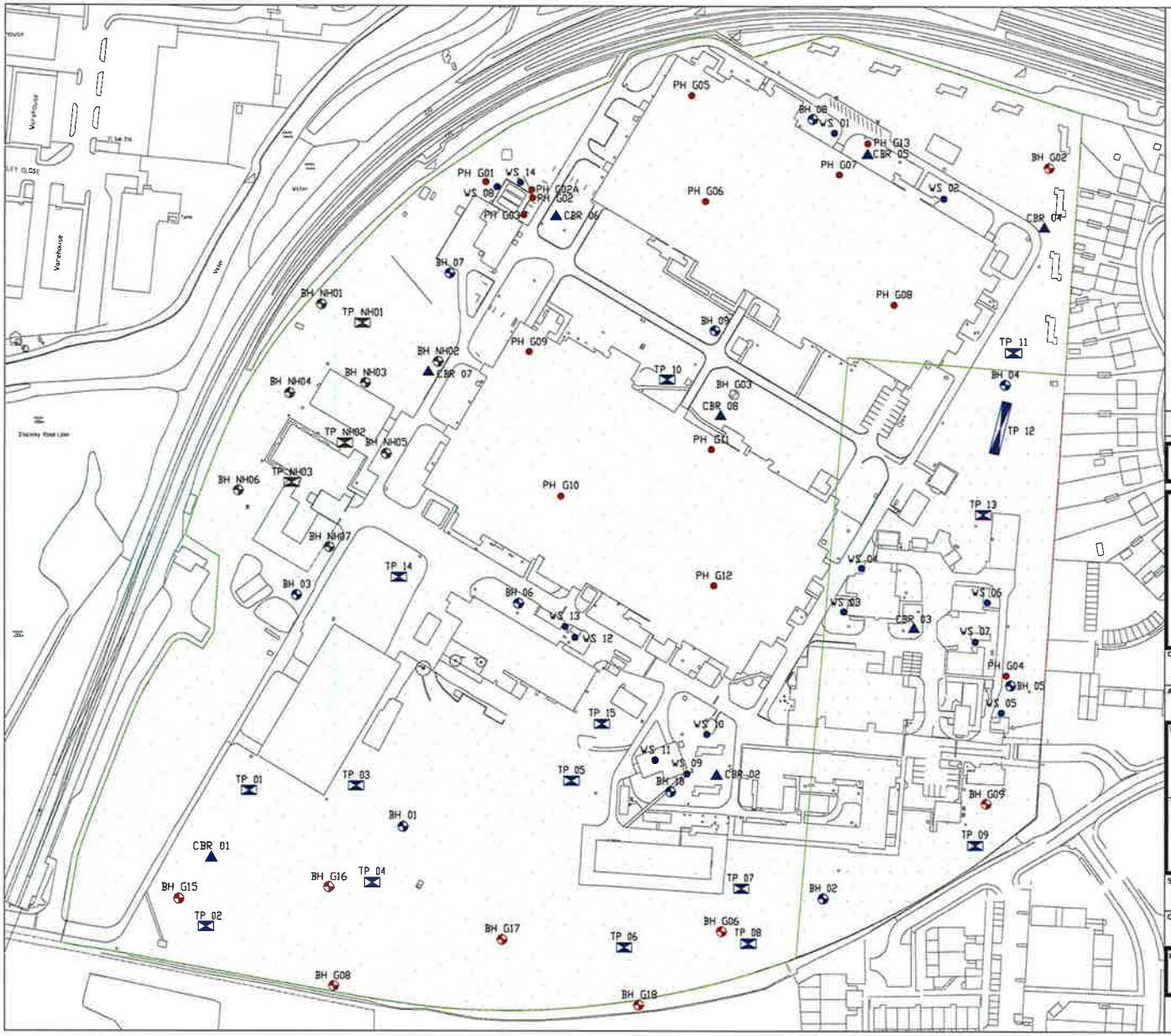
ARCHITECT: N/A

PROJECT: MOD RECORDS OFFICE, HAYES
PHASE II GEOENVIRONMENTAL ASSESSMENT

TITLE: PLAN OF CURRENT SITE LAYOUT AND AREAS OF POTENTIAL CONCERN (APC'S)

SCALE@SIZE:	CHECKED:	APPROVED:
NTS	RC	RC
CAD FILE:	DESIGN/DRAWN:	DATE:
	TD	NOVEMBER 2003

PROJECT No:	DRAWING No:	REV:
121702423	FIGURE 03	



DO NOT SCALE

- WSP BOREHOLE
- WSP TRIAL PIT
- WSP WINDOW SAMPLE HOLE
- WSP CBR TEST LOCATION
- GIBB ENVIRONMENTAL BOREHOLE
- GIBB ENVIRONMENTAL WINDOW SAMPLE HOLE
- NORWEST HOLST BOREHOLE
- NORWEST HOLST TRIAL PIT
- AVERAGING AREA 1 - PROPOSED RESIDENTIAL
- AVERAGING AREA 2 - PROPOSED COMMERCIAL

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: FINAL

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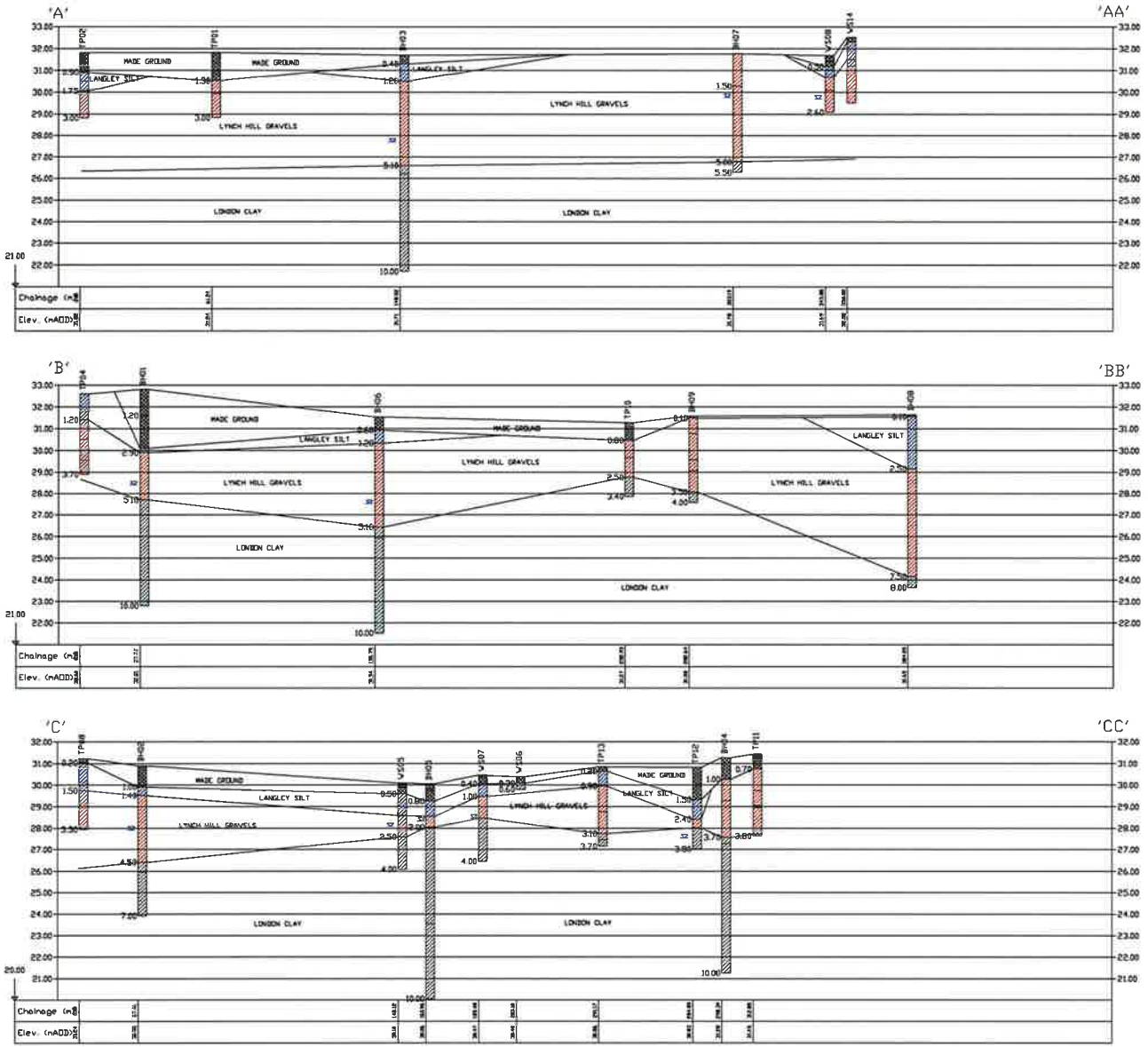
ARCHITECT: MICHAEL SPARKS ASSOCIATES

PROJECT: MOD RECORDS OFFICE, HAYES
PHASE II GEO-ENVIRONMENTAL ASSESSMENT

TITLE: EXPLORATORY HOLE LOCATION PLAN AND CLEA AVERAGING ZONES

SCALE@SIZE:	CHECKED:	APPROVED:
NTS	RC	RC
CAD FILE:	DESIGN/DRAWN:	DATE:
	TD	NOVEMBER 2003

PROJECT No:	DRAWING No:	REV:
12170423	FIGURE 04	N/A



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MADE GROUND

LANGLEY SILT (BRICKEARTH)

LYNCH HILL GRAVEL

LONDON CLAY

APPROXIMATE CROSS SECTION TRANSECTS

NO.	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: FINAL

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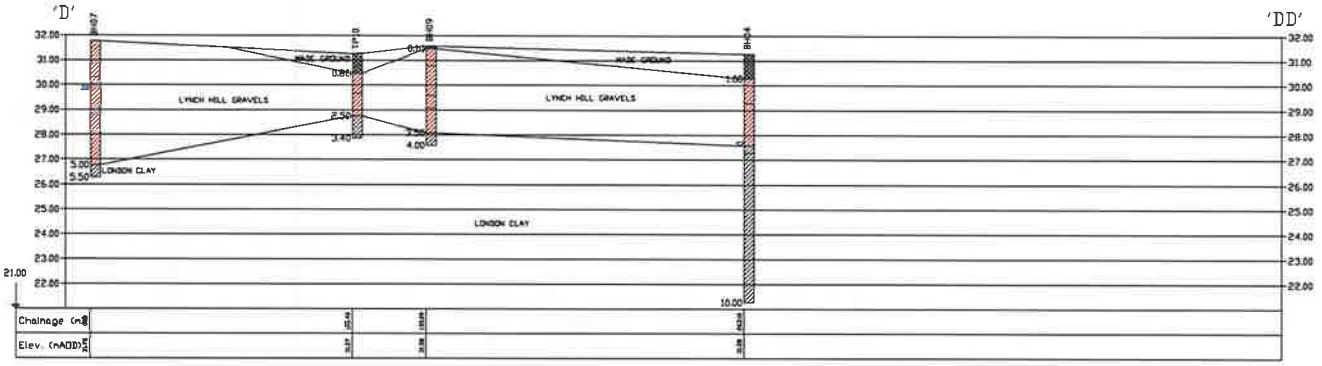
CLIENT: MDA ProLogis

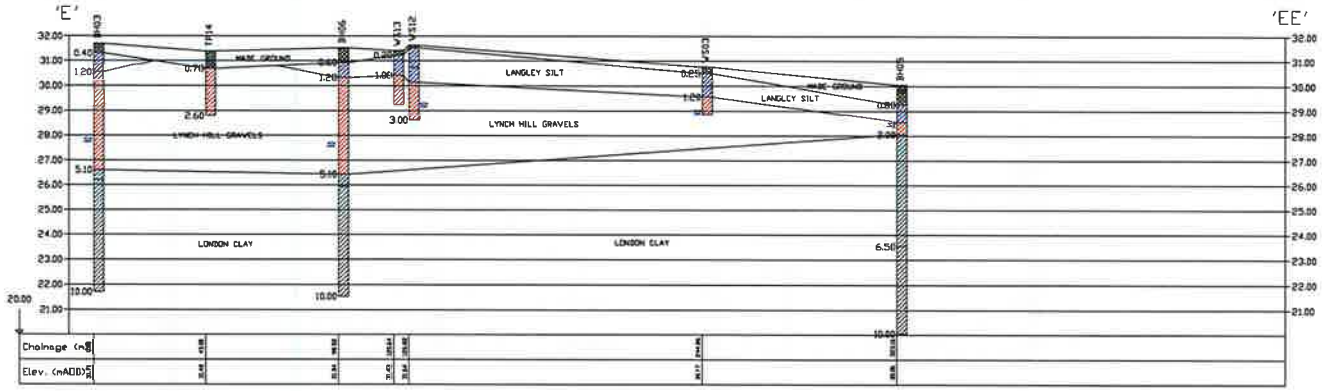
ADDRESS: MICHAEL SPARKS ASSOCIATES

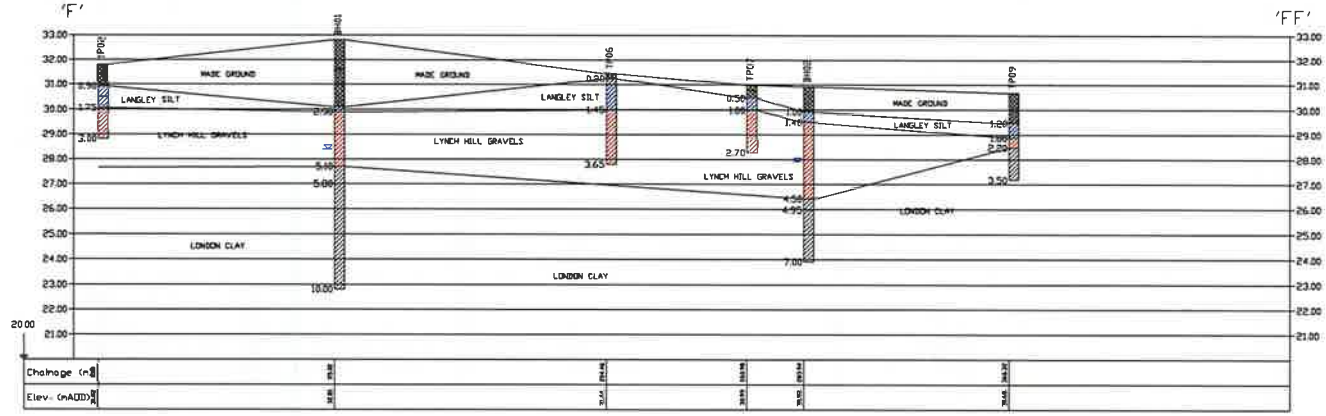
PROJECT: MOD RECORDS OFFICE, HAYES, MIDDLESEX
PHASE II GEO-ENVIRONMENTAL ASSESSMENT

TITLE: GEOLOGICAL CROSS SECTIONS FOR SOUTH TO NORTH ORIENTATION BASED ON EXLORATORY HOLE RECORDS

ORIGINATOR	CHECKED	APPROVED
SEE NOTES	RC	RC
DRAWN	DESIGNED	DATE
	TD	NOVEMBER 2003
PROJECT No.	DRAWING No.	REV.
12170423	FIGURE 05	







DO NOT SCALE

MADE GROUND

LANGLEY SILT (BRICKEARTH)

LYNCH HILL GRAVEL

LONDON CLAY

APPROXIMATE CROSS SECTION TRANSECTS

NTS	DATE	BY	DESCRIPTION	CHK	APD

FINAL

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ProLogis

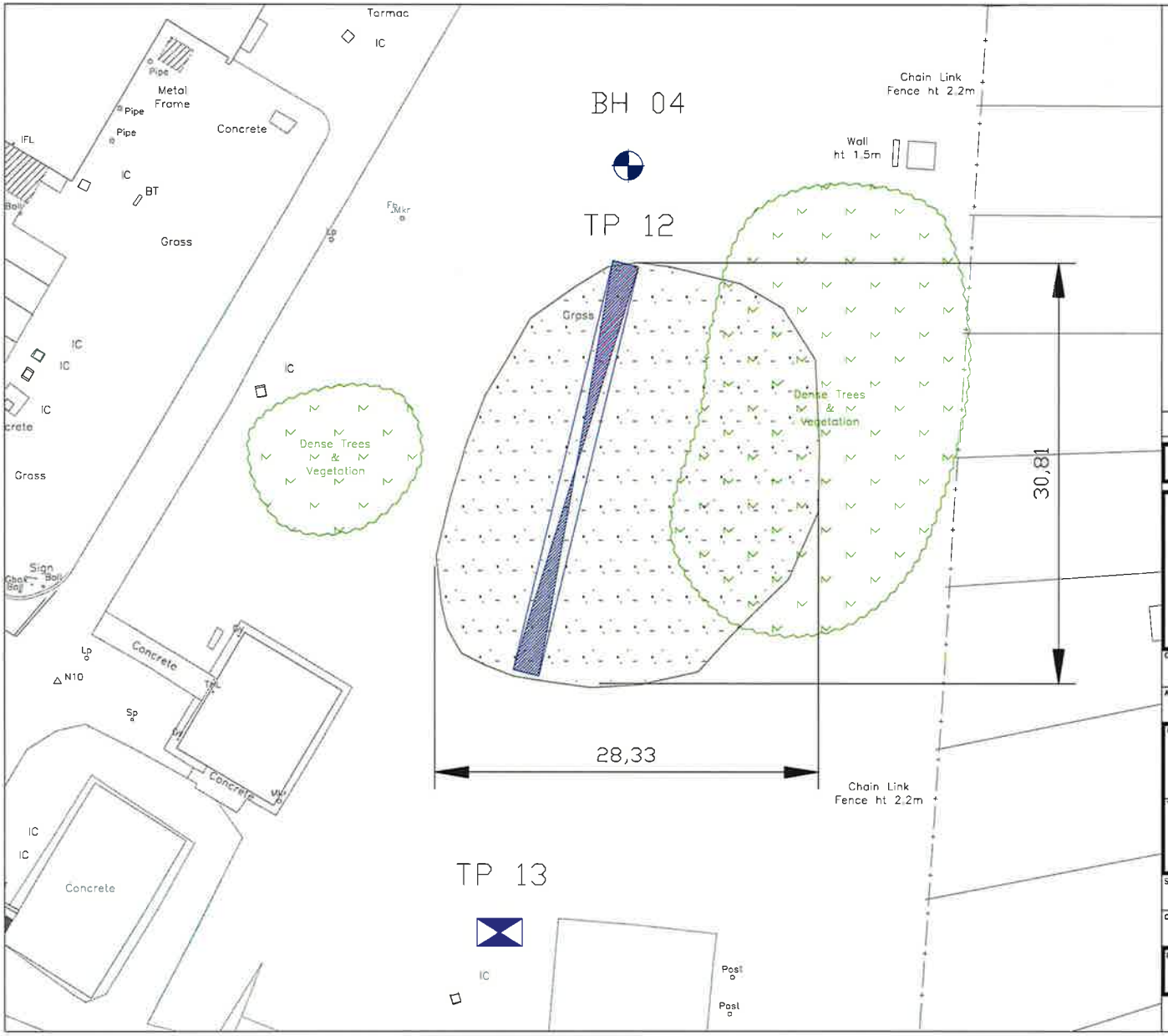
MICHAEL SPARKS ASSOCIATES

MOD RECORDS OFFICE, HAYES, MIDDLESEX
PHASE II GEO-ENVIRONMENTAL ASSESSMENT

GEOLOGICAL CROSS SECTIONS FOR WEST TO EAST ORIENTATION BASED ON EXLORATORY HOLE RECORDS

NTS	RC	RC
	TD	NOVEMBER 2003

PROJECT No.	DRAWING No.	REV.
12170423	FIGURE 06	



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REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: FINAL

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CLIENT: ProLogis

ARCHITECT: MICHAEL SPARKS ASSOCIATES

PROJECT: MOD RECORDS OFFICE, HAYES
PHASE II GEO-ENVIRONMENTAL ASSESSMENT

TITLE: PLAN OF EXTENTS OF BACKFILLED POND AREA

SCALE@SIZE:	CHECKED:	APPROVED:
NTS	RC	RC
CAD FILE:	DESIGN/DRAWN:	DATE:
	TD	NOVEMBER 2003

PROJECT No:	DRAWING No:	REV:
12170423	FIGURE 07	N/A

Appendix A

Selected Gibb Environmental Data

PH1

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH1

U:\PROJECTS\DEO\BOURNS\PH1 PI.3 KMT-7 9-30-98

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	MADE GROUND: Medium Brown clayey sand containing many rootlets and stones.						G.L
	0.20	MADE GROUND: Firm chocolate brown silty clay and flint gravel containing clinker, ash, and some coal and coke fragments.		2.5ppm				
	1.00	Moist medium dense orange brown SAND with occasional flint gravel and grey discoloured patches. (slight hydrocarbon odour).		31.0ppm	UD 1.0-1.5m	PH1/1 1.0-1.5m		
	1.50	Wet medium dense poorly graded tan brown SAND & GRAVEL with grey discolored patches.(Strong hydrocarbon odour).		48.0ppm	UD 1.5-1.8m	PH1/2 1.5-1.8m		1.5m
	1.80	Boring terminated at 1.80 metres						1.8m

REMARKS:

(1) Hole located near aboveground storage tanks.
(2) Probe refused at 1.8m due to dense gravels.
(3) Water ingress at 1.5m.
(4) Background PID reading = 2.5ppm

DRILLED BY: Geosampling Ltd	START DATE: 07/09/98
LOGGED BY: KMT	COMPLETION DATE: 07/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office,

HEIGHT OF RISER:
TOP OF RISER ELEVATI

GIBB Environmental

PH2

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH2

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	Reinforced CONCRETE.						G.L.
	0.35	MADE GROUND: Firm chocolate brown silty clay & gravel containing small fragments of brick, coal some clinker & coke.(Moderate hydrocarbon odour).		90ppm	UD 0.4-0.6m	PH2/1 0.4-0.6m		
	0.70	MADE GROUND:Orange brown with grey discoloured patches slighty silty sand clay with some gravel and coke fragments. (Moderate hydrocarbon odour).		37ppm 52ppm	UD 0.8-1.0m	PH2/2 0.8-1.0m		
	1.35	Boring terminated at 1.35 metres						1.35m

U:\PROJECTS\DEO\BOURNE\PH2 PI3_KMT-3_9-30-98

REMARKS:

(1) Hole located near fill point of aboveground storage tanks
(2) Probe refused at 1.35m. Hole relocated 1m north west to location PH2A
(3) Background PID reading = 3.8ppm

DRILLED BY: Geosampling Ltd	START DATE: 07/09/98
LOGGED BY: KMT	COMPLETION DATE: 07/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

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BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH2A

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	MADE GROUND: Dark brown/black clayey sand containing many small rootlets, bricks & stones.						G.L.
	0.20	MADE GROUND: Firm chocolate brown very sandy silty clay containing flint gravel, occasional small brick, coal and coke fragments.						
	0.80	MADE GROUND: Mixed grey & orange clayey sand and gravel containing small coal, bricks, and coke fragments. (Hydrocarbon odour).						
	1.10	Moist orange brown and grey SAND with occasional flint gravel. (Strong hydrocarbon odour).		130ppm				
	1.55	Moist orange brown clayey SAND with occasional flint gravel. (Slight hydrocarbon odour).		26ppm				
	1.90	Wet orange brown poorly graded SAND & GRAVEL. (No Odour).		5.7ppm				
	2.00	Boring terminated at 2.00 metres						2.0m

U:\PROJECTS\DEO\BOURNE\PH2A.PI3 KMT-1 9-30-9

REMARKS:

(1) Hole relocated from PH2.
(2) Water ingress at 2.0m.
(3) Background PID reading = 2.6ppm

DRILLED BY: Geosampling Ltd	START DATE: 07/09/98
LOGGED BY: KMT	COMPLETION DATE: 07/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH3

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	Reinforced CONCRETE.		2.8ppm				G.L.
	0.30			7.8ppm				
	0.40	MADE GROUND: Firm orange brown silty clay .						
		MADE GROUND: Orange brown silty sandy clay and gravel.			D 0.5-0.8m	PH3/1 0.5-0.8m		
	0.80			31.4				
		Medium dense orange brown slightly clayey SAND with occasional dark grey streaks. (Slight hydrocarbon odour).			D 0.9-1.2m	PH3/2 0.9-1.2m		
	1.20							
		Dense poorly graded SAND & GRAVEL.						
	1.50	Boring terminated at 1.50 metres		9.0ppm				1.5m

UAPROJECTS\DEO\BOURNE\PH3.PL3 KMT-3 9-30-

REMARKS:

(1) Hole located near fill point of aboveground storage tank.
(2) Concrete broken out using hydraulic breaker.
(3) First metre hand dug.
(4) Probe refused at 1.5m due to dense gravels.
(5) Background PID reading = 2.8ppm

DRILLED BY: Geosampling Ltd	START DATE: 07/09/98
LOGGED BY: KMT	COMPLETION DATE: 07/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH4

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	WELL DIAGRAM	Depth (metres)
	0.00	MADE GROUND: Dark brown silty clayey sand containing many rootlets and stones (TOPSOIL).		3.0ppm				G.L.
	0.10	MADE GROUND: Bricks.						
	0.20	MADE GROUND: Soft medium brown silty clay containing some flint gravel, small brick fragments and occasional coal fragments.		3.0ppm				
	0.70	Medium dense poorly graded orange brown silty CLAY & GRAVEL.		2.8ppm	UD 0.7-1.2m	PH4/1 0.7-1.2m		
	1.30	Medium dense poorly graded tan brown / orange SAND & GRAVEL.		2.8ppm	UD 1.8-2.3m	PH4/2 1.8-2.3m		
	2.50	Boring terminated at 2.50 metres		2.8ppm				2.5m

U:\PROJECTS\DEO\BOURNE\PH4.PI3 KMT-5 9:30:5

REMARKS:

(1) Hole located near underground storage tank.
(2) Probe refused at 2.5m due to dense gravels.
(3) Background PID reading = 2.8ppm.

DRILLED BY: Geosampling Ltd	START DATE: 08/09/98
LOGGED BY: KMT	COMPLETION DATE: 08/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH5

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt anti slip coating						G.L.
	0.05	CONCRETE.						
	0.15	Weathered CONCRETE.						
	0.34	MADE GROUND: Loose black ash.		2.1ppm				
	0.50	MADEGROUND: Soft tan orange / brown silty clay containing occasional gravel and ash.		2.1ppm	UD 0.5-1.0m	PH5/1 0.5-1.0m		
				2.1ppm				
	1.25	Soft to firm tan orange / brown silty CLAY with occasional flint gravel.		2.3ppm	UD 1.3-1.8m	PH5/2 1.3-1.8m		
				2.3ppm				
	2.80	Wet medium dense poorly graded tan orange / brown SAND & GRAVEL.						
	3.00	Boring terminated at 3.00 metres		2.5ppm				3.0ppm

REMARKS:

(1) Hole located in Building Y.
(2) Concrete removed using diamond corer.
(3) Probe refused at 3.0m due to dense gravels.
(4) Background PID reading = 2.1ppm.

DRILLED BY: Geosampling Ltd	START DATE: 08/09/98
LOGGED BY: KMT	COMPLETION DATE: 08/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD RECORDS OFFICE, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

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BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH6

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt anti slip coating.						G.L.
	0.05	CONCRETE.						
	0.15	Weathered CONCRETE.						
	0.25	MADE GROUND: Soft orange brown silty clay.		2.1ppm				
	0.40	MADE GROUND: Loose coarse black ash.			UD 0.45-0.5m	PH6/1 0.45-0.5m		
	0.50	MADE GROUND: Soft dark grey green silty clay.		2.3ppm				
				2.1ppm	UD 0.5-0.75m	PH6/2 0.5-0.75m		
	0.75	MADE GROUND: Soft tan orange/brown silty clay containing occasional stones and black ash fragments.		2.1ppm				
	1.20	Soft tan orange/brown silty CLAY with occasional flint gravel.		2.1ppm				
				2.1ppm				
	2.00	Soft to firm tan orange / brown with grey mottle silty CLAY with occasional flint gravel.		2.1ppm				
					UD 2.0-2.9m	PH6/3 2.0-2.9m		
	2.90	Boring terminated at 2.90 metres		2.1ppm				2.9m

REMARKS:

(1) Hole located in Building Y.
(2) Concrete removed using diamond corer.
(3) Probe refused at 2.9m.
(4) Background PID reading = 2.1m.

DRILLED BY: Geosampling Ltd	START DATE: 08/09/98
LOGGED BY: KMT	COMPLETION DATE: 08/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH7

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt anti slip coating.						G.L.
	0.05	CONCRETE.						
	0.20	Weathered CONCRETE.						
	0.35	MADE GROUND: Soft tan brown / orange slightly sandy silty clay.		2.2ppm	UD 0.35-0.75	PH7/1 0.35-0.75		
	0.75	MADE GROUND: Medium dense poorly graded tan brown / orange clay and gravel containing occasional patches of fine black ash.		2.2ppm	UD 0.75-1.25m	PH7/2 0.75-1.25m		
	1.25	Dense poortly graded tan brown / orange SAND & GRAVEL.		2.2ppm				
	1.70	Boring terminated at 1.70 metres						1.7m

UA\PROJECTS\DEO\BOURNS\PH7.PL3 KMT-1 9-30-98

REMARKS:

(1) Hole located in Y Building.
(2) Concrete removed using diamond corer.
(3) Probe refused at 1.7m due to dense gravel.
(4) Background PID reading = 2.1ppm.

DRILLED BY: Geosampling Ltd	START DATE: 08/09/98
LOGGED BY: KMT	COMPLETION DATE: 08/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH8

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type/Depth	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt anti slip coating.						G.L.
	0.05	CONCRETE.						
	0.14	Weathered CC .CRETE.						
	0.35	MADE GROUND: Loose coarse black ash.						
	0.45	MADE GROUND: Soft tan brown / orange sandy silty clay containing occasional gravel, small coke and ash fragments.		2.2ppm	UD 0.45-0.8m	PH8/1 0.45-0.8m		
	0.80	Medium dense poorly graded tan brown / orange clayey SAND & Gravel.		2.2ppm	UD 0.8-1.2m	PH8/2 0.8-1.2m		
	1.20	Wet medium dense poorly graded tan brown / orange SAND & GRAVEL.						
	1.90	Boring terminated at 1.90 metres						1.9m

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REMARKS:

(1) Hole located in Y Building.
(2) Concrete removed using diamond corer.
(3) Probe refusedat 1.9m due to dense gravels.
(4) Background PID reading = 2.1ppm.

DRILLED BY: Geosampling Ltd	START DATE: 08/09/98
LOGGED BY: KMT	COMPLETION DATE: 08/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH9

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt anti slip coating.						G.L.
	0.05	Reinforced CONCRETE.						
	0.20	Weathered CONCRETE.						
	0.35	MADE GROUND: Stone chippings.						
	0.38	MADE GROUND: Tan brown / orange silty clayey sand containing ash fragments and stones.		2.8ppm	UD 0.38-0.5m	PH9/1 0.38-0.50m		
	0.50	Soft tan brown / orange silty CLAY & GRAVEL.		2.8ppm				
	0.65	Damp medium dense poorly graded tan brown SAND & GRAVEL.		2.8ppm				
	1.00	Moist tan brown SAND.		2.8ppm	UD 1.0-2.5m	PH9/2 1.0-2.5m		
	2.00	Wet medium dense poorly graded SAND & GRAVEL.		2.8ppm				
	2.90	Boring terminated at 2.90 metres		2.8ppm				2.9m

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REMARKS:

(1) Hole located in Building A.
(2) Concrete removed using diamond corer.
(3) Probe refused at 2.9m due to dense gravels.
(4) Background PID reading = 2.5ppm.

DRILLED BY: Geosampling Ltd	START DATE: 07/09/98
LOGGED BY: KMT	COMPLETION DATE: 07/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes.

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH10

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt antislip coating.						G.L.
	0.05	Reinforced CONCRETE.						
	0.20	Weathered CONCRETE.						
	0.35	MADE GROUND: Loose black ash and clinker.		2.8ppm				
	0.45	Soft to firm tan brown / orange with grey mottle SILTY CLAY.		2.8ppm	UD 0.45-1.0m	PH10/1 0.45-1.0m		
	1.10	Moist tan brown / orange slightly clayey SAND.		2.8ppm	UD 1.1-1.7m	PH10/2 1.1-1.7m		
	1.70	Moist medium dense poorly graded flint GRAVEL & SAND.		5.0ppm				
				5.1ppm				
	2.90	Boring terminated at 2.90 metres						2.9m

UAPROJECTS\DEO\BOURNE\PH10.PL3 KMT-2 9-30-98

REMARKS:

(1) Hole located in Building A
(2) Concrete removed using diamond corer.
(3) Probe refused at 2.9m due to coarse gravels.
(4) Background PID reading = 2.5ppm.

DRILLED BY: Geosampling Ltd.	START DATE: 07/09/98
LOGGED BY: KMT	COMPLETION DATE: 07/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes.

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH11

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ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt anti slip coating.						G.L.
	0.05	Reinforced CONCRETE.						
	0.25	Weathered CONCRETE.						
	0.40							
	0.45	MADE GROUND: Stone chippings.						
		MADE GROUND: Soft tan brown / orange sandy silty clay containing specks of ash and some flint gravel.		2.5ppm	UD 0.5-1.0m	PH11/1 0.5-1.0m		
				2.5ppm				
	1.20	Moist medium dense tan brown / orange SAND & GRAVEL.		2.5ppm	UD 1.2-1.9m	PH11/2 1.2-1.9m		
	1.90	Boring terminated at 1.90 metres						1.9m

REMARKS:

(1) Hole located in Building A.
(2) Concrete removed using diamond corer.
(3) Probe refused at 1.9m due to dense gravels.
(4) Background PID reading = 2.5ppm.

DRILLED BY: Geosampling Ltd.	START DATE: 08/09/98
LOGGED BY: KMT	COMPLETION DATE: 08/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes.

HEIGHT OF RISER:
TOP OF RISER ELEVATION:

GIBB Environmental

BORING RECORD

PAGE 1 OF 1

BORING NUMBER PH12

ELEVATION (metres)	DEPTH (metres)	DESCRIPTION	SYMBOL	PID	Sample Type	Sample Reference	Well Diagram	Depth (metres)
	0.00	Asphalt anti slip coating.						G.L.
	0.05	Reinforced CONCRETE.						
	0.25							
	0.28	Weathered CONCRETE.						
		MADE GROUND: Stone chippings.						
	0.40	Soft tan brown / orange silty CLAY.		2.9ppm	UD 0.4-0.6m	PH12/1 0.4-0.6m		
	0.60	Firm tan brown / orange silty CLAY with occasional gravel.		2.9ppm				
	1.20	Moist medium dense orange brown slightly clayey SAND.		3.8ppm				
	1.40	Moist medium dense poorly graded orange brown SAND & GRAVEL.		6.0ppm	UD 1.6-2.7m	PH12/2 1.6-2.7m		
	2.70	Boring terminated at 2.70 metres						2.7m

REMARKS:

(1) Hole located in A Building.
(2) Concrete removed using diamond corer.
(3) Probe refused at 2.7m due to dense gravels.
(4) Background PID reading = 2.5ppm

DRILLED BY: Geosampling Ltd.	START DATE: 07/09/98
LOGGED BY: KMT	COMPLETION DATE: 07/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD Records Office, Hayes.

GIBB Environmental

EIGHT OF RISER:
OP OF RISER ELEVATION:

BORING RECORD

BORING NUMBER PH13

DESCRIPTION	SYMBOL	PID	Sample Type	Sample Reference	Well Diagram	Depth (metres)
Tarmacadam.						G.L.
Weathered CONCRETE.						
Medium dense poorly graded tan brown / orange SAND & GRAVEL.		2.5ppm				
Soft orange brown SAND & GRAVEL and silty CLAY. Some dark grey discoloured patches having hydrocarbon odour.		14.0ppm	UD 0.5-1.0m	PH13/1 0.5-1.0m		
Wet coarse grey green SAND & GRAVEL.		1.2ppm				
Boring terminated at 1.30 metres						1.3m

...ater services at rear
...due to dense gravels.
... 2.5ppm.

DRILLED BY: Geosampling Ltd.	START DATE: 08/09/98
LOGGED BY: KMT	COMPLETION DATE: 08/09/98
CHECKED BY:	JOB NUMBER: J98282A
DRILLING METHOD: Window Sampler	SITE: MOD records Office, Hayes.

GIBB Environmental

TABLE OF RESULTS

Job Number : 98/03013/02/01
Client : GIBB ENVIRONMENTAL
Date of Receipt : 10/09/98
(of first sample)

Sample Type : SOIL
Location : MOD- HAYES
Client Contact : K.THORNTON
Client Ref. No. : J98292A

NAMAS TESTING No. 1291

☐ Preliminary
☑ Validated
☐ NAMAS Accredited

Sample Number	Sample Identity	Depth (m)	Arsenic	Boron (Water Soluble)	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Selenium	Zinc	TPH By Infra Red	pH Value In Soil
Units			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
Detection Method			ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	IR	Meter
Detection Limits			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.01
4	PH 1/1	1.00-1.50	-	-	-	-	-	-	-	-	-	-	343	-
5	PH 1/2	1.50-1.80	-	-	-	-	-	-	-	-	-	-	1111	-
6	PH 2/1	0.40-0.60	-	-	-	-	-	-	-	-	-	-	162	-
9	PH 2/2	0.80-1.00	-	-	-	-	-	-	-	-	-	-	764	-
11	PH 3/1	0.50-0.80	-	-	-	-	-	-	-	-	-	-	154	-
12	PH 3/2	0.90-1.20	-	-	-	-	-	-	-	-	-	-	550	-
14	PH 4/1	0.70-1.20	-	-	-	-	-	-	-	-	-	-	150	-
15	PH 4/2	1.80-2.30	-	-	-	-	-	-	-	-	-	-	166	-
17	PH 5/1	0.50-1.00	6	<1	<1	43	6	<1	17	9	2	45	148	7.61
20	PH 5/2	1.30-1.80	8	<1	<1	29	16	<1	30	5	2	60	134	8.23
24	PH 6/2	0.50-0.75	4	<1	<1	49	32	<1	16	156	1	111	160	7.38
27	PH 6/3	2.00-2.90	6	<1	<1	39	2	<1	14	7	1	38	256	8.02
30	PH 7/1	0.35-0.75	8	<1	<1	61	18	<1	19	20	2	44	185	6.58
34	PH 7/2	0.75-1.25	8	<1	<1	37	2	<1	14	5	<1	22	220	7.41
38	PH 8/1	0.45-0.80	8	<1	<1	37	5	<1	13	14	1	32	173	6.12
41	PH 8/2	0.80-1.20	8	<1	<1	89	3	<1	15	5	<1	26	245	7.53
44	PH 9/1	0.38-0.50	9	<1	<1	56	5	<1	26	3	1	45	207	7.57
47	PH 9/2	1.00-2.50	8	<1	<1	58	4	<1	15	5	<1	25	182	7.91
50	PH 10/1	0.45-1.00	7	<1	<1	33	7	<1	20	6	1	46	191	8.16
53	PH 10/2	1.10-1.70	8	<1	<1	57	5	<1	14	3	<1	43	222	7.93

Checked by ..... Amanda Cockshott

GEOCHEM ANALYTICAL SERVICE

TABLE OF RESULTS

Job Number : 98/03013/02/01
Client : GIBB ENVIRONMENTAL
Date of Receipt : 10/09/98
(of first sample)

Sample Type : SOIL
Location : MOD- HAYES
Client Contact : K.THORNTON
Client Ref. No. : J98292A

NAMAS TESTING No. 1291

☐ Preliminary
☑ Validated
☐ NAMAS Accredited

Sample Number	Sample Identity	Depth (m)	Arsenic	Boron (Water Soluble)	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Selenium	Zinc	TPH By Infra Red	pH Value In Soil				
Units			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm					
Detection Method			ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	IR	Meter				
Detection Limits			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.01				
56	PH 11/1	0.50-1.00	12	<1	<1	20	24	<1	27	41	2	116	197	7.17				
58	PH 11/2	1.20-1.90	9	<1	<1	81	3	<1	20	4	<1	22	-	8.28				
60	PH 12/1	0.40-0.60	6	<1	<1	33	51	<1	21	7	2	43	-	7.58				
63	PH 12/2	1.60-2.70	5	<1	<1	56	35	<1	16	53	<1	25	-	8.22				
65	PH 13/1	0.50-1.00	-	-	-	-	-	-	-	-	-	-	3078	-				

Checked by ..... Amanda Cockshott

GEOCHEM ANALYTICAL SERVICES

TABLE OF RESULTS

Job Number : 98/03013/02/01
Client : GIBB ENVIRONMENTAL
Date of Receipt : 10/09/98
(of first sample)

Sample Type : WATER
Location : MOD- HAYES
Client Contact : K.THORNTON
Client Ref. No. : J98292A

NAMAS TESTING No. 1291

☐ Preliminary
☑ Validated
☐ NAMAS Accredited

Sample Number	Sample Identity	Depth (m)	Arsenic	Boron	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Selenium	Zinc	TPH By Infra Red	pH Value In Water
Units			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
Detection Method			ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	IR	Meter
Detection Limits			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<1	<0.01
67	RINSEATE SAMPLE	UNKNOWN	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	3.4	7.96
68	WASH WATER	UNKNOWN	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	4.0	7.87

Checked by ..... Amanda Cockshott

Geochem Analytical Services

EXPLOSIVES BY USEPA 8330

By

H.P.L.C.

Sample Matrix: soil

Our Reference: 3013

Date Sample Received: 10/9/98

Date Extracted/Prepared: 21/9/98

Date Analysed: 28/9/98

	Sample No.		016	019	023	026	029	033	037	040
	Client Ref.		PH5/1	PH5/2	PH6/2	PH6/3	PH7/1	PH7/2	PH8/1	PH8/2
CAS Number	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2691-41-0	Octahydro-1,3,4,5-tetranitro-1,3,5,7-tetrazocine	HMX	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-35-4	1,3,5-Trinitrobenzene	1,3,5-TNB	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
479-45-8	Methyl-2,4,6-trinitrophenylnitramine	Tetryl	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-65-0	1,3-Dinitrobenzene	1,3-DNB	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
118-96-7	2,4,6-Trinitrotoluene	2,4,6-TNT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
98-95-3	Nitrobenzene	NB	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
606-20-2	2,6-Dinitrotoluene	2,6-DNT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
121-14-2	2,4-Dinitrotoluene	2,4-DNT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
88-72-2	2-Nitrotoluene	2-NT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-08-1	4-Nitrotoluene	4-NT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-99-0	3-Nitrotoluene	3-NT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
				*						

* Nitrobenzene identification confirmed by GCMS

Approved by:.....

Geochem Analytical Services

EXPLOSIVES BY USEPA 8330

By

H.P.L.C.

Sample Matrix: soil

Our Reference: 3013

Date Sample Received: 10/9/98

Date Extracted/Prepared: 21/9/98

Date Analysed: 25/9/98

	Sample No.		043	046	049	052	055	057	059	062
	Client Ref.		PH 9/1	PH 9/2	PH 10/1	PH 10/2	PH 11/1	PH 11/2	PH 12/1	PH 12/2
CAS Number	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2691-41-0	Octahydro-1,3,4,5-tetranitro-1,3,5,7-tetrazocine	HMX	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-35-4	1,3,5-Trinitrobenzene	1,3,5-TNB	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
479-45-8	Methyl-2,4,6-trinitrophenylnitramine	Tetryl	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-65-0	1,3-Dinitrobenzene	1,3-DNB	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
118-96-7	2,4,6-Trinitrotoluene	2,4,6-TNT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
98-95-3	Nitrobenzene	NB	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
606-20-2	2,6-Dinitrotoluene	2,6-DNT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
121-14-2	2,4-Dinitrotoluene	2,4-DNT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
88-72-2	2-Nitrotoluene	2-NT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-08-1	4-Nitrotoluene	4-NT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
99-99-0	3-Nitrotoluene	3-NT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
					*					

* Nitrobenzene identification confirmed by GCMS

Approved by:.....

Geochem Analytical Services

Acid/base neutrals (based on 8270)

Sample Identity - 3013-006 PH 2/1 0.4-0.6
Client / Sample Matrix - Gibb Environmental / Soil
Date Acquired - 10/ 4/19 -1:2:
Instrument Name - GCMS5973
Units - µg/kg

Number	Compound	Amount	Number	Compound	Amount
62-75-9	Nitrosodimethylamine	<1	121-14-2	2,4-Dinitrotoluene	<1
108-95-2	Phenol	8.70	84-66-2	Diethyl Phthalate	5.67
111-44-4	Bis(2-chloroethyl)ether	<1	86-73-7	Fluorene	1.11
95-57-8	Chlorophenol	20.22	7005-72-3	4-Chlorophenylphenylether	<1
95-50-1	1,2-Dichlorobenzene	<1	86-30-6	N-Nitrosodiphenylamine	<1
541-73-1	1,3-Dichlorobenzene	<1	103-33-3	Azobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1	101-55-3	4-Bromophenylphenylether	<1
108-60-1	Bis(2-chloroisopropyl)ether	<1	118-74-1	Hexachlorobenzene	<1
621-64-7	N-Nitrosodi-n-propylamine	<1	87-86-5	Pentachlorophenol	<1
67-72-1	Hexachloroethane	<1	85-01-8	Phenanthrene	4.04
98-95-3	Nitrobenzene	<1	120-12-7	Anthracene	<1
78-59-1	Isophorone	<1	84-74-2	Di-n-butyl Phthalate	70.82
88-75-5	2-Nitrophenol	<1	206-44-0	Fluoranthene	3.25
105-67-9	2,4-Dimethylphenol	<1	92-87-5	Benzidine	<1
111-91-1	Bis(2-chloroethoxy)methane	<1	129-00-0	Pyrene	2.55
120-83-2	2,4-Dichlorophenol	<1	85-68-7	Butyl benzyl Phthalate	2.66
120-82-1	1,2,4-Trichlorobenzene	<1	56-55-3	Benz(a)anthracene	1.29
91-20-3	Naphthalene	5.38	91-94-1	3,3-Dichlorobenzidine	<1
87-68-3	Hexachloro-1,3-butadiene	<1	218-01-9	Chrysene	2.76
59-50-7	4-Chloro-3-methylphenol	<1	117-81-7	Bis(2-ethylhexyl)phthalate	100.77
77-47-4	Hexachlorocyclopentadiene	<1	117-84-0	Di-n-octyl Phthalate	2.49
88-06-2	2,4,6-Trichlorophenol	<1	205-99-2	Benzo(b)fluoranthene	1.23
91-58-7	2-Chloronaphthalene	<1	207-08-9	Benzo(k)fluoranthene	1.46
131-11-3	Dimethyl Phthalate	<1	50-32-8	Benzo(a)pyrene	1.25
208-96-8	Acenaphthylene	<1	191-24-2	Benzo(ghi)perylene	<1
606-20-2	2,6-Dinitrotoluene	<1	53-70-3	Dibenz(ah)anthracene	<1
83-32-9	Acenaphthene	<1	193-39-5	Indeno(123cd)pyrene	<1
100-02-7	4-Nitrophenol	<1			

Approved by - 

Geochem Analytical Services

Acid/base neutrals (based on 8270)

Sample Identity - 3013-009 PH 2/2 0.8-1.0
Client / Sample Matrix - Gibb Environmental / Soil
Date Acquired - 10/ 4/19 -1:2:
Instrument Name - GCMS5973
Units - µg/kg

Number	Compound	Amount	Number	Compound	Amount
62-75-9	Nitrosodimethylamine	<1	121-14-2	2,4-Dinitrotoluene	<1
108-95-2	Phenol	7.50	84-66-2	Diethyl Phthalate	<1
111-44-4	Bis(2-chloroethyl)ether	<1	86-73-7	Fluorene	181.87
95-57-8	Chlorophenol	29.33	7005-72-3	4-Chlorophenylphenylether	<1
95-50-1	1,2-Dichlorobenzene	<1	86-30-6	N-Nitrosodiphenylamine	<1
541-73-1	1,3-Dichlorobenzene	<1	103-33-3	Azobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1	101-55-3	4-Bromophenylphenylether	<1
108-60-1	Bis(2-chloroisopropyl)ether	<1	118-74-1	Hexachlorobenzene	<1
621-64-7	N-Nitrosodi-n-propylamine	<1	87-86-5	Pentachlorophenol	<1
67-72-1	Hexachloroethane	<1	85-01-8	Phenanthrene	414.16
98-95-3	Nitrobenzene	<1	120-12-7	Anthracene	<1
78-59-1	Isophorone	<1	84-74-2	Di-n-butyl Phthalate	119.94
88-75-5	2-Nitrophenol	<1	206-44-0	Fluoranthene	43.32
105-67-9	2,4-Dimethylphenol	512.89	92-87-5	Benzidine	<1
111-91-1	Bis(2-chloroethoxy)methane	<1	129-00-0	Pyrene	59.23
120-83-2	2,4-Dichlorophenol	<1	85-68-7	Butyl benzyl Phthalate	<1
120-82-1	1,2,4-Trichlorobenzene	<1	56-55-3	Benz(a)anthracene	13.37
91-20-3	Naphthalene	24.37	91-94-1	3,3-Dichlorobenzidine	<1
87-68-3	Hexachloro-1,3-butadiene	<1	218-01-9	Chrysene	23.38
59-50-7	4-Chloro-3-methylphenol	<1	117-81-7	Bis(2-ethylhexyl)phthalate	154.19
77-47-4	Hexachlorocyclopentadiene	<1	117-84-0	Di-n-octyl Phthalate	2.36
88-06-2	2,4,6-Trichlorophenol	<1	205-99-2	Benzo(b)fluoranthene	5.48
91-58-7	2-Chloronaphthalene	<1	207-08-9	Benzo(k)fluoranthene	10.30
131-11-3	Dimethyl Phthalate	<1	50-32-8	Benzo(a)pyrene	9.64
208-96-8	Acenaphthylene	462.07	191-24-2	Benzo(ghi)perylene	4.89
606-20-2	2,6-Dinitrotoluene	<1	53-70-3	Dibenz(ah)anthracene	<1
83-32-9	Acenaphthene	62.35	193-39-5	Indeno(123cd)pyrene	4.90
100-02-7	4-Nitrophenol	<1			

Approved by - 

Geochem Analytical Services

Acid/base neutrals (based on 8270)

Sample Identity - 3013-012 PH 3/2 0.9-1.2
Client / Sample Matrix - Gibb Environmental / Soil
Date Acquired - 10/ 4/19 -1:3:
Instrument Name - GCMS5973
Units - µg/kg

Number	Compound	Amount
62-75-9	Nitrosodimethylamine	<1
108-95-2	Phenol	9.71
111-44-4	Bis(2-chloroethyl)ether	<1
95-57-8	Chlorophenol	14.41
95-50-1	1,2-Dichlorobenzene	<1
541-73-1	1,3-Dichlorobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1
108-60-1	Bis(2-chloroisopropyl)ether	<1
621-64-7	N-Nitrosodi-n-propylamine	<1
67-72-1	Hexachloroethane	<1
98-95-3	Nitrobenzene	<1
78-59-1	Isophorone	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
111-91-1	Bis(2-chloroethoxy)methane	<1
120-83-2	2,4-Dichlorophenol	<1
120-82-1	1,2,4-Trichlorobenzene	<1
91-20-3	Naphthalene	10.43
87-68-3	Hexachloro-1,3-butadiene	<1
59-50-7	4-Chloro-3-methylphenol	<1
77-47-4	Hexachlorocyclopentadiene	<1
88-06-2	2,4,6-Trichlorophenol	<1
91-58-7	2-Chloronaphthalene	<1
131-11-3	Dimethyl Phthalate	<1
208-96-8	Acenaphthylene	768.20
606-20-2	2,6-Dinitrotoluene	<1
83-32-9	Acenaphthene	25.86
100-02-7	4-Nitrophenol	<1

Number	Compound	Amount
121-14-2	2,4-Dinitrotoluene	<1
84-66-2	Diethyl Phthalate	<1
86-73-7	Fluorene	82.43
7005-72-3	4-Chlorophenylphenylether	<1
86-30-6	N-Nitrosodiphenylamine	<1
103-33-3	Azobenzene	<1
101-55-3	4-Bromophenylphenylether	<1
118-74-1	Hexachlorobenzene	<1
87-86-5	Pentachlorophenol	<1
85-01-8	Phenanthrene	162.61
120-12-7	Anthracene	<1
84-74-2	Di-n-butyl Phthalate	193.08
206-44-0	Fluoranthene	14.64
92-87-5	Benzidine	<1
129-00-0	Pyrene	36.11
85-68-7	Butyl benzyl Phthalate	<1
56-55-3	Benz(a)anthracene	6.07
91-94-1	3,3-Dichlorobenzidine	<1
218-01-9	Chrysene	9.39
117-81-7	Bis(2-ethylhexyl)phthalate	146.25
117-84-0	Di-n-octyl Phthalate	2.54
205-99-2	Benzo(b)fluoranthene	1.80
207-08-9	Benzo(k)fluoranthene	2.36
50-32-8	Benzo(a)pyrene	2.10
191-24-2	Benzo(ghi)perylene	1.28
53-70-3	Dibenz(ah)anthracene	<1
193-39-5	Indeno(123cd)pyrene	1.79

Approved by -

Geochem Analytical Services

Acid/base neutrals (based on 8270)

Sample Identity - 3013-030 PH 7/1 0.35-0.75
Client / Sample Matrix - Gibb Environmental / Soil
Date Acquired - 10/ 4/19 -1:4:
Instrument Name - GCMS5973
Units - µg/kg

Number	Compound	Amount	Number	Compound	Amount
62-75-9	Nitrosodimethylamine	<1	121-14-2	2,4-Dinitrotoluene	<1
108-95-2	Phenol	7.87	84-66-2	Diethyl Phthalate	5.35
111-44-4	Bis(2-chloroethyl)ether	<1	86-73-7	Fluorene	<1
95-57-8	Chlorophenol	25.39	7005-72-3	4-Chlorophenylphenylether	<1
95-50-1	1,2-Dichlorobenzene	<1	86-30-6	N-Nitrosodiphenylamine	<1
541-73-1	1,3-Dichlorobenzene	<1	103-33-3	Azobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1	101-55-3	4-Bromophenylphenylether	<1
108-60-1	Bis(2-chloroisopropyl)ether	<1	118-74-1	Hexachlorobenzene	<1
621-64-7	N-Nitrosodi-n-propylamine	<1	87-86-5	Pentachlorophenol	<1
67-72-1	Hexachloroethane	<1	85-01-8	Phenanthrene	4.25
98-95-3	Nitrobenzene	<1	120-12-7	Anthracene	1.05
78-59-1	Isophorone	<1	84-74-2	Di-n-butyl Phthalate	101.31
88-75-5	2-Nitrophenol	<1	206-44-0	Fluoranthene	5.12
105-67-9	2,4-Dimethylphenol	<1	92-87-5	Benzidine	<1
111-91-1	Bis(2-chloroethoxy)methane	<1	129-00-0	Pyrene	4.16
120-83-2	2,4-Dichlorophenol	<1	85-68-7	Butyl benzyl Phthalate	<1
120-82-1	1,2,4-Trichlorobenzene	<1	56-55-3	Benz(a)anthracene	1.97
91-20-3	Naphthalene	3.16	91-94-1	3,3-Dichlorobenzidine	<1
87-68-3	Hexachloro-1,3-butadiene	<1	218-01-9	Chrysene	3.62
59-50-7	4-Chloro-3-methylphenol	<1	117-81-7	Bis(2-ethylhexyl)phthalate	133.42
77-47-4	Hexachlorocyclopentadiene	<1	117-84-0	Di-n-octyl Phthalate	2.41
88-06-2	2,4,6-Trichlorophenol	<1	205-99-2	Benzo(b)fluoranthene	1.44
91-58-7	2-Chloronaphthalene	<1	207-08-9	Benzo(k)fluoranthene	2.06
131-11-3	Dimethyl Phthalate	<1	50-32-8	Benzo(a)pyrene	1.82
208-96-8	Acenaphthylene	73.18	191-24-2	Benzo(ghi)perylene	<1
606-20-2	2,6-Dinitrotoluene	<1	53-70-3	Dibenz(ah)anthracene	<1
83-32-9	Acenaphthene	<1	193-39-5	Indeno(123cd)pyrene	<1
100-02-7	4-Nitrophenol	<1			

Approved by - 

Geochem Analytical Services

Acid/base neutrals (based on 8270)

Sample Identity - 3013-034 PH 7/2 0.75-1.25
Client / Sample Matrix - Gibb Environmental / Soil
Date Acquired - 10/ 4/19 -1:5:
Instrument Name - GCMS5973
Units - µg/kg

Number	Compound	Amount
62-75-9	Nitrosodimethylamine	<1
108-95-2	Phenol	10.68
111-44-4	Bis(2-chloroethyl)ether	<1
95-57-8	Chlorophenol	19.43
95-50-1	1,2-Dichlorobenzene	<1
541-73-1	1,3-Dichlorobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1
108-60-1	Bis(2-chloroisopropyl)ether	<1
621-64-7	N-Nitrosodi-n-propylamine	<1
67-72-1	Hexachloroethane	<1
98-95-3	Nitrobenzene	<1
78-59-1	Isophorone	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	<1
111-91-1	Bis(2-chloroethoxy)methane	<1
120-83-2	2,4-Dichlorophenol	<1
120-82-1	1,2,4-Trichlorobenzene	<1
91-20-3	Naphthalene	6.11
87-68-3	Hexachloro-1,3-butadiene	<1
59-50-7	4-Chloro-3-methylphenol	<1
77-47-4	Hexachlorocyclopentadiene	<1
88-06-2	2,4,6-Trichlorophenol	<1
91-58-7	2-Chloronaphthalene	<1
131-11-3	Dimethyl Phthalate	<1
208-96-8	Acenaphthylene	190.98
606-20-2	2,6-Dinitrotoluene	<1
83-32-9	Acenaphthene	4.23
100-02-7	4-Nitrophenol	<1

Number	Compound	Amount
121-14-2	2,4-Dinitrotoluene	<1
84-66-2	Diethyl Phthalate	10.43
86-73-7	Fluorene	3.12
7005-72-3	4-Chlorophenylphenylether	<1
86-30-6	N-Nitrosodiphenylamine	<1
103-33-3	Azobenzene	<1
101-55-3	4-Bromophenylphenylether	<1
118-74-1	Hexachlorobenzene	<1
87-86-5	Pentachlorophenol	<1
85-01-8	Phenanthrene	7.91
120-12-7	Anthracene	1.47
84-74-2	Di-n-butyl Phthalate	330.56
206-44-0	Fluoranthene	5.93
92-87-5	Benzidine	<1
129-00-0	Pyrene	3.75
85-68-7	Butyl benzyl Phthalate	5.21
56-55-3	Benz(a)anthracene	<1
91-94-1	3,3-Dichlorobenzidine	<1
218-01-9	Chrysene	2.50
117-81-7	Bis(2-ethylhexyl)phthalate	227.68
117-84-0	Di-n-octyl Phthalate	3.20
205-99-2	Benzo(b)fluoranthene	<1
207-08-9	Benzo(k)fluoranthene	1.14
50-32-8	Benzo(a)pyrene	<1
191-24-2	Benzo(ghi)perylene	<1
53-70-3	Dibenz(ah)anthracene	<1
193-39-5	Indeno(123cd)pyrene	<1

Approved by - 

Geochem Analytical Services

Acid/base neutrals (based on 8270)

Sample Identity - 3013-065 PH 13/1 0.5-1.0
Client / Sample Matrix - Gibb Environmental / Soil
Date Acquired - 10/ 4/19 -1:5:
Instrument Name - GCMS5973
Units - µg/kg

Number	Compound	Amount
62-75-9	Nitrosodimethylamine	<1
108-95-2	Phenol	10.83
111-44-4	Bis(2-chloroethyl)ether	<1
95-57-8	Chlorophenol	14.41
95-50-1	1,2-Dichlorobenzene	<1
541-73-1	1,3-Dichlorobenzene	<1
106-46-7	1,4-Dichlorobenzene	<1
108-60-1	Bis(2-chloroisopropyl)ether	<1
621-64-7	N-Nitrosodi-n-propylamine	<1
67-72-1	Hexachloroethane	<1
98-95-3	Nitrobenzene	<1
78-59-1	Isophorone	<1
88-75-5	2-Nitrophenol	<1
105-67-9	2,4-Dimethylphenol	1082.04
111-91-1	Bis(2-chloroethoxy)methane	<1
120-83-2	2,4-Dichlorophenol	<1
120-82-1	1,2,4-Trichlorobenzene	<1
91-20-3	Naphthalene	11,75
87-68-3	Hexachloro-1,3-butadiene	<1
59-50-7	4-Chloro-3-methylphenol	<1
77-47-4	Hexachlorocyclopentadiene	<1
88-06-2	2,4,6-Trichlorophenol	<1
91-58-7	2-Chloronaphthalene	<1
131-11-3	Dimethyl Phthalate	<1
208-96-8	Acenaphthylene	1133.22
606-20-2	2,6-Dinitrotoluene	<1
83-32-9	Acenaphthene	77.98
100-02-7	4-Nitrophenol	<1

Number	Compound	Amount
121-14-2	2,4-Dinitrotoluene	<1
84-66-2	Diethyl Phthalate	<1
86-73-7	Fluorene	71.33
7005-72-3	4-Chlorophenylphenylether	<1
86-30-6	N-Nitrosodiphenylamine	<1
103-33-3	Azobenzene	<1
101-55-3	4-Bromophenylphenylether	<1
118-74-1	Hexachlorobenzene	<1
87-86-5	Pentachlorophenol	<1
85-01-8	Phenanthrene	293.64
120-12-7	Anthracene	147.81
84-74-2	Di-n-butyl Phthalate	143.03
206-44-0	Fluoranthene	878.32
92-87-5	Benzidine	<1
129-00-0	Pyrene	788.94
85-68-7	Butyl benzyl Phthalate	<1
56-55-3	Benz(a)anthracene	359.41
91-94-1	3,3-Dichlorobenzidine	<1
218-01-9	Chrysene	436.16
117-81-7	Bis(2-ethylhexyl)phthalate	258.64
117-84-0	Di-n-octyl Phthalate	20.52
205-99-2	Benzo(b)fluoranthene	223.61
207-08-9	Benzo(k)fluoranthene	250.53
50-32-8	Benzo(a)pyrene	317.10
191-24-2	Benzo(ghi)perylene	199.07
53-70-3	Dibenz(ah)anthracene	35.61
193-39-5	Indeno(123cd)pyrene	175.71

Approved by -

Geochem Analytical Services

Polychlorinated Biphenyls
by
GCMS

Sample Matrix : Soil
Our Reference: 98/3013/02/01
Date Sample Received: 10/09/98
Date Extracted/Prepared: 24/09/98
Extraction procedure: Microwave
Column Extraction: No
Date Analysed: 25/09/98
GC-MS Mode: SIM
Internal Standard: External

	Sample No.	001	002	003		
	Client Ref.	HA 1	HA 2	HA4		
	P.Q.L.	1	1	1		
CAS Number	Units	µg/kg	µg/kg	µg/kg		
12674-11-2	Aroclor 1016					
11104-28-2	Aroclor 1221					
11141-16-5	Aroclor 1232					
53469-21-9	Aroclor 1242					
12672-29-6	Aroclor 1248					
11097-69-1	Aroclor 1254					
11096-82-5	Aroclor 1260					
	Total	<1	<1	<1		

Calculated against Aroclor 1254.

Approved by

Geochem Analytical Services

Semi-Volatiles
By
G.C.M.S.

Sample Matrix: Water
Our Reference: 98/3013/02/01
Date Sample Received: 10/09/98
Date Extracted/Prepared: 22/09/98
Extraction procedure: N/A
Column Extraction: Yes
Date Analysed: 24/09/98
GC-MS Mode: SCAN
Internal Standard: External

Sample Number	067
Sample Identity	Rinseate Water
P.Q.L.	10
Units	µg/l
1	<10
2	<10
3	<10
4	14
5	<10
6	<10
7	12
8	<10
9	<10
10	<10
11	<10
12	<10
13	<10
14	<10

Approved by .....

Full library search report Page 1

rch results for Data File /chem/hp1/23Sept98/2201022_bsb1.d
013-067 SCAN
Injected Thu Sep 24 98 05:04:15 AM by **BSB** MODIFIED

Peak Number	Retention Time	Prob.	Compound Name
1	4.117	2	Ethanethiol, 2-amino-, hydrochloride
2	4.253	25	1,3-Cyclopentadiene, 5-(1-methylethylide
3	4.607	9	Benzene, (azidomethyl)-
4	4.934	53	2H-Pyran, 3,4-dihydro-
5	5.015	36	Cyclohexane, 1,4-dimethyl-
6	5.151	9	Acetamide
7	5.451	64	Cyclohexane, 1-ethyl-2-methyl-, cis-
8	5.805	9	1H-Pyrrole-2-carboxylic acid, 1-ethenyl-
9	10.430	9	1,3-Butadiyne
10	10.811	28	Hydroxylamine, O-(2-methylpropyl)-
11	12.090	4	2-Butyne-1,4-diol, diformate
12	13.723	32	Benzonitrile, 4-(2-phenylethenyl)-
13	19.083	9	Oxazole, 2,4-dimethyl-
14	22.947	4	1,3,5-Trioxepane

Geochem Analytical Services

Semi-Volatiles
By
G.C.M.S.

Sample Matrix: Water
Our Reference: 98/3013/02/01
Date Sample Received: 10/09/98
Date Extracted/Prepared: 22/09/98
Extraction procedure: N/A
Column Extraction: Yes
Date Analysed: 24/09/98
GC-MS Mode: SCAN
Internal Standard: External

Sample Number	068
Sample Identity	Wash Water
P.Q.L.	10
Units	µg/l
1	<10
2	<10
3	<10
4	12
5	<10
6	<10
7	<10
8	<10
9	<10
10	<10
11	<10

Approved by .....

arch results for Data File /chem/hp1/23Sept98/2301023_bsb1.d
3013-068 SCAN
Injected Thu Sep 24 98 05:43:55 AM by **BSB** MODIFIED

Peak Number	Retention Time	Prob.	Compound Name
1	4.117	9	2-Butyne-1,4-diol, diformate
2	4.253	43	2-Propenenitrile, 2-methyl-
3	4.607	10	1,5-Hexadiyne
4	4.933	27	2-Pentenal, (E)-
5	5.015	12	3-Hexene, 2,2-dimethyl-, (Z)-
6	5.150	9	Oxepane, 2,2,3-trimethyl-
7	5.450	64	Cyclohexane, 1,3-dimethyl-, trans-
8	5.803	12	Naphthalene, 2-decyldecahydro-
9	13.724	9	Phenol, 4,6-di(1,1-dimethylethyl)-2-meth
10	22.943	45	Benzenehexanamine
11	26.589	4	Acetaldehyde

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-008 PH 2/1 0.4-0.6m
Client / Sample matrix - Gibb Environmental / Soil
Date Acquired - 09/24/98 04:41
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	19
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	15
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	16
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	<1	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	25
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	66
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	66
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	54
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	82
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	100
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	<1	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3

** Water blank subtracted

Approved by - .....

GEOCHEM ANALYTICAL SERVICES

Tentatively Identified Compounds
by
GCMS

NAMAS TESTING No. 1291

Method - Headspace
Mode - Full scan
Matrix - Soil
Sample No. - 3013-008
Sample ID \ Depth - PH2/1 0.4-0.6m

Peak No.	Compound Identification	RetentionTime min	Concentration µg/kg
A	Nonane, 3-methyl-	13.47	875
B	Nonane, 4-methyl-	14.19	999
C	Decane, 4-methyl-	15.83	1200
D	Decane, 3-methyl-	17.05	869
E	No matches found	18.23	1187
F	No matches found	19.12	931
G	No matches found	19.96	1051
H	Dodecane, 6-methyl-	20.55	942
I	Cyclohexane, 2-propenyl-	21.18	1224
J	Nonane, 3-methyl-	21.91	1440
-	Total other volatiles	-	27175

Approved by : .....

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-010 PH 2/2 0.8-1.0m
Client / Sample matrix - Gibb Environmental / Soil
Date Acquired - 09/24/98 03:24
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	20
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	21
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	<1	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	28
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	81
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	15
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	60
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	33
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	41
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	37
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	<1	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

GEOCHEM

GEOCHEM ANALYTICAL SERVICES

Tentatively Identified Compounds
by
GCMS

NAMAS TESTING No. 1291

Method - Headspace
Mode - Full scan
Matrix - Soil
Sample No. - 3013-010
Sample ID \ Depth - PH2/2 0.8-1.0m

Peak No.	Compound Identification	RetentionTime min	Concentration µg/kg
A	Decane, 4-methyl-	15.84	386
B	Decane, 3-methyl-	17.03	352
C	Naphthalene, decahydro-2-methyl-	18.22	385
D	Benzene, (2-chloro-2-butenyl)-	19.96	511
E	No matches found	21.01	334
F	No matches found	21.18	566
G	No matches found	21.54	383
H	Nonane, 3-methyl-	21.91	656
I	Nonadecane	22.44	410
J	Naphthalene, 1,2,3,4-tetrahydro-6,7-dimethy	22.78	404
-	Total other volatiles	-	9689

Approved by : .....

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-013 PH 3/2 0.9-1.2m
Client / Sample matrix - Gibb Environmental / Soil
Date Acquired - 09/24/98 04:03
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	<1
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	<1
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	<1	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	<1
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	18
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	<1
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	<1
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	<1	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

GEOCHEM

GEOCHEM ANALYTICAL SERVICES

Tentatively Identified Compounds
by
GCMS

NAMAS TESTING No. 1291

Method - Headspace
Mode - Full scan
Matrix - Soil
Sample No. - 3013-013
Sample ID \ Depth - PH3/2 0.9-1.2m

Peak No.	Compound Identification	RetentionTime min	Concentration µg/kg
A	Decane, 4-methyl-	15.83	558
B	No matches found	18.22	754
C	No matches found	19.11	466
D	No matches found	19.95	858
E	Undecane, 2,6-dimethyl-	20.55	557
F	No matches found	21.18	959
G	Dodecane, 4-methyl-	21.55	582
H	Hexadecane, 7,9-dimethyl-	21.91	1608
I	No matches found	22.79	686
J	Cyclohexane, 2-propenyl-	23.50	542
-	Total other volatiles	-	12737

Approved by : .....

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-022 PH 6/1 0.45-0.5m
Client / Sample matrix - Gibb Environmental / Soil
Date Acquired - 09/24/98 00:51
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	<1
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	<1
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	<1	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	<1
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	<1
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	<1
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	<1	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-032 PH 7/1 0.35-0.75m
Client / Sample matrix - Gibb Environmental / Soil
Date Acquired - 09/24/98 01:30
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	<1
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	<1
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	<1	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	<1
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	<1
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	<1
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	4	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	<1	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-036 PH 7/2 0.75-1.25m
Client / Sample matrix - Gibb Environmental / Soil
Date Acquired - 09/24/98 02:08
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	<1
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	<1
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	<1	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	<1
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	<1
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	<1
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	<1	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-066 PH 13/1 0.5-1.0m
Client / Sample matrix - Gibb Environmental / Soil
Date Acquired - 09/24/98 02:46
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	<1
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	<1
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	<1	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	<1
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	<1
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	<1
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	<1	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

GEOCHEM

GEOCHEM ANALYTICAL SERVICES

Tentatively Identified Compounds
by
GCMS

NAMAS TESTING No. 1291

Method - Headspace
Mode - Full scan
Matrix - Soil
Sample No. - 3013-066
Sample ID \ Depth - PH13/1 0.5-1.0m

Peak No.	Compound Identification	RetentionTime min	Concentration µg/kg
A	Decane, 4-methyl-	15.82	74
B	Dihydrocarvone	18.22	142
C	Heptadecane	18.48	93
D	Naphthalene, decahydro-2-methyl-	18.64	105
E	No matches found	19.11	71
F	No matches found	19.95	135
G	Undecane, 2,6-dimethyl-	20.54	274
H	No matches found	21.56	84
I	Nonane, 3-methyl-	21.91	176
J	Cyclopentane, 1-butyl-2-propyl-	22.27	116
-	Total other volatiles	-	1138

Approved by : .....

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-068 Wash Water
Client / Sample matrix - Gibb Environmental / Water
Date Acquired - 09/24/98 00:13
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	<1
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	<1
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	2	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	<1
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	<1
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	<1
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	<1
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	10	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

GIBB ENVIRONMENTAL

LANDFILL GAS MONITORING RECORD - SUB-SURFACE INSTALLATIONS

PROJECT NO:	J98282A
PROJECT NAME:	DEO- LQA 09364
NAME OF SITE:	MOD Records Office, Hayes
MONITORED BY:	K.Thornton
DATE:	04/09/98
DATA CHECKED BY:	T.Morgan
DATE:	01/10/98

GENERAL INFORMATION

Type of installation	Borehole - Unknown specification				
Weather at time of monitoring	Foggy, cold, dry becoming bright and sunny				
Ground surface conditions at time of monitoring	Grass surface, dry				
Atmospheric pressure & time at start of monitoring	1003 @ 10.30am				
Atmospheric pressure & time at end of monitoring	999 @ 12.10pm				
General trend in atmospheric pressure over previous 3 days	Rising Rapidly	Rising Slowly	Approx Constant	Falling Slowly	Falling Rapidly
				5mb	

INSTRUMENTS USED

PARAMETER	INSTRUMENT TYPE / MAKE	SERIAL NUMBER
Methane, Carbon Dioxide, Oxygen	Geotechnical Instruments Infra Red	946

Results entered on Sheet (2)

FIELD MEASUREMENTS - DATE:								
Monitoring well no.	Time	Differential Pressure (mbar)	Methane % v/v	Flammable gases ppm	Oxygen % v/v	Carbon Dioxide % v/v	Barometric pressure (mb)	Comments
BH2	10.55	0	<0.1	<1	20.1	0.2	1003	
BH3	10.50	0	<0.1	<1	18.9	2.0	1002	
BH6	10.44	0	<0.1	<1	18.5	2.5	1001	
BH8	11.50	0	<0.1	<1	16.5	5.0	1001	
BH9	11.40	0	<0.1	<1	16.5	5.5	1002	
BH15(W)	10.35	0	<0.1	<1	18.9	1.9	1003	
BH15(B)	10.30	0	<0.1	<1	18.7	2.2	1003	
BH16(W)	10.40	0	<0.1	<1	17.8	3.1	1002	
BH16(B)	10.42	0	<0.1	<1	16.5	5.0	1002	
BH17(W)	11.55	0	<0.1	<1	18.7	1.6	1000	
BH17(B)	12.00	0	<0.1	<1	18.3	2.0	1001	
BH18(W)	12.06	0	<0.1	<1	18.6	1.8	999	
BH18(B)	12.10	0	<0.1	<1	18.4	2.0	999	

Geochem Analytical Services

Volatile Organic Compounds (EPA 624/8260)

Sample Identity - 3013-067 Rinseate Sample
Client / Sample matrix - Gibb Environmental / Water
Date Acquired - 09/23/98 23:35
Instrument Name - MSD Vols5
Units - ppb

CAS No.	Compound	Conc.	CAS No.	Compound	Conc.
75-71-8	Dichlorodifluoromethane	<1	127-18-4	Tetrachloroethene	<1
74-87-3	Chloromethane	<1	630-20-6	1,1,1,2-Tetrachloroethane	<1
75-01-4	Vinyl chloride	<1	108-90-7	Chlorobenzene	<1
74-83-9	Bromomethane	<1	100-41-4	Ethylbenzene	<1
75-00-3	Chloroethane	<1	108-38-3*	p/m-Xylene	<1
75-69-4	Trichlorofluoromethane	<1	75-25-2	Bromoform	<1
156-60-5	trans-1,2-Dichloroethene	<1	100-42-5	Styrene	<1
75-09-2	Dichloromethane	<1	79-34-5	1,1,2,2-Tetrachloroethane	<1
75-35-4	1,1-Dichloroethene	<1	95-47-6	o-Xylene	<1
75-34-3	1,1-Dichloroethane	<1	96-18-4	1,2,3-Trichloropropane	<1
156-59-2	cis-1,2-Dichloroethene	<1	98-82-8	Isopropylbenzene	<1
74-97-5	Bromochloromethane	<1	108-86-1	Bromobenzene	<1
67-66-3	Chloroform	2	95-49-8	2-Chlorotoluene	<1
594-20-7	2,2-Dichloropropane	<1	103-65-1	Propylbenzene	<1
107-06-2	1,2-Dichloroethane	<1	106-43-4	4-Chlorotoluene	<1
71-55-6	1,1,1-Trichloroethane	<1	95-63-6	1,2,4-Trimethylbenzene	<1
563-58-6	1,1-Dichloropropene	<1	99-87-6	4-Isopropyltoluene	<1
71-43-2	Benzene	<1	108-67-8	1,3,5-Trimethylbenzene	4
56-23-5	Carbontetrachloride	<1	95-50-1	1,2-Dichlorobenzene	<1
74-95-3	Dibromomethane	<1	106-46-7	1,4-Dichlorobenzene	<1
78-87-5	1,2-Dichloropropane	<1	135-98-8	sec-Butylbenzene	<1
75-27-4	Bromodichloromethane	<1	98-06-6	tert-Butylbenzene	<1
79-01-6	Trichloroethene	<1	541-73-1	1,3-Dichlorobenzene	<1
10061-01-5	cis-1,3-Dichloropropene	<1	104-51-8	n-Butylbenzene	<1
10061-02-6	trans-1,3-Dichloropropene	<1	96-12-8	1,2-Dibromo-3-chloropropane	<1
79-00-5	1,1,2-Trichloroethane	<1	120-82-1	1,2,4-Trichlorobenzene	<1
108-88-3	Toluene	<1	91-20-3	Naphthalene	<1
142-28-9	1,3-Dichloropropane	<1	87-61-6	1,2,3-Trichlorobenzene	<1
124-48-1	Dibromochloromethane	10	87-68-3	Hexachlorobutadiene	<1
106-93-4	1,2-Dibromoethane	<1			

N.B. * also CAS No. 106-42-3 ** Water blank subtracted

Approved by - .....

Norwest Holst Soil Engineering Ltd.

Borehole No. **25**

Contract No. F4202 — **BOREHOLE LOG**

Location Yiewsley By-Pass — Sheet 1 of 1

Client London Borough of Hillingdon — Chainage

Method of Boring Percussion — TQ07NE - 399 — Ground Level 34.400 m.A.O.D.

Diameter of Borehole 150mm — 0762, 7929 — Date 19.4.79

Description of Strata	Legend	Depth Below G.L.(m)	O.D. Level (m)	Casing Depth	Sampling and Coring	"N"/ R.Q.D.%	Daily Progress
Dark brown sandy TOPSOIL with small stones and some clay		0.50	33.90				
MADEGROUND: Domestic refuse: Moderately compact but containing much degradable materials including paper, rags, wood and plant material, also rubber, plastic, leather stones and brick fragments		4.50	29.90		1.00 2.00 3.00 4.00		
Soft /firm brown silty CLAY		4.55	29.85		4.55	(98)	
Very dense brown sub-angular/sub-rounded medium and coarse flint GRAVEL with coarse sand		8.00	26.40	150mm to 8.00	5.00 C 6.00 Δ C 7.00 C	80 for 20mm 64 26	
Firm orange brown mottled silty CLAY		8.50	25.90		8.00 8.50	(61)	
Stiff blue grey fissured silty CLAY (London Clay)		10.00	24.40		9.50	(61)	19/4

Type of Sample

D S.P.T.	■ Undisturbed		
Ic. C.P.T.	× Vane		
O Jar	Δ Water		
B Bulk	Piezometer		

Remarks (Observations of Ground Water etc.)

Standpipe installed to 9.50m
Blows required to drive U4 samples given in brackets under 'N'
Fill unsuitable for SPT due to numerous obstructions
Water seepage medium at 6.00m
Standing level 6.00m
Water added during penetration of gravel.
Water level 2.5.79 4.65 m 15.5.79 4.66 m

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

[TQ07NE BJ 399 .]

TQ07NE200020

Appendix C

Exploratory Hole Logs

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	BH01
CLIENT	ProLogis Developments Limited	DATE	23/09/2003
METHOD	Cable Percussion	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
			MADE GROUND: Turf over stiff brown sandy clay. Occasional rootlets. Rare gravel sized fragments of ceramic and flint.						
		1.20				31.61			N=8 (0,5,2,2,2,2)
		1.80	MADE GROUND: Loose to medium dense brown clayey silty sand. Occasional fine sand lenses in soft gravel sized pockets of clay. Rare rootlets.			31.01	B 1.60	B 001	
			MADE GROUND: Soft brown slightly sandy clay with rare wire and occasional gravel sized fragments of fine to coarse subangular brick and coal.						N=8 (0,3,1,2,2,3)
		2.70				30.11	B 2.70	B 002	
		2.90	Firm medium brown sandy CLAY. Occasional gravel sized fragments of flint and sandstone. Becoming moist (LANGLEY SILT).			29.91	B 2.90	B 003	N=31 (3,3,5,8,9,9)
▼			Dense orange and brown sandy GRAVEL. Gravel is mixed lithology including angular to rounded fine to coarse sandstone and flint (LYNCH HILL GRAVELS).				B 4.00	B 004	N=35 (3,4,8,8,9,10)
▼							B 5.00	B 005	
		5.10				27.71	B 5.10	B 006	N=19 (3,4,5,4,4,6)
		5.80	Firm orange brown CLAY with occasional fine to medium gravel sized fragments of flint and rare sand (LONDON CLAY, WEATHERING GRADE E).			27.01			
			Firm to stiff grey CLAY. Rare silty parting between 5.80 and 6.00mbgl.						
			At 9.00 occasional subangular medium gravel sized fragments of very weak claystone (LONDON CLAY, WEATHERING GRADE D).				◎ 6.50	U 001	
							B 7.50	B 007	
							◎ 8.00	U 002	
							B 9.60	B 008	
							◎ 9.50	U 003	

End of Borehole at 10.00 m

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS

1. Groundwater encountered at 4.40mbgl stabilised at 3.70mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
507853.82	179338.13	32.805
LOGGED BY	SCALE	Sheet 1 of 1
KJS	1:50	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	BH02
CLIENT	ProLogis Developments Limited	**DATE**	24/09/2003
METHOD	Cable Percussive	**PROJECT No**	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
			MADE GROUND: Turf over firm brown sandy clay. Occasional rootlets. Rare fine gravel sized fragments of flint.				B 0.50	B 001	
		1.00				29.92	B 1.00	B 002	
		1.40	Firm to stiff brown silty CLAY. Occasional orange and dark brown mottled sandy lenses. Rare angular fine to medium flint gravel (LANGLEY SILT).			29.52	B 1.40	B 003	N=15 (2,2,3,2,2,8)
▼			Dense to very dense gravelly medium grained orange SAND. Gravel is angular to rounded fine to coarse mixed lithology including sandstone and flint (LYNCH HILL GRAVELS).				B 2.50	B 004	N=69 (6,6,17,16,16,20)
							B 3.50	B 005	N=47 (4,4,10,10,12,15)
		4.50				26.42	B 4.50	B 006	N=31 (3,4,6,7,9,9)
		4.95	Firm brown CLAY. Rare medium grained sand and rare gravel sized fragments of angular medium flint (LONDON CLAY, WEATHERING GRADE E).			25.97	B 4.90 ◎ 5.00	B 007 U 001	
▼			Firm to stiff grey CLAY. Rare silty parting. Occasional grey very weak mudstone bands recovered as angular fine to medium gravel (LONDON CLAY, WEATHERING GRADE D).				◎ 6.00	U 002 B 008	

End of Borehole at 10.00 m

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

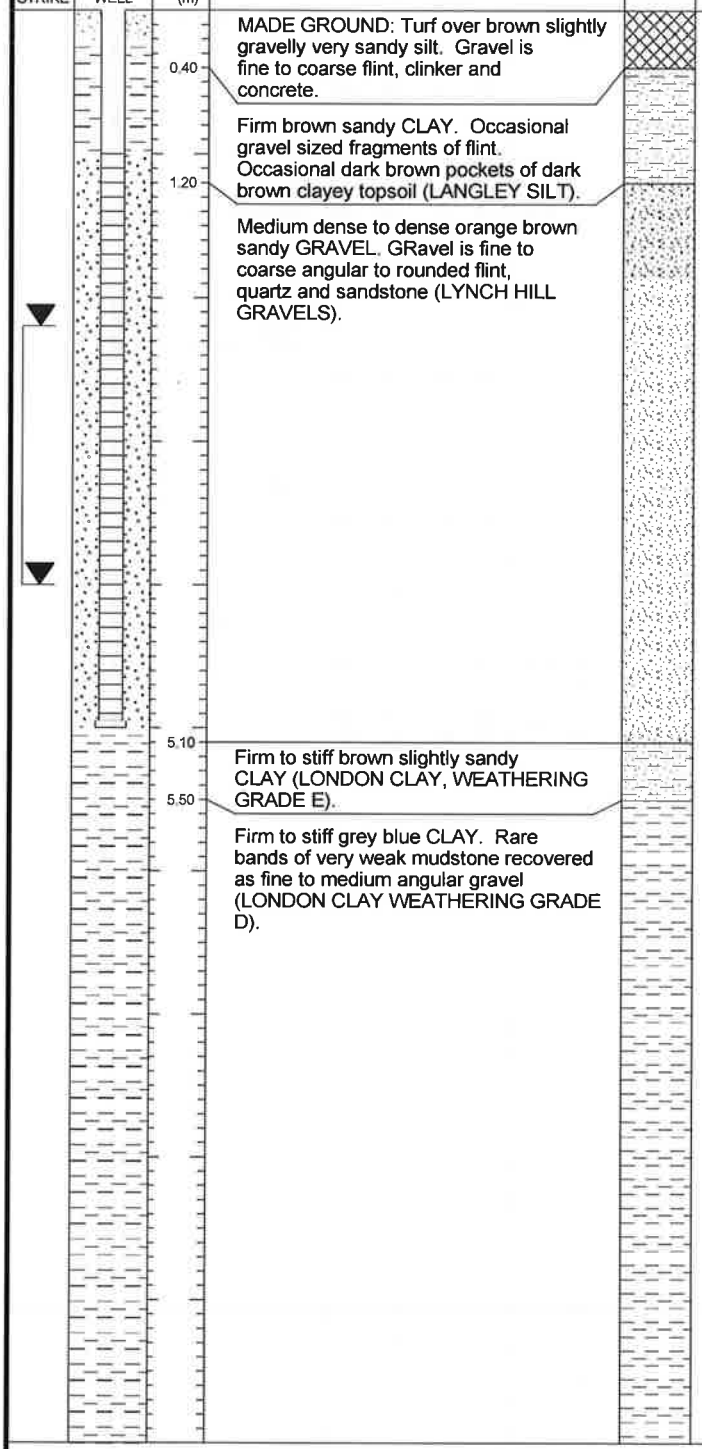
REMARKS

1. Groundwater encountered at 3.00mbgl stabilised at 2.20mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
508023.13	179307.11	30.918
LOGGED BY	**SCALE**	
KJS	1:50	Sheet 1 of 1

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	BH03
CLIENT	ProLogis Developments Limited	**DATE**	25/09/2003
METHOD	Cable Percussion	**PROJECT No**	12170423



DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
MADE GROUND: Turf over brown slightly gravelly very sandy silt. Gravel is fine to coarse flint, clinker and concrete.				B 0.00	B 001	
			31.31	JVT 0.35 B 0.40	JVT 012 B 002	
Firm brown sandy CLAY. Occasional gravel sized fragments of flint. Occasional dark brown pockets of dark brown clayey topsoil (LANGLEY SILT).				JVT 0.80	JVT 013	
			30.51	B 1.20	B 003	30/75mm - Abandoned
Medium dense to dense orange brown sandy GRAVEL. GRavel is fine to coarse angular to rounded flint, quartz and sandstone (LYNCH HILL GRAVELS).				B 2.30 JVT 2.40	B 004 JVT 014	N=76 (10,7,14,20,21,21)
				B 3.00	B 005	N=61 (5,5,14,16,16,15)
				B 4.50	B 006	N=38 (6,5,7,9,11,11)
				B 5.00	B 007	
Firm to stiff brown slightly sandy CLAY (LONDON CLAY, WEATHERING GRADE E).			26.61	JVT 5.20	JVT 015	N=26 (5,5,7,6,6,7)
			26.21	B 5.50	B 008	
Firm to stiff grey blue CLAY. Rare bands of very weak mudstone recovered as fine to medium angular gravel (LONDON CLAY WEATHERING GRADE D).				JVT 5.70	JVT 016	
				B 6.50	B 009	N=23 (3,3,4,6,6,7)
				B 8.00	B 010	N=24 (2,3,4,6,6,8)
				B 9.50	B 011	N=29 (3,4,6,7,8,8)

End of Borehole at 10.00 m

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
Water Strike
Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Driller unable to case water out of borehole.
2. Groundwater encountered at 4.00mbgl and stabilised at 2.60mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
507807.75	179438.13	31.711
LOGGED BY	SCALE	Sheet 1 of 1
KJS	1:50	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	BH04
CLIENT	ProLogis Developments Limited	**DATE**	26/09/2003
METHOD	Cable Percussion	**PROJECT No**	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
			MADE GROUND: Turf over medium dense brown silty sand. Occasional gravel sized fragments of flint, brick and concrete.				B 0.50 JVT 0.55	B 001 JVT 006	
		1.00	Dense to very dense sandy GRAVEL. Gravel is fine to coarse angular to rounded mixed lithology, predominantly flint (LYNCH HILL GRAVELS).			30.28	B 1.00 JVT 1.20	B 002 JVT 007	75/225mm (5,5,19,26,30)
		2.00	Soft grey very sandy CLAY bands (LYNCH HILL GRAVELS).			29.28	JVT 2.00	B 003 JVT 008	N=37 (4,4,8,8,11,10)
▼							B 2.80	B 004	N=29 (3,4,4,7,12,6)
▼		3.70	Firm brownish blue CLAY. Rare white calcium concretions (LONDON CLAY, WEATHERING GRADE E).			27.58	JVT 3.70	B 005 JVT 009	
		4.00	Firm to stiff grey CLAY (LONDON CLAY, WEATHERING GRADE D). At 9.00mbgl medium gravel sized lithorelics of mudstone.			27.28	4.00 JVT 4.20	D 004 JVT 010	N=13 (3,3,3,3,3,4)
							5.00 5.85	U 002	
							6.50 6.95	D 005 D 011	N=13 (3,3,3,3,3,4)
							8.00	U 003	
							8.45	D 006	
							9.50 9.95	D 007 D 012	N=22 (3,2,4,7,6,5)

End of Borehole at 10.00 m

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS

1. Groundwater encountered at 3.70mbgl stabilised at 3.00mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
508115.23	179529.58	31.276
LOGGED BY	SCALE	Sheet 1 of 1
KJS	1:50	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	BH05
CLIENT	ProLogis Developments Limited	DATE	26/09/2003
METHOD	Cable Percussion	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.20	MADE GROUND: Turf over sandy silty clay.			29.86			
		0.30	CONCRETE			29.76	B 0.30	B 002	
							JVT 0.50	JVT 001 002	
		0.80	MADE GROUND: Brown slightly gravelly silty sand. Gravel is flint, concrete, brick and broken asbestos cement sheeting.			29.26	B 0.80	B 003	
							JVT 1.00	JVT 003	N=25 (3,4,6,5,7,7)
▼		1.50	Firm brown silty CLAY with rare orange mottles. Occasional gravel sized fragments of flint (LANGLEY SILT).			28.56	B 1.50	B 004	
							JVT 1.75	JVT 004	
		2.00	Medium dense to dense brown slightly sandy GRAVEL (LYNCH HILL GRAVELS).			28.06	B 2.00	B 005	N=13 (2,2,3,3,4,3)
▼							JVT 2.30	JVT 005	
			Firm brown occasionally mottled grey CLAY (LONDON CLAY, WEATHERING GRADE E).				3.00	U 003	
							3.45	D 006	
							4.00	D 007	N=12 (2,3,3,3,3,3)
							5.00	U 004	
							5.45	D 008	
		6.50	Firm to stiff grey CLAY. Rare gravel sized fragments of mudstone lithorelics (LONDON CLAY, WEATHERING GRADE D).			23.56	6.50	D 009	N=14 (3,4,4,3,4,3)
							8.00	U 005	
							8.45	D 010	
							9.50	D 011	N=23 (4,4,4,6,6,7)

End of Borehole at 10.00 m

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

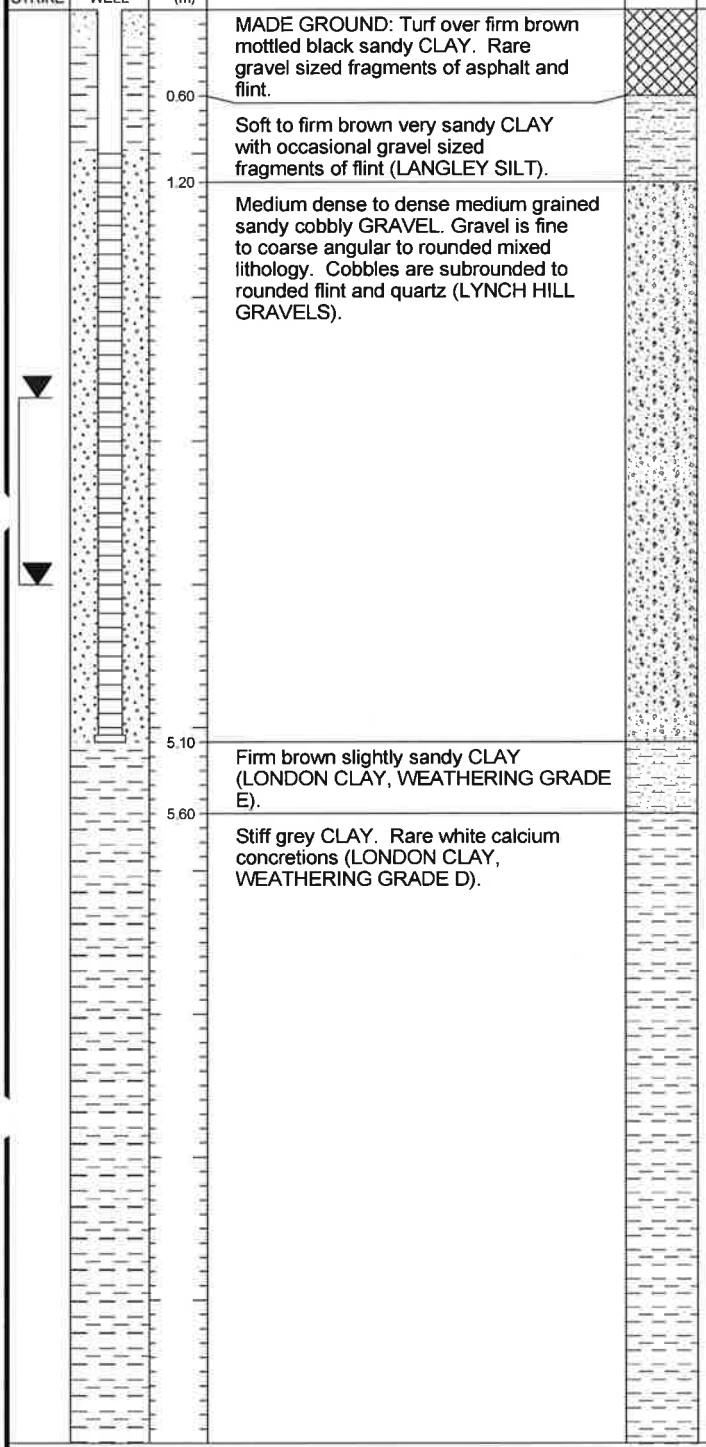
In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.00mbgl stabilised at 2.50mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
508117.67	179399.26	30.055
LOGGED BY	SCALE	Sheet 1 of 1
KJS	1:50	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	BH06
CLIENT	ProLogis Developments Limited	**DATE**	29/09/2003
METHOD	Shell and Auger Rig	**PROJECT No**	12170423



GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
			MADE GROUND: Turf over firm brown mottled black sandy CLAY. Rare gravel sized fragments of asphalt and flint.				B 0.30 JVT 0.50	B 004 JVT 001	
		0.60				30.94			
			Soft to firm brown very sandy CLAY with occasional gravel sized fragments of flint (LANGLEY SILT).				JVT 1.00	JVT 002	
		1.20				30.34	B 1.20	B 005	N=30 (2,2,8,8,7,7)
			Medium dense to dense medium grained sandy cobbly GRAVEL. Gravel is fine to coarse angular to rounded mixed lithology. Cobbles are subrounded to rounded flint and quartz (LYNCH HILL GRAVELS).				B 1.70	B 006	N=25 (3,3,5,6,7,7)
							B 2.70	B 007	N=25 (4,4,4,6,7,8)
							B 3.80	B 008	N=27 (5,5,5,6,8,8)
		5.10	Firm brown slightly sandy CLAY (LONDON CLAY, WEATHERING GRADE E).			26.44	B 5.00 B 5.10	B 009 B 010	N=13 (2,2,3,3,3,4)
		5.60	Stiff grey CLAY. Rare white calcium concretions (LONDON CLAY, WEATHERING GRADE D).			25.94	JVT 5.50 B 5.60	JVT 003 B 011	
							○ 6.50	D 012	N=15 (3,2,3,4,4,4)
							○ 8.00	D 013	N=18 (3,3,4,5,5,4)
							○ 9.50	D 014	N=24 (3,4,5,6,6,7)

End of Borehole at 10.00 m

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

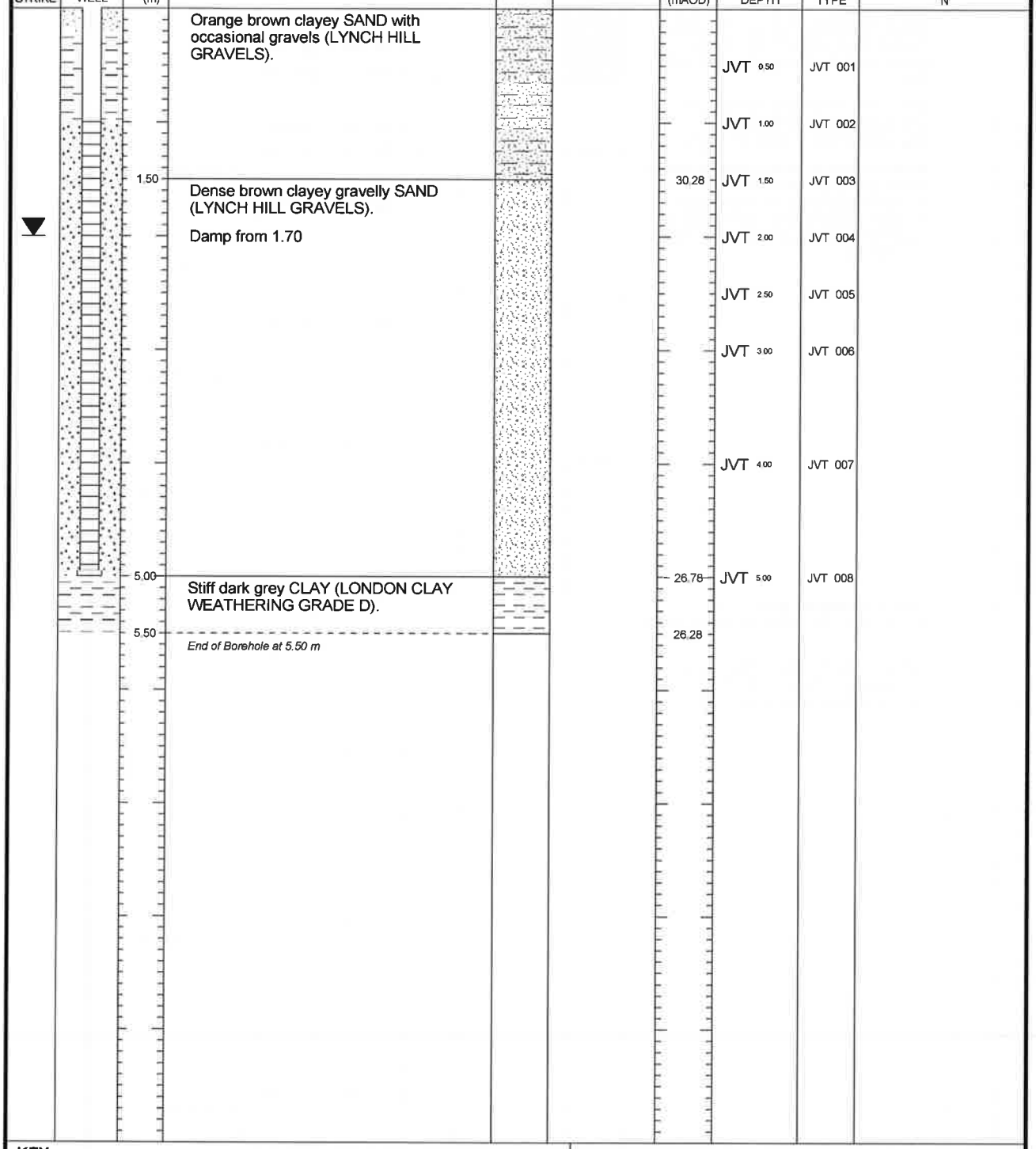
REMARKS

1. Groundwater encountered at 4.00mbgl stabilised at 2.90mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
507904.42	179434.70	31.537
LOGGED BY	**SCALE**	
KJS	1:50	Sheet 1 of 1

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	BH07
CLIENT	ProLogis Developments Limited	**DATE**	29/09/2003
METHOD	Solid Stem Auger Rig	**PROJECT No**	12170423



KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
Water Strike
Water Level

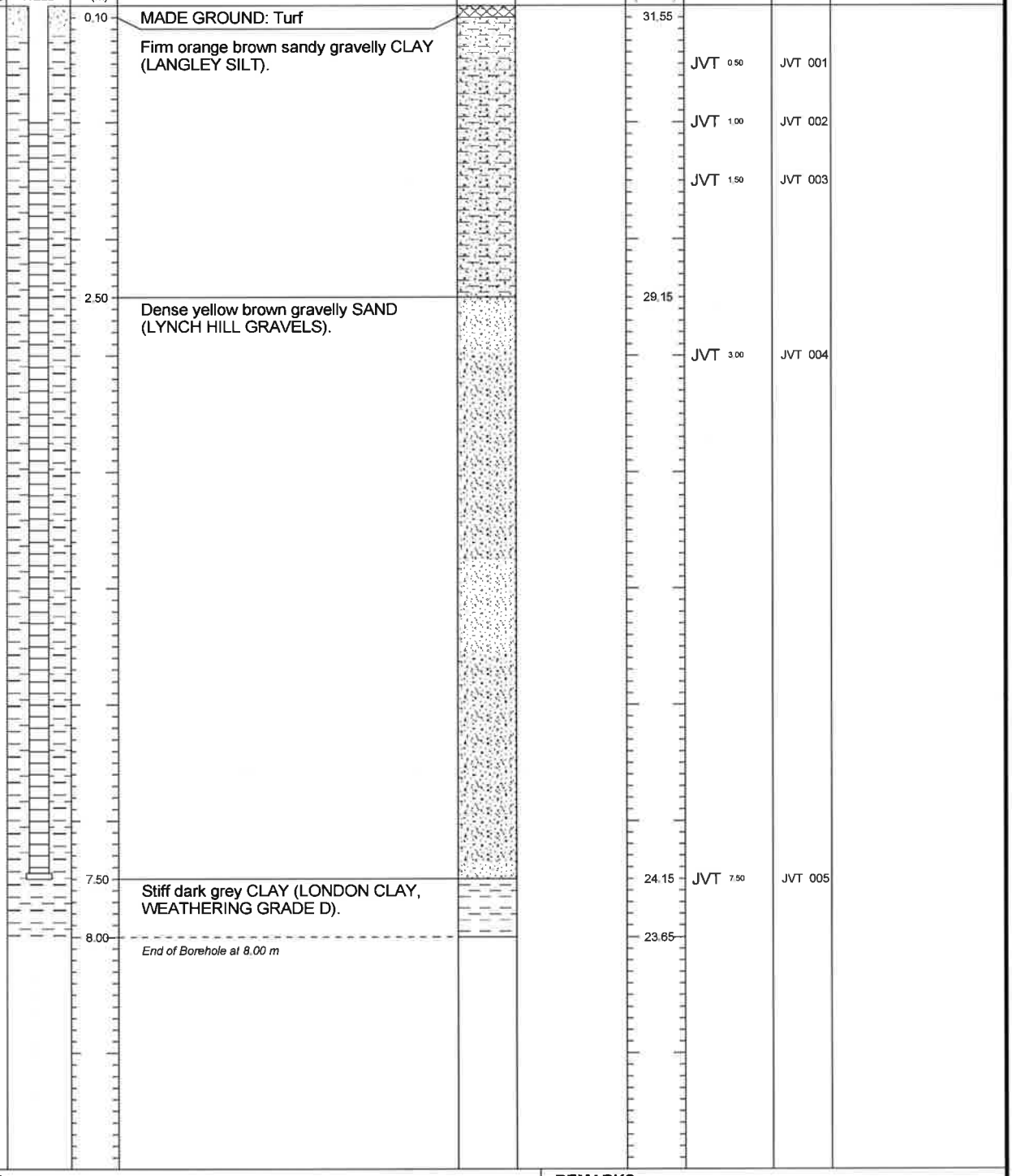
In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.00mbgl
2. Based on drillers description

EASTING	NORTHING	GROUND LEVEL (mAOD)
507874.10	179577.84	31.778
LOGGED BY	SCALE	Sheet 1 of 1
GRL	1:50	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	BH08
CLIENT	ProLogis Developments Limited	**DATE**	29/09/2003
METHOD	Solid Stem Auger Rig	**PROJECT No**	12170423



KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
Water Strike
Water Level

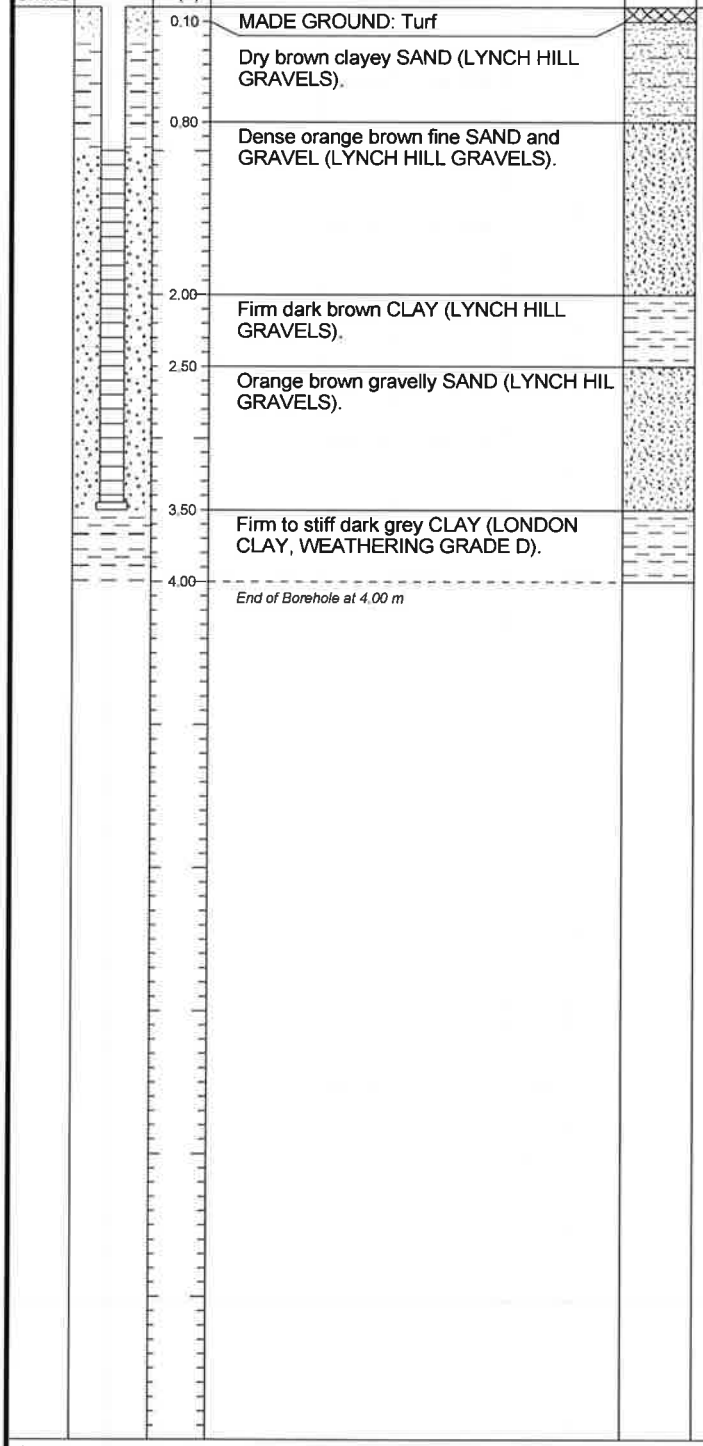
In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 3.00mbgl
2. Based on drillers description

EASTING	NORTHING	GROUND LEVEL (mAOD)
508031.70	179644.94	31.651
LOGGED BY	SCALE	Sheet 1 of 1
GRL	1:50	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	BH09
CLIENT	ProLogis Developments Limited	DATE	30/09/2003
METHOD	Solid Stem Auger Rig	PROJECT No	12170423



GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.10	MADE GROUND: Turf			31.48			
			Dry brown clayey SAND (LYNCH HILL GRAVELS).				JVT 0.50	JVT 001	
		0.80	Dense orange brown fine SAND and GRAVEL (LYNCH HILL GRAVELS).			30.78	JVT 1.00	JVT 002	
							JVT 1.50	JVT 003	
		2.00	Firm dark brown CLAY (LYNCH HILL GRAVELS).			29.58	JVT 2.00	JVT 004	
		2.50	Orange brown gravelly SAND (LYNCH HIL GRAVELS).			29.08			
							JVT 3.00	JVT 005	
		3.50	Firm to stiff dark grey CLAY (LONDON CLAY, WEATHERING GRADE D).			28.08			
		4.00	*End of Borehole at 4.00 m*			27.58	JVT 4.00	JVT 006	

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

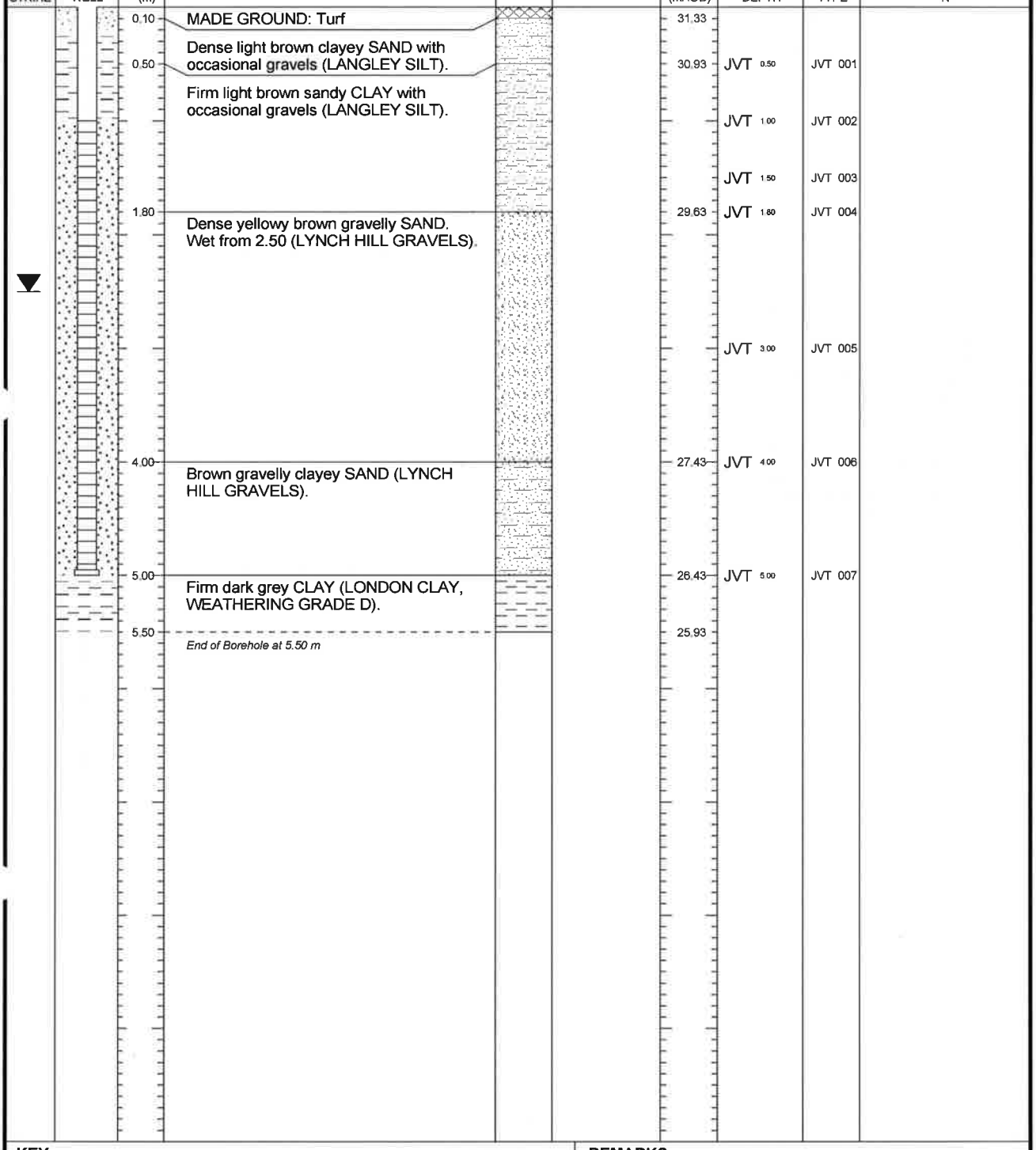
In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 1.75mbgl
2. Based on drillers description

EASTING	NORTHING	GROUND LEVEL (mAOD)
507989.35	179552.80	31.580
LOGGED BY	SCALE	
GRL	1:50	Sheet 1 of 1

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	BH10
CLIENT	ProLogis Developments Limited	**DATE**	30/09/2003
METHOD	Solid Stem Auger Rig	**PROJECT No**	12170423



KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.50mbgl
2. Based on drillers description

EASTING	NORTHING	GROUND LEVEL (mAOD)
507969.96	179352.88	31.432
LOGGED BY	SCALE	
GRL	1:50	Sheet 1 of 1

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP01
CLIENT	ProLogis Developments Limited	DATE	26/09/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over firm light brown slightly sandy slightly gravelly silty clay. Gravel is flint, ceramic, coal, metal and brick.				JVT 0.40	JVT 001	
					B 1.10	B 004	
1.30	Medium dense to dense orange brown slightly silty gravelly SAND. Gravel is mixed lithology including angular to rounded fine to coarse sand and flint (LYNCH HILL GRAVELS).			30.54	JVT 1.50	JVT 002	
1.90	MEdium dense to dense orange brown gravelly SAND. Gravel is angular to rounded fine to coarse mixed lithology including flint (LYNCH HILL GRAVELS)			29.94	B 2.50	B 005	
3.00	*End of Trial Pit at 3.15 m.*			28.84	JVT 3.10	B 002 JVT 003	

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
V - Vial

In-Site Tests:
VANE - In Situ Hand Shear Vane
ICBR - In Situ CBR
PP - Pocket penetrometer

REMARKS
1. Stability good
2. Groundwater encountered as slow seepage at 3.15mbgl
3. Trial pit terminated at 3.15mbgl due to refusal

EASTING	NORTHING	GROUND LEVEL (mAOD)
507787.06	179353.33	31.835
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	kjs

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP02
CLIENT	ProLogis Developments Limited	DATE	26/10/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over stiff brown silty sandy clay. Occasional gravel sized fragments of fine to medium angular flint. Rare gravel sized fragments of brick and ceramic.				JVT 0.80	B 001 JVT 002	
0.90	Stiff dark brown silty CLAY. Occasional gravel sized fragments of fine to medium angular flint (LANGLEY SILT).			30.92			
1.30	Stiff orange brown sandy CLAY. Occasional medium to coarse gravel sized fragments of subangular to rounded flint (LANGLEY SILT).			30.52	B 1.50	B 003	
1.75	Medium dense orange brown gravelly SAND. Gravel is a mixed lithology including angular to rounded fine to coarse flint (LYNCH HILL GRAVELS).			30.07			
3.00	*End of Trial Pit at 3.00 m.*			28.82	JVT 3.00	JVT 004	

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS

1. Groundwater encountered at 2.85mbgl
2. Side becoming unstable at 3.00mbgl - Trial pit terminated

EASTING	NORTHING	GROUND LEVEL (mAOD)
507769.29	179294.73	31.819
TRIAL PIT WIDTH	TRIAL PIT LENGTH	LOGGED BY
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP03
CLIENT	ProLogis Developments Limited	DATE	26/08/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Firm to stiff slightly silty clay. Occasional cobbles of brick.						
0.50	Firm to stiff dark brown silty CLAY (LANGLEY SILT).			31.75	JVT 0.60	JVT 001	
1.20	MEdium dense to dense orange brown Gravelly SAND. Gravel is angular to rounded fine to coarse flint. Occasional subrounded cobbles of flint (LYNCH HILL GRAVELS).			31.05	B 1.20	B 002	
					JVT 1.90	JVT 003	
					JVT 3.00	B 004 JVT 005	
3.40	*End of Trial Pit at 3.40 m.*			28.85			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
V - Vial

In-Site Tests:
VANE - In Situ Hand Shear Vane
ICBR - In Situ CBR
PP - Pocket penetrometer

REMARKS
1. Groundwater encountered at 3.35mbgl seepage
2. Side collapsing at 3.40mbgl - Trial pit terminated

EASTING	NORTHING	GROUND LEVEL (mAOD)
507833.61	179355.39	32.249
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**TRIAL PIT No**	TP04
CLIENT	ProLogis Developments Limited	**DATE**	26/09/2003
METHOD	JCB 3CX Mechanical Excavator	**PROJECT No**	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND Turf						
0.20				32.40			
	Turf over medium brown silty CLAY. Occasional angular fine to medium gravel sized fragments of flint (LANGLEY SILT).				JVT 0.50	JVT 001	
1.20				31.40			
	Loose orange brown slightly clayey silty SAND (LYNCH HILL GRAVELS).				JVT 1.50	B 002 JVT 003	
2.10				30.50			
	Medium dense clayey sandy GRAVEL. Gravel is angular to rounded fine to coarse mixed lithology including flint (lynch HILL GRAVELS).				B 2.50	B 004	
3.05				29.55			
	Loose orange brown slightly gravelly medium grained SAND (LYNCH HILL GRAVELS).						
3.60				29.00			
3.70	SAND and GRAVEL (LYNCH HILL GRAVELS).			28.90	JVT 3.70	B 005 JVT 006	
	End of Trial Pit at 3.70 m.						

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS
1. Moist at 2.20mbgl
2. Seepage at 3.05mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
507840.42	179313.81	32.604
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP05
CLIENT	ProLogis Developments Limited	DATE	26/09/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf.						
0.20	Firm friable brown silty CLAY. (LANGLEY SILT).			31.51			
					JVT 0.80	JVT 001	
1.20	Dense orange brown slightly clayey SAND. Occasional gravel sized fragments of fine to medium subangular to rounded flint (LYNCH HILL GRAVELS).			30.51			
1.40	Medium dense slightly clayey sandy GRAVEL. Gravel is angular to rounded fine to coarse flint and sandstone. Rare subrounded cobbles of flint (LYNCH HILL GRAVELS).			30.31	JBT 1.50	B 002 JVT 003	
2.90	Loose to medium dense orange brown medium grained SAND and angular to rounded fine to coarse flint GRAVEL (LYNCH HILL GRAVELS).			28.81			
3.10	*End of Trial Pit at 3.10 m.*			28.61	JBT 3.10	B 004 JVT 005	

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
V - Vial

In-Site Tests:
VANE - In Situ Hand Shear Vane
ICBR - In Situ CBR
PP - Pocket penetrometer

REMARKS
1. Groundwater encountered at 3.10mbgl
2. Trial pit terminated due to instability

EASTING	NORTHING	GROUND LEVEL (mAOD)
507927.03	179357.60	31.707
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP06
CLIENT	ProLogis Developments Limited	DATE	26/08/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf.						
0.20	Friable firm brown dry slightly sandy silty CLAY with some rootlets (LANGLEY SILT).			31.24	JVT 0.50	JVT 001	
1.45	Medium dense red brown medium to coarse sandy and fine to coarse subangular to rounded GRAVEL of predominantly flint and occasionally other lithologies (LYNCH HILL GRAVELS).			29.99	JVT 1.90	JVT 002	
					B 3.00	B 003	
3.65	*End of Trial Pit at 3.65 m.*			27.79			

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS
1. Trial pit stability was good.
2. Groundwater not encountered

EASTING	NORTHING	GROUND LEVEL (mAOD)
507950.00	179285.91	31.444
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	TD

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP07
CLIENT	ProLogis Developments Limited	DATE	26/09/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
0.20	MADE GROUND Turf over soft brown and grey silty sandy clayey topsoil with some rootlets.			30.79			
0.50	MADE GROUND: Friable firm light brown sandy silty thickly laminated clay with occasional gravels of stone. Occasional brick and wire fragments.			30.49	JVT 0.50	JVT 001	
1.00	Soft brown mottled grey and orange silty CLAY. Rare fine to coarse gravels of stone (LANGLEY SILT).			29.99			
	Medium dense orange brown medium to coarse grained sandy GRAVEL. Gravel is fine to coarse subangular to rounded predominantly flint with other lithologies (LYNCH HILL GRAVELS).				B 2.00	B 002	
2.70	*End of Trial Pit at 2.70 m.*			28.29			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
V - Vial

In-Site Tests:
VANE - In Situ Hand Shear Vane
ICBR - In Situ CBR
PP - Pocket penetrometer

REMARKS

1. Stability poor from 2.40mbgl, trial pit terminated at 2.70mbgl
2. Groundwater encountered at 2.65mbgl.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508000.54	179311.21	30.987
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	TD

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP08
CLIENT	ProLogis Developments Limited	DATE	26/09/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
0.20	MADE GROUND: Soft light brown grey silty sandy clayey topsoil with some rootlets.			31.04			
	Friable soft to firm light brown silty CLAY with some rootlets (associated with adjacent tree) (LANGLEY SILT).				JVT 0.50	JVT 001	
					B 1.00	B 002	
1.50	Medium dense red brown medium to coarse grained sandy GRAVEL. Gravel is subangular to rounded flint with occasional other lithologies (LYNCH HILL GRAVELS).			29.74			
	Colour change of strata to brown below water table.				JVT 2.00	JVT 003	
3.30	*End of Trial Pit at 3.30 m.*			27.94			

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS
1. Stability OK
2. Groundwater encountered at 3.15mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
508003.76	179287.72	31.243
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	TD

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**TRIAL PIT No**	TP09
CLIENT	ProLogis Developments Limited	**DATE**	26/09/2003
METHOD	JCB 3CX Mechanical Excavator	**PROJECT No**	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over firm friable light brown gravelly silty reworked clay with occasional brick fragments, metal springs and coarse flint.				JVT 0.50	JVT 001	
1.20	Soft grey mottled orange CLAY with occasional fine gravels of stone (LANGLEY SILT).			29.48	JVT 1.50	JVT 002	
1.80	Loose to medium dense grey clayey medium to coarse grained sandy GRAVEL. Gravel is subangular to rounded flint, with occasional cobbles of flint and pockets of clay (LYNCH HILL GRAVELS).			28.88			
2.20	Soft to firm blue grey mottled orange CLAY with occasional rootlet relics(LONDON CLAY, WEATHERING GRADE E).			28.48	B 2.40 JVT 2.50	B 003 JVT 004	
3.50	*End of Trial Pit at 3.50 m.*			27.18			

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS
1. Stability OK
2. Groundwater not encountered
3. Hand Shear Vane at 2.40mbgl 30, 28, 34

EASTING	NORTHING	GROUND LEVEL (mAOD)
508102.23	179330.14	30.677
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	TD

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**TRIAL PIT No**	TP10
CLIENT	ProLogis Developments Limited	**DATE**	26/09/2003
METHOD	JCB 3CX Mechanical Excavator	**PROJECT No**	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over firm friable light orange and brown gravelly silty clay. Gravel is stone and occasional flint.				JVT 0.50 B 0.60	JVT 001 B 002	
0.80	Medium dense orange brown silty gravelly medium to coarse grained SAND with occasional clayey pockets. Gravel is subangular to round flint with other mixed lithologies (LYNCH HILL GRAVELS).			30.47			
1.60	Loose to medium dense medium to coarse grained sandy GRAVEL. Gravel is subangular to rounded fine to coarse flint (LYNCH HILL GRAVELS).			29.67	JVT 1.70 B 1.80	JVT 003 B 004	
2.50	Soft to stiff brown CLAY. Occasional subangular to rounded fine to medium gravel fragments of flint (LONDON CLAY WEATHERING GRADE E). Becoming blue grey at 3.40mbgl.			28.77	JVT 2.70	B 005 JVT 006	
3.40	*End of Trial Pit at 3.40 m.*			27.87			

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS

1. Groundwater encountered at 2.30mbgl - slow seepage
2. Hand shear vane at 2.50 100, 90, 8
80HSV at 63.10 110, 84, 110.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507968.73	179531.43	31.267
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**TRIAL PIT No**	TP11
CLIENT	ProLogis Developments Limited	**DATE**	27/09/2003
METHOD	JCB 3CX Mechanical Excavator	**PROJECT No**	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over firm brown silty CLAY with occasional gravel and cobbles of brick and broken drain.				JVT 0.50	JVT 001	
0.70	Dense red brown slightly silty medium to coarse grained sandy GRAVEL. Gravel is angular to rounded fine to coarse flint (LYNCH HILL GRAVELS). Occasional clayey pockets with some organic matter staining at 1.70mbgl.			30.75			
1.70	Medium dense red brown sandy GRAVEL. Gravel is subangular to rounded fine to coarse flint (LYNCH HILL GRAVELS).			29.75	JBT 1.70	B 002 JVT 003	
2.40				29.05			
2.50	Soft to firm orange mottled grey slightly sandy CLAY (LONDON CLAY WEATHERING GRADE E).			28.95	JBT 2.45	JVT 004 B 005	
	Soft to firm orange brown sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse flint (from previous horizon) (LONDON CLAY WEATHERING GRADE E).				JBT 3.00	B 006 JVT 007	
3.70				27.75			
3.80	Orange brown CLAY with occasional medium subangular to rounded gravel sized fragments of mudstone (LONDON CLAY WEATHERING GRADE E).			27.65			
	End of Trial Pit at 3.80 m.						

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
V - Vial

In-Site Tests:
VANE - In Situ Hand Shear Vane
ICBR - In Situ CBR
PP - Pocket penetrometer

REMARKS
1. Groundwater encountered at 1.80mbgl as slow seepage
2. Sides unstable, trial pit terminated at 3.80mbgl

EASTING	NORTHING	GROUND LEVEL (mAOD)
508118.80	179543.64	31.446
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**TRIAL PIT No**	TP12
CLIENT	ProLogis Developments Limited	**DATE**	27/09/2003
METHOD	JCB 3CX Mechanical Excavator	**PROJECT No**	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over fill comprising brick, wood, metal, asbestos sheets, cables, breeze blocks, plastic sheeting, reinforced glass, concrete and paving slabs.				JVT 0.50	JVT 001	
1.50	Soft grey mottled black and orange slightly silty CLAY. Occasional rare gravel sized fragments of flint. Organic matter staining and odour (LANGLEY SILT).			29.33	JVT 1.60 B 1.70	JVT 002 B 003	
2.40	Loose to medium dense wet grey brown gravelly medium to coarse grained SAND. Gravel is subangular to rounded fine to coarse flint (LYNCH HILL GRAVELS).			28.43	JVT 2.50	JVT 004	
2.80	Firm brown CLAY with rare gravel sized fragments of very weak mudstone (LONDON CLAY WEATHERING GRADE E). Becoming grey at 3.70mbgl.			28.03	JVT 2.90	B 005 JVT 006	
3.80	*End of Trial Pit at 3.80 m.*			27.03			

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS
1. Trial pit terminated at 3.80mbgl side above unstable
2. Hand shear vane at 2.90mbgl 60, 48, 44, 52
3. Groundwater not encountered

EASTING	NORTHING	GROUND LEVEL (mAOD)
508113.35	179516.22	30.825
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP13
CLIENT	ProLogis Developments Limited	DATE	27/09/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf.						
0.20	Firm friable brown silty CLAY. Occasional subangular to rounded fine to coarse gravel sized fragments of flint and stone (LANGLEY SILT). Becoming gravelly from 0.70mbgl			30.66	JVT 0.50	B 001 JVT 002	
0.90	Medium dense to dense orange brown and yellow medium to coarse grained sandy GRAVEL. Gravel is subangular to rounded fine to coarse flint (LYNCH HILL GRAVELS). From 1.20 to 1.70 dark cemented horizons containing sand, gravel and rootlets.			29.96	JVT 1.20	B 003 JVT 004	
2.10	Medium dense red brown medium to coarse grained sandy GRAVEL. Gravel is subangular to rounded fine to coarse flint (LYNCH HILL GRAVELS).			28.76			
3.10	Soft to firm yellow mottled grey slightly gravely sandy CLAY. Gravel is subangular to rounded, fine to coarse flint (LONDON CLAY WEATHERING GRADE F).			27.76			
3.40	Firm to stiff blue grey CLAY with thin laminations every 10cm of orange fine to medium grained sand (LONDON CLAY WEATHERING GRADE E).			27.46			
3.70	*End of Trial Pit at 3.70 m.*			27.16	B 3.65	B 005	

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
V - Vial

In-Site Tests:
VANE - In Situ Hand Shear Vane
ICBR - In Situ CBR
PP - Pocket penetrometer

REMARKS
1. Trial pit terminated at 3.70mbgl as sides above unstable.
2. Groundwater encountered at 3.00mbgl.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508105.69	179473.22	30.855
TRIAL PIT WIDTH	TRIAL PIT LENGTH	LOGGED BY
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	TRIAL PIT No	TP14
CLIENT	ProLogis Developments Limited	DATE	27/09/2003
METHOD	JCB 3CX Mechanical Excavator	PROJECT No	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over firm friable brown silty clay with occasional gravel sized fragments of subangular to rounded flint. Thin dense black clinker horizon from 0.30 - 0.50mbgl.				JVT 0.50	B 001 JVT 002	
0.70	Medium dense to dense gravelly medium to coarse grained SAND. Gravel is subangular to rounded fine to coarse flint (LYNCH HILL GRAVELS). Medium grained red sand band from 1.60 - 1.70mbgl			30.70	JVT 1.20	JVT 003	
					JVT 1.50	JVT 004	
2.60	*End of Trial Pit at 2.60 m.*			28.80			

KEY

Sample Types:
- U - Undisturbed
- D - Disturbed
- B - Bulk
- W - Water
- V - Vial

In-Site Tests:
- VANE - In Situ Hand Shear Vane
- ICBR - In Situ CBR
- PP - Pocket penetrometer

REMARKS
1. Trial pit terminated at 2.60mbgl sides unstable
2. Groundwater encountered at 2.30mbgl as fast seepage.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507852.08	179445.88	31.397
TRIAL PIT WIDTH	TRIAL PIT LENGTH	LOGGED BY
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**TRIAL PIT No**	TP15
CLIENT	ProLogis Developments Limited	**DATE**	27/09/2003
METHOD	JCB 3CX Mechanical Excavator	**PROJECT No**	12170423

DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL m(AOD)	SAMPLES DEPTH	SAMPLES TYPE	TEST RESULTS
	MADE GROUND: Turf over reworked firm brown silty clay. Occasional fine to medium gravel of stone.				JVT 0.50	B 001 JVT 002	
0.60	Firm brown silty CLAY. Rare gravels of stone.			31.44			
1.50				30.54			
1.60	Medium dense to dense red brown gravelly medium to coarse grained SAND. Gravel is subangular to rounded fine to coarse flint.			30.44	JVT 1.70	JVT 003	
1.80	Medium dense red brown medium grained SAND.			30.24			
	End of Trial Pit at 1.80 m.						

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
V - Vial

In-Site Tests:
VANE - In Situ Hand Shear Vane
ICBR - In Situ CBR
PP - Pocket penetrometer

REMARKS
1. Groundwater not encountered

EASTING	NORTHING	GROUND LEVEL (mAOD)
507940.35	179382.40	32.038
TRIAL PIT WIDTH	**TRIAL PIT LENGTH**	**LOGGED BY**
-	-	KJS

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS01
CLIENT	ProLogis Developments Limited	DATE	29/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
			MADE GROUND: Turf over loose brown silty topsoil with frequent rootlets.						
		0.20	MADE GROUND: Friable stiff yellow brown silty reworked clay with occasional fine gravel of flint.			31.55	0.40 JVT 0.60	JVT 001	
		0.75	MADE GROUND: Dense white compacted sandy gravel of flint.			31.00			
		0.90	*End of Borehole at 0.90 m*			30.85			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
Water Strike
Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater not encountered.
2. WS terminated at 0.9mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
504040.96	179638.98	31.750
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS02
CLIENT	ProLogis Developments Limited	DATE	29/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.20	MADE GROUND: Loose brown silty topsoil with frequent rootlets.			31.47			
			MADE GROUND: Medium dense light grey brown silty medium to coarse subangular to angular gravel of flint.				0.50 JVT 0.80	JVT 001	
		1.50	Soft orange brown mottled grey silty gravelly CLAY. Gravel is fine to medium subangular to subrounded flint and stone. (LANGLEY SILT).			30.17	1.60 JVT 1.80	JVT 002	
▼		1.80	Loose to medium dense orange brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).			29.87			
		2.10	*End of Borehole at 2.10 m*			29.57			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.1mbgl.
2. WS terminated at 2.1mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508088.51	179610.87	31.670
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	WS03
CLIENT	ProLogis Developments Limited	**DATE**	29/09/2003
METHOD	Archway Competitor Window Sample Rig	**PROJECT No**	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
			MADE GROUND: Loose grey brown silty topsoil with frequent rootlets.						
		0.25				30.52			
			Soft to firm orange mottled light grey gravelly silty CLAY. Gravel is medium to coarse subangular to angular flint.				0.75 JVT 0.90	JVT 001	
		1.20				29.57			
			Loose to medium dense orange brown medium to coarse sandy fine to coarse angular to subangular GRAVEL of flint. (LYNCH HILL GRAVEL).				1.50 JVT 1.80	JVT 002	
▼		1.90	*End of Borehole at 1.90 m*			28.87			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 1.9mbgl.
2. WS terminated at 1.9mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508046.01	179430.81	30.770
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	WS04
CLIENT	ProLogis Developments Limited	**DATE**	29/09/2003
METHOD	Archway Competitor Window Sample Rig.	**PROJECT No**	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.15	MADE GROUND: Tarmacadam hard standing.			30.74			
			MADE GROUND: Loose to medium dense gravel of cement and concrete.						
		0.50	MADE GROUND: Dense red brick rubble layer.			30.39	0.50 JVT	JVT 001	
		0.70	Soft becoming firm brown mottled light grey and black gravelly CLAY. Gravel is medium to coarse subangular to angular stone and flint.. (LANGLEY SILT).			30.19	0.70		
							1.80 JVT	JVT 002	
							2.00		
▼		2.20	Medium dense orange brown medium to coarse sandy fine to medium subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).			28.69			
							2.90 JVT	JVT 003	
		3.10	*End of Borehole at 3.10 m*			27.79	3.10		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.5mbgl.
2. WS terminated at 3.1mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508053.47	179449.58	30.890
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	WS05
CLIENT	ProLogis Developments Limited	**DATE**	29/09/2003
METHOD	Archway Competitor Window Sample Rig	**PROJECT No**	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.20	MADE GROUND: Loose light brown silty topsoil with some gravel of stone and rootlets.			29.90	0.20		
			MADE GROUND: Medium dense grey pink brick rubble layer with pockets of clay.				JVT	JVT 001	
		0.50	Firm grey mottled orange silty CLAY with occasional thick bands of gravel of flint. (LANGLEY SILT).			29.60	0.50		
▼		1.50	Medium dense orange brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).			28.60	2.00		
							JVT	JVT 002	
		2.50	Firm grey mottled brown CLAY. (LONDON CLAY).			27.60	2.50		
							3.80		
							JVT	JVT 003	
		4.00	*End of Borehole at 4.00 m*			26.10	4.00		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.0mbgl.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508113.53	179387.11	30.100
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	WS06
CLIENT	ProLogis Developments Limited	**DATE**	29/09/2003
METHOD	Archway Competitor Window Sample Rig	**PROJECT No**	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.10	MADE GROUND: Loose grey brown silty topsoil with some rootlets.			30.30			
		0.30	MADE GROUND: Dense pink brick rubble layer.			30.10			
		0.60	Firm grey mottled orange silty CLAY with occasional fine gravel of flint. (LANGLEY SILT).			29.80	0.60		
			Loose to medium dense grey brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).				JVT	JVT 001	
			End of Borehole at 1.40 m				1.00		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
Water Strike
Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater not encountered.
2. WS terminated at 1.4mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508107.28	179435.18	30.400
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS07
CLIENT	ProLogis Developments Limited	DATE	29/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.10	MADE GROUND: Loose light brown silty topsoil with some rootlets.			30.37	0.10		
			MADE GROUND: Loose grey gravel of stone and ash.				JVT	JVT 001	
		0.40	Soft to firm grey mottled orange and red silty CLAY. (LANGLEY SILT).			30.07	0.40		
		1.00	Medium dense orange brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).			29.47	1.50		
▼							JVT	JVT 002	
		2.00	Firm brown mottled grey CLAY. (LONDON CLAY).			28.47	2.00		
							3.80		
							JVT	JVT 003	
		4.00	*End of Borehole at 4.00 m*			26.47	4.00		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.0mbgl.

EASTING	NORTHING	GROUND LEVEL (mAOD)
508102.22	179418.30	30.470
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS08
CLIENT	ProLogis Developments Limited	DATE	30/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.10	MADE GROUND: Loose grey brown silty topsoil with some rootlets.			31.59	0.10		
		0.25	MADE GROUND: Loose black gravel of ash and clinker.			31.44	JVT	JVT 001	
		0.50	MADE GROUND: Medium dense pink brown brick rubble layer.			31.19	0.50		
		0.65	Firm brown silty CLAY. (LANGLEY SILT).			31.04			
		1.00	Firm orange brown gravelly sandy CLAY. Gravel is fine to coarse subangular to angular flint. (LANGLEY SILT).			30.69			
			Medium dense brown sandy CLAY. (LANGLEY SILT).						
▼		1.60	Medium dense brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).			30.09			
							2.40		
							JVT	JVT 002	
		2.60	*End of Borehole at 2.60 m*			29.09	2.60		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.0mbgl.
2. WS terminated at 2.6mbgl due to refusal.
3. Slight hydrocarbon odour and staining at 2.4 - 2.6mbgl.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507894.69	179615.24	31.690
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	**BOREHOLE No**	WS09
CLIENT	ProLogis Developments Limited	**DATE**	30/09/2003
METHOD	Archway Competitor Window Sample Rig	**PROJECT No**	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.10	MADE GROUND: Loose brown silty topsoil with some rootlets.			31.16	0.10 JVT	JVT 001	
		0.25	MADE GROUND: Loose brown sandy gravel of brick, concrete and ash.			31.01	0.25		
			Soft to firm brown mottled orange gravelly silty CLAY. Gravel is fine to medium subangular to subrounded flint. (LANGLEY SILT).						
		1.00	Loose to medium dense orange brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint and stone. (LYNCH HILL GRAVEL)			30.26	1.80 JVT	JVT 002	
		2.00	*End of Borehole at 2.00 m*			29.26	2.00		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater not encountered.
2. WS terminated at 2.0mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507977.20	179360.80	31.260
LOGGED BY	**SCALE**	
TD	1:25	Sheet 1 of 1

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS10
CLIENT	ProLogis Developments Limited	DATE	30/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.10	MADE GROUND: Loose grey brown silty topsoil with some rootlets.			31.21			
			Friable stiff orange brown silty CLAY with occasional fine gravel of flint. (LANGLEY SILT).				0.80 JVT	JVT 001	
		1.00	Medium dense white brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).			30.31	1.00		
		1.75	Medium dense to dense yellow brown gravelly coarse SAND. Gravel is fine to medium subangular to angular flint. (LYNCH HILL GRAVEL).			29.56			
▼							2.80 JVT	JVT 002	
		3.00	*End of Borehole at 3.00 m*			28.31	3.00		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.9mbgl.
2. WS terminated at 3.0mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507986.63	179377.68	31.310
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS11
CLIENT	ProLogis Developments Limited	DATE	30/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
			MADE GROUND: Concrete hard standing.						
		0.30	Soft to firm brown silty CLAY. (LANGLEY SILT).			31.10	JVT 0.50 0.80	JVT 001	
		2.00	Medium dense yellow brown medium to coarse sandy fine to coarse subangular to angular GRAVEL of flint. (LYNCH HILL GRAVEL).			29.40	JVT 2.80 3.00	JVT 002	
		3.00	*End of Borehole at 3.00 m*			28.40			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
Water Strike
Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater not encountered.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507963.49	179366.45	31.400
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS12
CLIENT	ProLogis Developments Limited	DATE	30/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.10	MADE GROUND: Loose grey brown silty topsoil with frequent rootlets.			31.54			
			Friable firm yellow brown silty CLAY. (LANGLEY SILT).				0.80		
		0.90				30.74	JVT	JVT 001	
			Medium dense orange brown clayey fine to coarse subangular to angular GRAVEL of flint with occasional thin sand bands. (LANGLEY SILT).				1.00		
		1.50				30.14			
▼			Loose to medium dense brown slightly gravelly medium to coarse SAND. Gravel is medium subangular to subrounded flint and stone. (LYNCH HILL GRAVEL).				2.50		
							JVT	JVT 002	
		3.00	*End of Borehole at 3.00 m*			28.64	3.00		

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater encountered at 2.5mbgl.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507928.45	179420.19	31.640
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS13
CLIENT	ProLogis Developments Limited	DATE	30/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.20	MADE GROUND: Loose brown gravelly sandy silty topsoil with some rootlets.			31.23	0.20		
			Soft to firm brown gravelly CLAY. Gravel is medium to coarse subangular to angular flint. (LANGLEY SILT).				JVT 0.50	JVT 001	
		1.00				30.43			
			Loose to medium dense yellow brown slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded flint. (LYNCH HILL GRAVEL).				2.00 JVT 2.20	JVT 002	
		2.20	*End of Borehole at 2.20 m*			29.23			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater not encountered.
2. WS terminated at 2.2mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507924.08	179424.56	31.430
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

PROJECT	MOD Records Office, Hayes.	BOREHOLE No	WS14
CLIENT	ProLogis Developments Limited	DATE	30/09/2003
METHOD	Archway Competitor Window Sample Rig	PROJECT No	12170423

GROUNDWATER STRIKE	GROUNDWATER WELL	DEPTH (m)	DESCRIPTION	LEGEND	DEPTH RELATED REMARKS	LEVEL (mAOD)	SAMPLES DEPTH	SAMPLES TYPE	SPT 'N'
		0.20	MADE GROUND: Loose brown gravelly sandy silty topsoil with some rootlets.			32.32			
			Friable firm brown occasionally mottled black silty CLAY with rare medium gravel of stone and flint. (LANGLEY SILT).				0.50 JVT 0.70	JVT 001	
		1.00				31.52			
			Medium dense yellow brown medium sandy fine to coarse subangular to subrounded GRAVEL of flint. (LYNCH HILL GRAVEL).						
		1.30				31.22			
			Medium dense orange brown medium SAND with rare coarse subangular gravel of flint.				2.80 JVT 3.00	JVT 002	
		3.00	*End of Borehole at 3.00 m*			29.52			

KEY

Sample Types:
U - Undisturbed
D - Disturbed
B - Bulk
W - Water
T - Tub
J - Amber Jar
V - Vial

Water Levels:
▼ Water Strike
▼ Water Level

In Situ Tests:
C - CPT
S - SPT

REMARKS
1. Groundwater not encountered.
2. WS terminated at 3.0mbgl due to refusal.

EASTING	NORTHING	GROUND LEVEL (mAOD)
507904.71	179617.12	32.520
LOGGED BY	SCALE	Sheet 1 of 1
TD	1:25	

WSP ENVIRONMENTAL

Appendix D

Gas and Groundwater Monitoring Data

GAS MONITORING RECORD SHEET

WSP ENVIRONMENTAL

Site :	MOD Hayes	**Ground Conditions :**	Wet		
Job No :	.12170437.	**Weather :**	Wet with sunny spells		
Date :	07.10.03	**Pressure :**	High		
Instrumentation :					
Gas Data LMSx		**Start :**	1004	**mb at**	
Electric Contact Dip Meter		**Finish :**	1004	**mb at**	

Hole :	BH1	**Flow :**	0.4	**l/hr**	**Hole :**	BH2	**Flow :**	0.2-0.5	**l/hr**
MP State :	OK	**R of C :**	Steady		**MP State :**	OK	**R of C :**	Steady	
SWL :	2.14	**MP Depth :**	4.5	**m**	**SWL :**	2	**MP Depth :**	4.07	**m**
Sample :	Water	**BG O_2 :**	20.3	**% v/v**	**Sample :**	Water	**BG O_2 :**	20.7	**% v/v**

Time (secs)	**LEL (%)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**Time (secs)**	**LEL (%)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**
30	<0.1	<0.1	<0.1	19.9	**30**	<0.1	<0.1	<0.1	19.7
60	<0.1	<0.1	0.1	19.8	**60**	<0.1	<0.1	<0.1	20.1
90	<0.1	>>	0.4	19.7	**90**	<0.1	<0.1	<0.1	20.3

Hole :	BH3	**Flow :**	0	**l/hr**	**Hole :**	BH4	**Flow :**	0.1-0.5	**l/hr**
MP State :	OK	**R of C :**			**MP State :**	OK	**R of C :**	Steady	
SWL :	2.34	**MP Depth :**	5.8	**m**	**SWL :**	1.56	**MP Depth :**		**m**
Sample :	Water	**BG O_2 :**	21.1	**% v/v**	**Sample :**	Water	**BG O_2 :**	20.7	**% v/v**

Time (secs)	**LEL (%)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**Time (secs)**	**LEL (%)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**
30	<0.1	<0.1	<0.1	20.3	**30**	<0.1	<0.1	<0.1	20.4
60	<0.1	<0.1	<0.1	20.3	**60**	<0.1	<0.1	<0.1	20.3
90	<0.1	<0.1	<0.1	20.3	**90**	<0.1	<0.1	<0.1	20.2

Hole :	BH5	**Flow :**	1	**l/hr**	**Hole :**	BH6	**Flow :**	0.2-0.7	**l/hr**
MP State :	OK	**R of C :**	Steady		**MP State :**	OK	**R of C :**	Steady	
SWL :	1.96	**MP Depth :**	2.07	**m**	**SWL :**	2.31	**MP Depth :**	5.3	**m**
Sample :	No	**BG O_2 :**	20.7	**% v/v**	**Sample :**	Y	**BG O_2 :**	20.7	**% v/v**

Time (secs)	**LEL (%)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**Time (secs)**	**LEL (%)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**
30	<0.1	<0.1	<0.1	19.8	**30**	<0.1	<0.1	<0.1	20.3
60	<0.1	<0.1	<0.1	20.2	**60**	<0.1	<0.1	<0.1	20.2
90	<0.1	<0.1	<0.1	20.1	**90**	<0.1	<0.1	<0.1	20.2

NOTES :

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Operator : _____

GAS MONITORING RECORD SHEET

WSP ENVIRONMENTAL

Site : MOD Hayes	**Ground Conditions :** Wet
Job No : 12170437	**Weather :** Wet with sunny spells
Date : 07.10.03	**Pressure :**
Instrumentation :	
GA 94 Infra Red Gas Analyser	**Start :** 1002 **mb at**
Flow Pod and Electric Contact Dip Meter	**Finish :** 1002 **mb at**

Hole :	BH7	**Flow :**	1.1 - -1.0	l/hr
MP State :	OK	**R of C :**	-	
SWL :	1.51	**MP Depth :**		m
Sample :	No	**BG O_2 :**	20.7	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	0.1	18.8
60	<0.1	<0.1	0.3	18.3
90	<0.1	<0.1	0.5	17

Hole :	BH8	**Flow :**	0	l/hr
MP State :	OK	**R of C :**		
SWL :	1.64	**MP Depth :**	7.13	m
Sample :	No	**BG O_2 :**	20.7	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	20.2
60	<0.1	<0.1	<0.1	20.1
90	0.4	<0.1	<0.1	20

Hole :	BH9	**Flow :**	0	l/hr
MP State :	OK	**R of C :**		
SWL :	1.53	**MP Depth :**		m
Sample :	No	**BG O_2 :**	20.7	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	19.4
60	<0.1	<0.1	<0.1	20.3
90	<0.1	<0.1	<0.1	20.6

Hole :	BH10	**Flow :**	0	l/hr
MP State :	OK	**R of C :**		
SWL :	2.39	**MP Depth :**		m
Sample :	No	**BG O_2 :**		% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30				
60				
90				

Hole :	BH15	**Flow :**	0	l/hr
MP State :	ok	**R of C :**		
SWL :	2.21	**MP Depth :**	5.37	m
Sample :	Yes	**BG O_2 :**	20.7	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	0.2	20
60	<0.1	<0.1	0.2	20
90	<0.1	<0.1	0.2	20

Hole :		**Flow :**		l/hr
MP State :		**R of C :**		
SWL :		**MP Depth :**		m
Sample :		**BG O_2 :**		% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30				
60				
90				

NOTES :

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Operator : _____

GAS MONITORING RECORD SHEET

WSP ENVIRONMENTAL

Site :	MOD Hayes	**Ground Conditions :**	Damp
Job No :	12170437	**Weather :**	Sunny
Date :	14.10.03	**Pressure :**	High
Instrumentation :			
Gas Data LMSx		**Start :**	1018 **mb at**
Electric Contact Dip Meter		**Finish :**	1021 **mb at**

Hole :	BH1	**Flow :**	<0.1	l/hr	**Hole :**	BH2	**Flow :**	<0.1	l/hr
MP State :	OK	**R of C :**			**MP State :**	Poor	**R of C :**	Slow	
SWL :	3.51	**MP Depth :**	4.5	m	**SWL :**	2.01	**MP Depth :**	4.07	m
Sample :	No	**BG O_2 :**	20.4	% v/v	**Sample :**	No	**BG O_2 :**	20.5	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	20.3	30	<0.1	<0.1	<0.1	20.3
60	<0.1	<0.1	<0.1	20.2	60	<0.1	<0.1	0.1	19.6
90	<0.1	<0.1	0.1	19.9	90	<0.1	<0.1	0.4	19.5

Hole :	BH3	**Flow :**	0.3	l/hr	**Hole :**	BH4	**Flow :**	-0.3	l/hr
MP State :	OK	**R of C :**	Steady		**MP State :**	OK	**R of C :**	Steady	
SWL :	2.37	**MP Depth :**	5.8	m	**SWL :**	1.61	**MP Depth :**		m
Sample :	No	**BG O_2 :**	20.4	% v/v	**Sample :**	No	**BG O_2 :**	20.4	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	20.1	30	<0.1	<0.1	<0.1	20.4
60	<0.1	<0.1	<0.1	20.1	60	<0.1	<0.1	<0.1	20.2
90	<0.1	<0.1	<0.1	20	90	<0.1	<0.1	<0.1	20

Hole :	BH5	**Flow :**	0.2	l/hr	**Hole :**	BH6	**Flow :**	-0.5	l/hr
MP State :	OK	**R of C :**	Steady		**MP State :**	OK	**R of C :**	Steady	
SWL :	Dry	**MP Depth :**	2.07	m	**SWL :**	1.32	**MP Depth :**	5.3	m
Sample :	No	**BG O_2 :**	20.4	% v/v	**Sample :**	No	**BG O_2 :**	20.5	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	20.2	30	<0.1	<0.1	<0.1	20.4
60	<0.1	<0.1	<0.1	19.6	60	<0.1	<0.1	<0.1	20.3
90	<0.1	<0.1	<0.1	19.5	90	<0.1	<0.1	<0.1	20.2

NOTES :

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Operator : _____

GAS MONITORING RECORD SHEET

WSP ENVIRONMENTAL

Site :	MOD Hayes	**Ground Conditions :**	Damp
Job No :	12170437	**Weather :**	Sunny
Date :	14.10.03	**Pressure :**	High
Instrumentation :			
GA 94 Infra Red Gas Analyser		**Start :**	1018 **mb at**
Flow Pod and Electric Contact Dip Meter		**Finish :**	1021 **mb at**

Hole :	BH7	**Flow :**	1.3	l/hr	**Hole :**	BH8	**Flow :**	<0.1	l/hr
MP State :	OK	**R of C :**	Steady		**MP State :**	OK	**R of C :**		
SWL :	2.11	**MP Depth :**	4	m	**SWL :**	1.86	**MP Depth :**	7.13	m
Sample :	Yes	**BG O_2 :**	20.5	% v/v	**Sample :**	Yes	**BG O_2 :**	20.5	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	20.2	**30**	<0.1	<0.1	<0.1	20.3
60	<0.1	<0.1	<0.1	19.7	**60**	<0.1	<0.1	<0.1	20.3
90	<0.1	<0.1	<0.1	18.4	**90**	<0.1	<0.1	<0.1	20.3

Hole :	BH9	**Flow :**	0.1	l/hr	**Hole :**	BH10	**Flow :**	0.3	l/hr
MP State :	OK	**R of C :**	Slow		**MP State :**	OK	**R of C :**	Steady	
SWL :	1.62	**MP Depth :**	2.5	m	**SWL :**	2.55	**MP Depth :**	3.55	m
Sample :	Yes	**BG O_2 :**	20.5	% v/v	**Sample :**	Yes	**BG O_2 :**	20.7	% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	20.3	**30**	<0.1	<0.1	<0.1	20.6
60	<0.1	<0.1	<0.1	20.5	**60**	<0.1	<0.1	<0.1	20.6
90	<0.1	<0.1	<0.1	20.4	**90**	<0.1	<0.1	<0.1	20.6

Hole :	BH15	**Flow :**	0.8	l/hr	**Hole :**		**Flow :**		l/hr
MP State :	OK	**R of C :**			**MP State :**		**R of C :**		
SWL :	2.35	**MP Depth :**	5.37	m	**SWL :**		**MP Depth :**		m
Sample :	No	**BG O_2 :**	20.5	% v/v	**Sample :**		**BG O_2 :**		% v/v

Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Time (secs)	LEL (%)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
30	<0.1	<0.1	<0.1	20.2	**30**				
60	<0.1	<0.1	<0.1	20.2	**60**				
90	<0.1	<0.1	<0.1	20.2	**90**				

NOTES :

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3
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Operator : _____

MOD Hayes

.12170437.

BOREHOLE SUMMARY

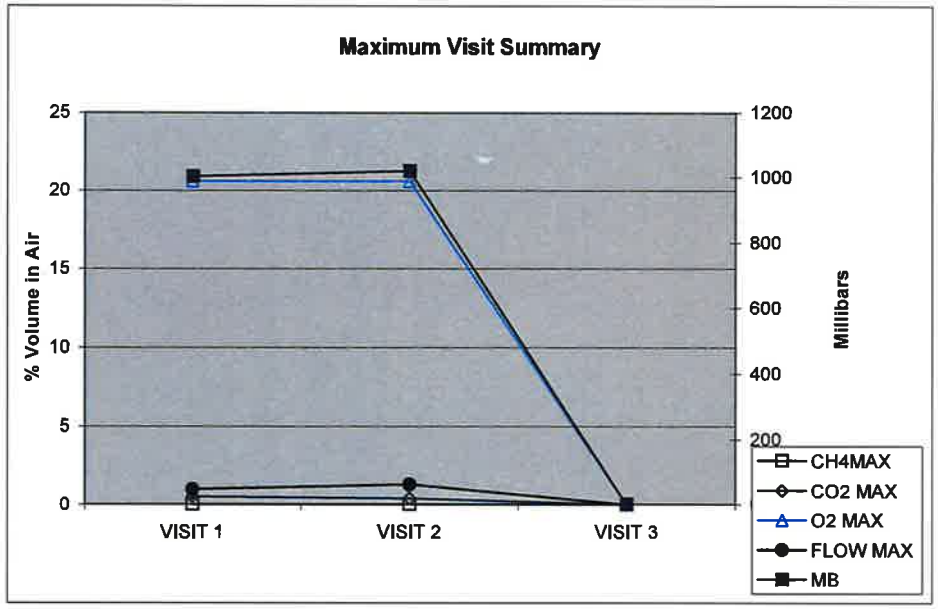
BH NO.	LEL (%) MIN	LEL (%) MAX	CH4 (% v/v) MIN	CH4 (% v/v) MAX	CO2 (% v/v) MIN	CO2 (% v/v) MAX	O2 (% v/v) MIN	O2 (% v/v) MAX	FLOW (l/hr) MIN	FLOW (l/hr) MAX	SWL (m bgl) MIN	SWL (m bgl) MAX
BH1	0	0	0	0	0.1	0.4	19.7	20.3	0.4	0.4	2.14	3.51
BH2	0	0	0	0	0.1	0.4	19.5	20.3	0	0	2	2.01
BH3	0	0	0	0	0	0	20	20.3	0	0.3	2.34	2.37
BH4	0	0	0	0	0	0	20	20.4	-0.3	-0.3	1.56	1.61
BH5	0	0	0	0	0	0	19.5	20.2	0.2	1	1.96	1.96
BH6	0	0	0	0	0	0	20.2	20.4	-0.5	-0.5	1.32	2.31
BH7	0	0	0	0	0.1	0.5	17	20.2	1.3	1.3	1.51	2.11
BH8	0.4	0.4	0	0	0	0	20	20.3	0	0	1.64	1.86
BH9	0	1.53	0	0	0	0	19.4	20.6	0	0.1	1.53	1.62
BH10	0	0	0	0	0	0	20.6	20.6	0	0.3	2.39	2.55
BH15	1.53	1.62	0	0	0	0.2	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

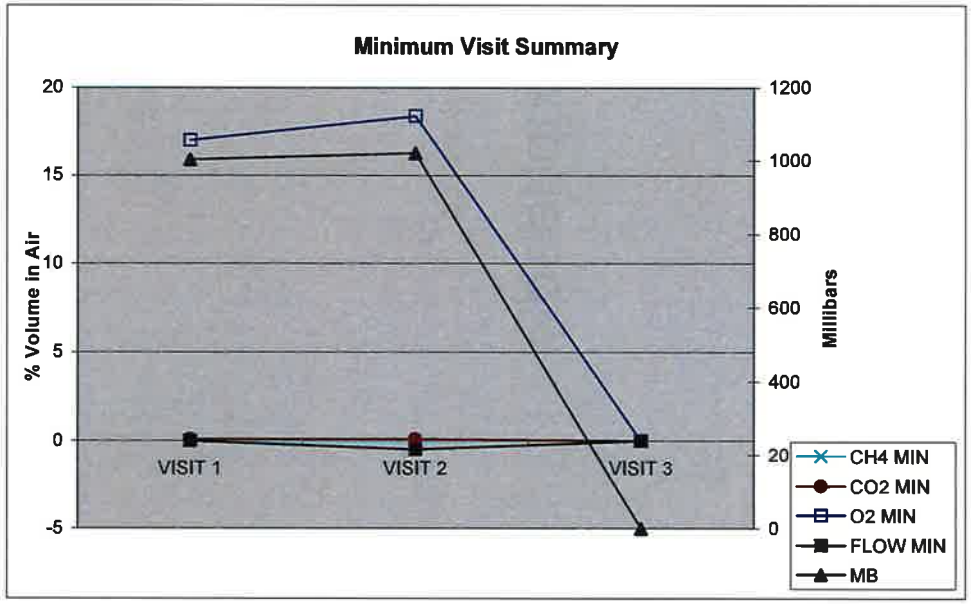
BH NO.	CH4 MAX CIRIA 149	CO2 MAX CIRIA 149	CH4 MAX PITR
BH1	1	1	A
BH2	1	1	A
BH3	1	1	A
BH4	1	1	A
BH5	1	1	A
BH6	1	1	A
BH7	1	1	A
BH8	1	1	A
BH9	1	1	A
BH10	1	1	A
BH15	1	1	A
0	1	1	A

CH4 (% v/v)	CO2 (% v/v)	Emmission Rate (BH) (l/hr)	Emmission Rate (BH) (m/s)	CIRIA 149 Gas Regime
<0.1	<1.5	not detected	not detected	1
>0.1-1	>1.5-5	not detected	not detected	2
>1-5	<5	not detected	not detected	3
>5-20	<20	<70.7	<0.01	4
>20	>20	<353.5	>0.01-0.05	5
>20	>20	>353.5	>0.05	6

CH4 (% v/v)	Emmission Rate (BH) (m/s)	Emmission Rate ($m^3/m^2/s$)	PITR Gas Regime	Equivalent CIRIA 149 Regime
1	0.005	0.98×10^{-6}	A	2
5	0.005	0.98×10^{-6}	B	3
5	0.01	1.96×10^{-6}	C	4
20	0.005	0.98×10^{-6}	D	4
20	0.01	1.98×10^{-6}	E	4
20	0.05	9.8×10^{-6}	F	5

	VISIT 1	VISIT 2	VISIT 3
MB	1004	1021	0
LEL MIN	0.4	0	0
LEL MAX	0.4	0	0
CH4 MIN	0	0	0
CH4MAX	0	0	0
CO2 MIN	0.1	0.1	0
CO2 MAX	0.5	0.4	0
O2 MIN	17	18.4	0
O2 MAX	20.6	20.6	0
FLOW MIN	0	-0.5	0
FLOW MAX	1	1.3	0
SWL MIN	1.51	1.32	0
SWL MAX	2.39	3.51	0


Maximum Visit Summary
% Volume in Air
Millibars
25
20
15
10
5
0
1200
1000
800
600
400
200
VISIT 1
VISIT 2
VISIT 3
CH4MAX
CO2 MAX
O2 MAX
FLOW MAX
MB


Minimum Visit Summary
% Volume in Air
Millibars
20
15
10
5
0
-5
1200
1000
800
600
400
20
0
VISIT 1
VISIT 2
VISIT 3
CH4 MIN
CO2 MIN
O2 MIN
FLOW MIN
MB

Appendix E

Chemical Data

MOD Records Office, Hayes

Phase II Geo-Environmental Assessment

CLEA Statistical Analysis of Chemical Data for Soils

WSP Environmental Limited
54 Hagley Road
Edgbaston
Birmingham
B16 8PE
Tel: +44(0) 121 456 1177
Fax: +44(0) 121 456 4737
http://www.wspgroup.com

CLEA STATISTICAL ANALYSIS OF CHEMICAL DATA FOR SOILS

Soil Guideline Values and Tier 1 Trigger Values Used in the Analysis

CLEA Residential Without Plant Uptake	
Arsenic	20
Lead	450
Nickel	75
Selenium	260
Mercury	15
Chromium	200
Cadmium	30

CLEA Residential With Plant Uptake	
Arsenic	20
Lead	450
Nickel	50
Selenium	35
Mercury	8
Chromium	130
Cadmium	1 @ pH 6
	2 @ pH 7
	8 @ pH 8

CLEA Allotments	
Arsenic	20
Lead	450
Nickel	50
Selenium	35
Mercury	8
Chromium	130
Cadmium	1 @ pH 6
	2 @ pH 7
	8 @ pH 8

CLEA Commercial and Industrial	
Arsenic	500
Lead	750
Nickel	5000
Selenium	8000
Mercury	480
Chromium	5000
Cadmium	1400

ICRCL Phytotoxic Metals	
Boron	3
Copper	130
Zinc	300

ICRCL Gardens, Allotments, Playing Fields	
PAH	50
Phenols	5
Free Cyanide	25
Complex Cyanide	250
Thiocyante	50
Sulphate	2000
Sulphide	250
Elemental Sulphur	5000
pH	<5 to >9

ICRCL Landscaped Areas, Buildings, Hard Cover	
PAH	1000
Phenols	5
Free Cyanide	100
Thiocyante	50
Sulphate	2000
Sulphide	250
Elemental Sulphur	5000
pH	<5 to >9

WSP TTV from EA Special Waste Classification	
TPH Screen	1000
TPH C6 - C10	1000
TPH C11 - C25	1000

Dutch Intervention Values / Dutch C (Former)			
PCB's by GCMS	1	Fluoranthene	100
TPH Mineral Oil (C26 - C40)	5000	benz(a)anthracene	50
Cresols	5	Chrysene	50
Total Phenols	40	benzo(k)fluoranthene	50
Vinyl Chloride	0.1	benzo(a)pyrene	10
Dichloromethane	20	Indeno(123-cd)pyrene	50
Chloroform	10	benzo(ghi)perylene	100
1,2-Dichloroethane	4	Total PAH GCMS(sum of 10)	40
Benzene	1	2-chlorophenol	5
Carbon tetrachloride	1	2,4-dichlorophenol	5
Trichloroethene (TCE)	50	2,6-dichlorophenol	5
Toluene	130	4-chloro-3-methyl phenol	5
Tetrachloroethene (PCE)	4	2,4,6-trichlorophenol	5
Chlorobenzene	10	2,4,5-trichlorophenol	5
Ethyl benzene	50	2,3,4,6-tetrachlorophenol	5
m,p-Xylenes	25	Pentachlorophenol	5
o-Xylene	25	Total Phthalates	60
1,3 Dichlorobenzene	10	1,3-dichlorobenzene	10
1,4 Dichlorobenzene	10	1,2-dichlorobenzene	10
1,2 Dichlorobenzene	10	1,4-dichlorobenzene	10
Naphthalene	50	1,2,4-trichlorobenzene	10
Phenanthrene	100	Hexachlorobenzene	10
Anthracene	100	Pentachlorobenzene	10

CLEA STATISTICAL ANALYSIS OF CHEMICAL DATA FOR SOILS

CLEA Statistics Tests - Reference Tables

Mean Value Test

T Values	
N	T Value
2	6.314
3	2.920
4	2.353
5	2.132
6	2.015
7	1.943
8	1.895
9	1.860
10	1.833
11	1.812
12	1.796
13	1.782
14	1.771
15	1.761
16	1.753
17	1.746
18	1.740
19	1.734
20	1.729
21	1.725
22	1.721
23	1.717
24	1.714
25	1.711
26	1.708
27	1.706
28	1.703
29	1.701
30	1.699

Maxium Value Test

Outlier Critical Values		
N	5.00%	10.00%
4	1.46	1.42
5	1.67	1.60
6	1.82	1.73
7	1.94	1.83
8	2.03	1.91
9	2.11	1.98
10	2.18	2.04
11	2.24	2.09
12	2.29	2.13
13	2.33	2.17
14	2.37	2.21
15	2.41	2.25
16	2.44	2.28
17	2.47	2.31
18	2.50	2.33
19	2.53	2.35
20	2.56	2.38

CLEA STATISTICAL ANALYSIS OF CHEMICAL DATA FOR SOILS

MOD Records Office, Hayes, Averaging Area 1: Proposed Residential Area

	Sample Number	Sample ID	Sample Depth	Arsenic	Cadmium	Chromium	Lead	Mercury	Copper	Nickel	Zinc	Selenium	TPH Screen	Phenol	Cyanide (Total)	pH	Sulphate
Samples	1	BH02	0.5	8.19	0.5	24.05	45.29	0.2	43.99	17.78	55.04	1	14	2.5	2	5.8	0.05
	2	BH04	0.55	15.88	0.5	26.02	235.9	0.83	75.01	53.72	132.3	1		2.5	2	7.7	0.05
	3	BH05	0.5	9.142	0.5	24.14	61.89	0.2	43.51	27.85	125.1	1	57	2.5	2	11.9	0.07
	4	BH05	1										28				
	5	TP09	0.5										7				
	6	TP12	0.5	13.59	0.8649	169.5	13650	0.2	203.6	566.1	1225	1	3455	2.5	2	11.4	0.19
	7	TP13	0.5	8.477	0.5	19.28	61.36	0.2	37.76	14.56	37.31	1	7	2.5	2	8.2	0.05
	8	WS04	0.5 - 0.7	7.563	0.5	13.78	24.49	0.2	35.34	15.87	38.92	1	98	2.5	2	8.9	0.06
	9	WS05	0.2 - 0.5	10.68	0.5	28.95	38.69	0.2	60.8	29.04	385	1	28	2.5	2	8.3	0.05
	10	WS07	0.1 - 0.4	11.7	0.5	63.46	27.41	0.2	93.06	58.1	86.4	1	7	2.5	2	8.2	0.11
	11																
	12																
	13																
	14																
	15																
	16																
	17																
	18																
	19																
	20																
	21																
	22																
	23																
	24																
	25																
	26																
	27																
	28																
	29																
	30																
Stat.	Minimum			7.6	0.5	13.8	24.5	0.2	35.3	14.6	37.3	1.0	7.0	2.5	2.0	5.8	0.1
	Maximum			15.9	0.9	169.5	13650.0	0.8	203.6	566.1	1225.0	1.0	3455.0	2.5	2.0	11.9	0.2
	95th Percentile			15.1	0.7	132.4	8955.1	0.6	164.9	388.3	931.0	1.0	2112.2	2.5	2.0	11.7	0.2
	[illegible]			[illegible]													
	Standard Deviation			[illegible]													
Data Value Test	Number of samples (n)			8	8	8	8	8	8	8	8	8	9	8	8	8	8
	t Value			1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.860	1.895	1.895	1.895	1.895
	SGV / TTV			20.0	8.0	130.0	450.0	8.0	130.0	50.0	300.0	35.0	1000.0	5.0	250.0	9.0	1.2
	Upper Bound Value			[illegible]													
Maximum Value Test	Maximum Value			15.9	0.9	169.5	13650.0	0.8	203.6	566.1	1225.0	1.0	3455.0	2.5	2.0	11.9	0.2
	[illegible]			[illegible]													
	Standard Deviation			[illegible]													
	Critical Value			[illegible]													
	Outlier Critical Value			[illegible]								#DIV/0!		#VALUE!	#DIV/0!	[illegible]	

CLEA STATISTICAL ANALYSIS OF CHEMICAL DATA FOR SOILS

MOD Records Office, Hayes, Averaging Area 1: Proposed Residential Area - Results Corrected for Hot-Spot in TP12

	Sample Number	Sample ID	Sample Depth	Arsenic	Cadmium	Chromium	Lead	Mercury	Copper	Nickel	Zinc	Selenium	TPH Screen	Phenol	Cyanide (Total)	pH	Sulphate
Samples	1	BH02	0.5	8.19	0.5	24.05	45.29	0.2	43.99	17.78	55.04	1	14	2.5	2	5.8	0.05
	2	BH04	0.55	15.88	0.5	26.02	235.9	0.83	75.01	53.72	132.3	1		2.5	2	7.7	0.05
	3	BH05	0.5	9.142	0.5	24.14	61.89	0.2	43.51	27.85	125.1	1	57	2.5	2	11.9	0.07
	4	BH05	1										28				
	5	TP09	0.5										7				
	6	TP12	0.5	13.59	0.8649	169.5		0.2	203.6			1		2.5	2		0.19
	7	TP13	0.5	8.477	0.5	19.28	61.36	0.2	37.76	14.56	37.31	1	7	2.5	2	8.2	0.05
	8	WS04	0.5 - 0.7	7.563	0.5	13.78	24.49	0.2	35.34	15.87	38.92	1	98	2.5	2	8.9	0.06
	9	WS05	0.2 - 0.5	10.68	0.5	28.95	38.69	0.2	60.8	29.04	385	1	28	2.5	2	8.3	0.05
	10	WS07	0.1 - 0.4	11.7	0.5	63.46	27.41	0.2	93.06	58.1	86.4	1	7	2.5	2	8.2	0.11
	11																
	12																
	13																
	14																
	15																
	16																
	17																
	18																
	19																
	20																
	21																
	22																
	23																
	24																
	25																
	26																
	27																
	28																
	29																
	30																
Stat	Minimum			7.6	0.5	13.8	24.5	0.2	35.3	14.6	37.3	1.0	7.0	2.5	2.0	5.8	0.1
	Maximum			15.9	0.9	169.5	235.9	0.8	203.6	58.1	385.0	1.0	98.0	2.5	2.0	11.9	0.2
	95th Percentile			15.1	0.7	132.4	183.7	0.6	164.9	56.8	309.2	1.0	83.7	2.5	2.0	11.0	0.2
Student Value	[illegible]			[illegible]													
	Standard Deviation			[illegible]													
	Number of samples (n)			8	8	8	7	8	8	7	7	8	8	8	8	7	8
	t Value			1.895	1.895	1.895	1.943	1.895	1.895	1.943	1.943	1.895	1.895	1.895	1.895	1.943	1.895
	SGV / TTV			20.0	8.0	130.0	450.0	8.0	130.0	50.0	300.0	35.0	1000.0	5.0	250.0	9.0	1.2
	Upper Bound Value			[illegible]													
Assessment Value	Maximum Value			15.9	0.9	169.5	235.9	0.8	203.6	58.1	385.0	1.0	98.0	2.5	2.0	11.9	0.2
	[illegible]			[illegible]													
	Standard Deviation			[illegible]													
	t Critical Value			1.910	1.910	1.910	1.890	1.910	1.910	1.890	1.890	1.910	1.910	1.910	1.910	1.890	1.910
	Outlier Critical Value			[illegible]								#DIV/0!	[illegible]	#VALUE!	#DIV/0!	[illegible]	

CLEA STATISTICAL ANALYSIS OF CHEMICAL DATA FOR SOILS

MOD Records Office, Hayes: Averaging Area 2 - Proposed Commercial Area

	Sample Number	Sample ID	Sample Depth	Arsenic	Cadmium	Chromium	Lead	Mercury	Copper	Nickel	Zinc	Selenium	TPH Screen	Phenol	Cyanide (Total)	pH	Sulphate
Samples	1	BH01	0.5	15.73	0.5	46.82	30.64	0.2	73.22	47.45	68.63	1		2.5	2	6.6	0.05
	2	BH01	0.55										28				
	3	BH03	0.35	18.08	0.6913	40.18	193.7	0.2	204	109.8	195.1	1	712	2.5	2	6	0.05
	4	BH06	0.5	12.25	0.5	40.08	27.7	0.2	73.19	45.44	72.06	1	42	2.5	2	8.1	0.05
	5	BH09	1	10.41	0.5	40.45	21.64	0.2	60.47	27.14	50.8	1		2.5	2	7	0.05
	6	BH10	1	12.66	0.5	36.84	22.15	0.2	66.64	37.05	55	1		2.5	2	7.2	0.05
	7	TP01	0.4	13.02	1.675	46.23	120.8	0.45	84.66	57.63	143.3	1	28	2.5	2	7.2	0.05
	8	TP02	0.8	12.78	0.5	26.27	156.9	0.51	60.18	24.64	85.08	1	14	2.5	2	7.8	0.05
	9	TP03	0.6	10.39	0.5	32.75	24.58	0.2	58.43	29.96	56.44	1		2.5	2	7.6	0.05
	10	TP03	0.65										7				
	11	TP04	0.5	10.55	0.5	36.43	24.66	0.2	64.45	28.72	57.55	1		2.5	2	5.9	0.05
	12	TP05	0.8	8.695	0.5	28.15	29.56	0.2	50.51	21.92	65.07	1	14	2.5	2	6.7	0.12
	13	TP06	0.5	9.631	1.099	35.94	60.98	0.32	56.89	24.78	112.2	1	21	2.5	2	6.4	0.1
	14	TP07	0.5	11.3	0.5	27.4	61.06	0.26	54.13	23.12	65.52	1	55	2.5	2	7.7	0.05
	15	TP08	0.5	9.2	0.5	22.26	61.5	0.25	43.92	14.45	58	1	21	2.5	2	6	0.07
	16	TP10	0.5	9.326	0.5	29.6	21.62	0.2	54.63	20.86	53.4	1		2.5	2	6.1	0.05
	17	TP11	0.5	9.146	0.5	20.41	23.13	0.2	52.43	15.88	42.48	1		2.5	2	7.9	0.05
	18	TP14	0.5	10.89	0.5	25.46	25	0.2	48.83	24.18	44.13	1	7	2.5	2	8.5	0.05
	19	TP15	0.5	8.997	0.5	26.95	69.56	0.2	50.14	25.84	100.9	1	118	2.5	2	5.7	0.09
	20	WS01	0.4 - 0.6	11.03	0.5	29.77	21.34	0.2	57.17	20.39	44.26	1		2.5	2	7.9	0.05
	21	WS02	0.5 - 0.8	8.784	0.5	19.23	14.88	0.2	43.39	14.8	28.35	1		2.5	2	7.9	0.05
	22	WS08	0.1 - 0.5	20.91	0.6626	41.09	259	0.2	265	89.96	302.6	1	102	2.5	2	8.4	0.16
	23	WS09	0.1 - 0.25	5.78	0.5	17.77	24.12	0.2	37.61	19.85	69.31	1	732	2.5	2	11.1	0.22
	24	WS10	0.8 - 1.0	13.02	0.5	41.94	22.77	0.2	76.48	42.72	62.44	1	21	2.5	2	7.3	6.05
	25	WS12	0.8 - 1.0										14				
	26	WS13	0.2 - 0.5	9.117	0.5	20.83	12.56	0.2	14.61	25.42	37.03	1	7	2.5	2	10.5	0.24
	27																
	28																
	29																
	30																
Data	Minimum			5.8	0.5	17.8	12.6	0.2	14.6	14.5	28.4	1.0	7.0	2.5	2.0	5.7	0.1
	Maximum Value			20.9	1.7	46.8	259.0	0.5	265.0	109.8	302.6	1.0	732.0	2.5	2.0	11.1	6.1
	95th Percentile			17.8	1.1	45.8	190.0	0.4	192.1	86.7	189.9	1.0	716.0	2.5	2.0	10.3	0.2
Student's t-test	[illegible]			[illegible]													
	Standard Deviation			[illegible]													
	Number of samples (n)			23	23	23	23	23	23	23	23	23	17	23	23	23	23
	t Value			1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.746	1.717	1.717	1.717	1.717
	SGV / TTV			500.0	1400.0	5000.0	750.0	480.0	130.0	5000.0	300.0	8000.0	1000.0	5.0	250.0	9.0	1.2
	Upper Bound Value			[illegible]													
Maximum Value Test	Maximum Value			20.9	1.7	46.8	259.0	0.5	265.0	109.8	302.6	1.0	732.0	2.5	2.0	11.1	6.1
	[illegible]			[illegible]													
	Standard Deviation			[illegible]													
	t Critical Value			2.380	2.380	2.380	2.380	2.380	2.380	2.380	2.380	2.380	2.310	2.380	2.380	2.380	2.380
	Outlier Critical Value			[illegible]								#DIV/0!	[illegible]				

Certificate of Analysis

Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,
1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AVENUE, HAYES, MIDDLESEX

Date of sampling: 23/9-2/10/03
Date of receipt: 03/10/03

	Method Number		203	203	203	203	203	203	203	204	205	214	211	202	206	201	212	213
Sample. Ref.	Sample	Depth (m)	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Se	B*	TPH*	PhOH	PAH*	CN(T)	pH*	SO_4*
E8998	BH01	0.50	16	<0.5	47	73	47	31	69	<0.20	<1.00	-	-	<2.5	-	<2.0	6.6	<0.05
E8999	BH01	0.55	-	-	-	-	-	-	-	-	-	-	28	-	-	-	-	-
E9000	BH01	5.40	16	<0.5	58	92	50	23	82	<0.20	<1.00	-	14	<2.5	-	<2.0	6.7	<0.05
E9001	BH02	0.50	8	<0.5	24	44	18	45	55	<0.20	<1.00	-	14	<2.5	-	<2.0	5.8	<0.05
E9002	BH03	0.35	18	0.69	40	204	110	194	195	<0.20	<1.00	-	712	<2.5	-	<2.0	6.0	<0.05
E9003	BH03	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9004	BH04	0.55	16	<0.5	26	75	54	236	132	0.83	<1.00	-	-	<2.5	-	<2.0	7.7	<0.05
E9005	BH04	1.20	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-
E9006	BH04	3.70	14	<0.5	62	119	57	28	102	<0.20	<1.00	-	21	<2.5	-	<2.0	8.4	<0.05
E9007	BH05	0.50	9	<0.5	24	44	28	62	125	<0.20	<1.00	-	57	<2.5	-	<2.0	11.9	0.07
E9008	BH05	1.00	-	-	-	-	-	-	-	-	-	-	28	-	-	-	-	-
E9009	BH05	1.75	-	-	-	-	-	-	-	-	-	-	49	-	-	-	-	-
E9010	BH06	0.50	12	<0.5	40	73	45	28	72	<0.20	<1.00	-	42	<2.5	-	<2.0	8.1	<0.05
E9011	BH08	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9012	BH08	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9013	BH08	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9014	BH08	4.00	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
E9015	BH09	1.00	10	<0.5	40	60	27	22	51	<0.20	<1.00	-	-	<2.5	-	<2.0	7.0	<0.05
E9016	BH10	1.00	13	<0.5	37	67	37	22	55	<0.20	<1.00	-	-	<2.5	-	<2.0	7.2	<0.05
E9017	TP01	0.40	13	1.68	46	85	58	121	143	0.45	<1.00	-	28	<2.5	-	<2.0	7.2	<0.05

AUTHORISED BY: P. Gribble

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY: A P Byrom

Date of Issue: 24/10/03
Date of Analysis : 03-23/10/03

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Unaccredited tests are marked by an asterisk (*). Soils are sampled in accordance with BS5930:1999 unless otherwise stated. Chemical analysis of soil is in accordance with in house WSP Chemistry Procedures. Information supplied by E-mail may be subject to error during transfer. For the authoritative test results refer to hard copy of report. As = arsenic, Cd = cadmium, Cr = chromium, Pb = lead, Hg = mercury, Cu = copper, Ni = nickel, Zn = zinc, Se = selenium, B = boron, TPH = total petroleum hydrocarbons, PhOH = monohydric phenols, PAH = polyaromatic hydrocarbons, CN(T) = cyanide (total), SO_4 = sulphate, TEM = toluene extractable material, IS = insufficient sample, C = sample too cloudy to analyse, ND = not detected, - = not tested. IF = insufficient filtrate. + = >2mm fraction used in analysis. All units mg/kg except SO_4 (g/l).

Certificate of Analysis

Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,
1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AVENUE, HAYES, MIDDLESEX

Date of sampling: 23/9-2/10/03
Date of receipt: 03/10/03

	Method Number		203	203	203	203	203	203	203	204	205	214	211	202	206	201	212	213
Sample. Ref.	Sample	Depth (m)	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Se	B*	TPH*	PhOH	PAH*	CN(T)	pH*	SO_4*
E9018	TP02	0.8	13	<0.5	26	60	25	157	85	0.51	<1.00	-	14	<2.5	-	<2.0	7.8	<0.05
E9019	TP03	0.6	10	<0.5	33	58	30	25	56	<0.20	<1.00	-	-	<2.5	-	<2.0	7.6	<0.05
E9020	TP03	0.7	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
E9021	TP04	0.5	11	<0.5	36	64	29	25	58	<0.20	<1.00	-	-	<2.5	-	<2.0	5.9	<0.05
E9022	TP05	0.8	9	<0.5	28	51	22	30	65	<0.20	<1.00	-	14	<2.5	-	<2.0	6.7	0.12
E9023	TP06	0.5	10	1.10	36	57	25	61	112	0.32	<1.00	-	21	<2.5	-	<2.0	6.4	0.10
E9024	TP07	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9025	TP07	0.5	11	<0.5	27	54	23	61	66	0.26	<1.00	-	55	<2.5	-	<2.0	7.7	<0.05
E9026	TP08	0.5	9	<0.5	22	44	14	62	58	0.25	<1.00	-	21	<2.5	-	<2.0	6.0	0.07
E9027	TP09	0.5	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
E9028	TP10	0.5	9	<0.5	30	55	21	22	53	<0.20	<1.00	-	-	<2.5	-	<2.0	6.1	<0.05
E9029	TP11	0.5	9	<0.5	20	52	16	23	42	<0.20	<1.00	-	-	<2.5	-	<2.0	7.9	<0.05
E9030	TP11	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9031	TP12	0.5	14	0.86	170	204	566	13650	1225	<0.20	<1.00	-	3455	<2.5	-	<2.0	11.4	0.19
E9032	TP12	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9033	TP13	0.5	8	<0.5	19	38	15	61	37	<0.20	<1.00	-	7	<2.5	-	<2.0	8.2	<0.05
E9034	TP14	0.5	11	<0.5	25	49	24	25	44	<0.20	<1.00	-	7	<2.5	-	<2.0	8.5	<0.05
E9035	TP15	0.5	9	<0.5	27	50	26	70	101	<0.20	<1.00	-	118	<2.5	-	<2.0	5.7	0.09
E9036	WS01	0.4 - 0.6	11	<0.5	30	57	20	21	44	<0.20	<1.00	-	-	<2.5	-	<2.0	7.9	<0.05
E9037	WS02	0.5 - 0.8	9	<0.5	19	43	15	15	28	<0.20	<1.00	-	-	<2.5	-	<2.0	7.9	0.05

AUTHORISED BY: P. Gribble

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY: A P Byrom

Date of Issue: 24/10/03
Date of Analysis : 03-23/10/03

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Certificate of Analysis

Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,
1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AVENUE, HAYES, MIDDLESEX

Date of sampling: 23/9-2/10/03
Date of receipt: 03/10/03

	Method Number		203	203	203	203	203	203	203	204	205	214	211	202	206	201	212	213
Sample. Ref.	Sample	Depth (m)	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Se	B*	TPH*	PhOH	PAH*	CN(T)	pH*	SO_4*
E9038	WS03	0.75 - 0.9	-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-	-
E9039	WS03	1.5 - 1.8	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-
E9040	WS04	0.5 - 0.7	8	<0.5	14	35	16	24	39	<0.20	<1.00	-	98	<2.5	-	<2.0	8.9	0.06
E9041	WS04	1.8 - 2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9042	WS05	0.2 - 0.5	11	<0.5	29	61	29	39	385	<0.20	<1.00	-	28	<2.5	-	<2.0	8.3	<0.05
E9043	WS05	2.0 - 2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9044	WS05	3.8 - 4.0	-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-	-
E9045	WS07	0.1 - 0.4	12	<0.5	63	93	58	27	86	<0.20	<1.00	-	7	<2.5	-	<2.0	8.2	0.11
E9046	WS07	3.8 - 4.0	-	-	-	-	-	-	-	-	-	-	712	-	-	-	-	-
E9047	WS08	0.1 - 0.5	21	0.66	41	265	90	259	303	<0.20	<1.00	-	102	<2.5	-	<2.0	8.4	0.16
E9048	WS08	2.4 - 2.6	-	-	-	-	-	-	-	-	-	-	160	-	-	-	-	-
E9049	WS09	0.1 - 0.25	6	<0.5	18	38	20	24	69	<0.20	<1.00	-	732	<2.5	-	<2.0	11.1	0.22
E9050	WS10	0.8 - 1.0	13	<0.5	42	76	43	23	62	<0.20	<1.00	-	21	<2.5	-	<2.0	7.3	6.05
E9051	WS11	0.5 - 0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E9052	WS11	2.8 - 3.0	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
E9053	WS12	0.8 - 1.0	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-
E9054	WS13	0.2 - 0.5	9	<0.5	21	15	25	13	37	<0.20	<1.00	-	7	<2.5	-	<2.0	10.5	0.24
E9055	WS14	0.5 - 0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AUTHORISED BY: P. Gribble

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY: A F Rymon

Date of Issue: 24/10/03
Date of Analysis : 03-23/10/03

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Certificate of Analysis: Speciated PAHS

Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,

1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF

Date of sampling: 23/9-2/10/03

Date of receipt: 03/10/03

Site Address: MOD RECORDS OFFICE, BOURNE AVENUE, HAYES, MIDDLESEX

Sample. Ref.	Sample	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
E8998	BH01	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9000	BH01	5.4	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9001	BH02	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9002	BH03	0.35	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9006	BH04	3.7	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9007	BH05	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9010	BH06	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9015	BH09	1	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9016	BH10	1	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9017	TP01	0.4	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9018	TP02	0.8	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9020	TP03	0.65	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9021	TP04	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9022	TP05	0.8	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9023	TP06	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9025	TP07	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9026	TP08	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9028	TP10	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9029	TP11	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9031	TP12	0.5	<0.3	<0.4	<0.1	<0.3	5.2	<0.3	6.6	5.3	2.4	2.9	1.6	2.2	2.2	1.4	<0.3	1.2

AUTHORISED BY: P. Gribble

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY: A P Byrom

Date of Issue: 24/10/03

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UKAS TESTING 0206

Certificate of Analysis: Speciated PAHS

Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,

1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF

Date of sampling: 23/9-2/10/03

Date of receipt: 03/10/03

Site Address: MOD RECORDS OFFICE, BOURNE AVENUE, HAYES, MIDDLESEX

Sample. Ref.	Sample	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
E9033	TP13	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9034	TP14	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9035	TP15	0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9036	WS01	0.4 - 0.6	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9037	WS02	0.5 - 0.8	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9040	WS04	0.5 - 0.7	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9042	WS05	0.2 - 0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9045	WS07	0.1 - 0.4	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9047	WS08	0.1 - 0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9049	WS09	0.1 - 0.25	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9050	WS10	0.8 - 1.0	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9051	WS11	0.5 - 0.6	<0.3	<0.4	<0.1	<0.3	1.6	<0.3	1.8	1.6	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
E9054	WS13	0.2 - 0.5	<0.3	<0.4	<0.1	<0.3	<0.3	<0.3	1.6	1.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3

AUTHORISED BY: P. Gribble

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY:

Date of Issue: 24/10/03

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Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,
1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AVENUE, HAYES, MIDDLESEX

Date of sampling: 23/9-2/10/03
Date of receipt: 03/10/03

Sample. Ref.	Sample	Depth (m)	PRO C6-C10*	DRO C10-C24	MINERAL OIL C24-C40*	MTBE*	BENZENE*	TOLUENE*	ETHYL BENZENE*	XYLENE*
			mg/Kg	mg/Kg	mg/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
E9008	BH05	1	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9013	BH08	2.0	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9030	TP11	1.7	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9032	TP12	1.6	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9038	WS03	0.75 - 0.9	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9041	WS04	1.8 - 2.0	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9043	WS05	2.0 - 2.5	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9048	WS08	2.4 - 2.6	2.5	222.0	58.0	<1.0	<0.3	0.8	1.2	7.9
E9051	WS11	0.5 - 0.6	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9054	WS13	0.2 - 0.5	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4
E9055	WS14	0.5 - 0.7	<0.2	<50	<50	<1.0	<0.3	<0.2	<0.3	<0.4

AUTHORISED BY: P. Gribble

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY: A T Bynon

Date of Issue: 24/10/03

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PRO = petrol range organics, DRO = diesel range organics, MTBE = methyl tertiary butyl ether, !S= insufficient sample, - = not tested.

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Certificate of Analysis : VOCS

Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,
1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E8999 Date of sampling:23/9-2/10/03
Sample : BH01 Date of receipt:03/10/03
Depth (m) : 0.55

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

AUTHORISED BY: P. Gribble Date of Issue: 23/10/03

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CHECKED BY:

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Lab. No.: 03/1003/C Project No.:12170423

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1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9003 Date of sampling:23/9-2/10/03
Sample : BH03 Date of receipt:03/10/03
Depth (m) : 0.5

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

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CHECKED BY: A P Rayner

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Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9007 Date of sampling:23/9-2/10/03
Sample : BH05 Date of receipt:03/10/03
Depth (m) : 0.5

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

AUTHORISED BY: P. Gribble Date of Issue: 23/10/03

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CHECKED BY: A P Rymer

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Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,
1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9012 Date of sampling:23/9-2/10/03
Sample : BH08 Date of receipt:03/10/03
Depth (m) : 1.5

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

AUTHORISED BY: Date of Issue: 23/10/03

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY:

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Certificate of Analysis : VOCS

Lab. No.: 03/1003/C Project No.:12170423

Client: PROLOGIS DEVELOPMENTS LTD, PROLOGIS HOUSE,
1 MONKSPATH HALL RD, SOLIHULL, W. MIDLANDS B90 4VF
Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9017 Date of sampling:23/9-2/10/03
Sample : TP01 Date of receipt:03/10/03
Depth (m) : 0.4

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

AUTHORISED BY: P. Gribble Date of Issue: 23/10/03

Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY: A P Brymer

UKAS TESTING 0206

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Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9040 Date of sampling:23/9-2/10/03
Sample : WS04 Date of receipt:03/10/03
Depth (m) : 0.5 - 0.7

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

UKAS TESTING 0206

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Paul Gribble, Head of Inorganic Chemistry.

CHECKED BY: A P Byrne

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Sample reference : E9042 Date of sampling:23/9-2/10/03
Sample : WS05 Date of receipt:03/10/03
Depth (m) : 0.2 - 0.5

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

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Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9051 Date of sampling:23/9-2/10/03
Sample : WS11 Date of receipt:03/10/03
Depth (m) : 0.5 - 0.6

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

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Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9054 Date of sampling:23/9-2/10/03
Sample : WS13 Date of receipt:03/10/03
Depth (m) : 0.2 - 0.5

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	<0.3
Chloroethane	<1.0	m-Xylene	<0.2
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	<0.2
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	<0.8
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	<0.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	<0.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	<0.9
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	<1.0
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	<1.9
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	<0.2	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	<2.6
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

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Site Address: MOD RECORDS OFFICE, BOURNE AV., HAYES, MIDDLESEX

Sample reference : E9048 Date of sampling:23/9-2/10/03
Sample : WS08 Date of receipt:03/10/03
Depth (m) : 2.4 - 2.6

Compound	ug/kg	Compound	ug/kg
Chloromethane	<4.0	Tetrachloroethene	<0.8
Dichlorodifluoromethane	<1.0	Chlorobenzene	<0.2
Vinyl Chloride	<1.0	1,1,1,2-Tetrachloroethane	<0.6
Bromomethane	<3.0	Ethylbenzene	1.2
Chloroethane	<1.0	m-Xylene	1.3
Trichlorofluoromethane	<1.0	Styrene	<0.3
Methyl Tert-Butyl ether (MTBE)	<0.5	Bromoform	<2.2
1,1-Dichloroethene	<0.5	o/p-Xylene	6.6
Dichloromethane	-	1,1,2,2-Tetrachloroethane	<1.2
Trans-1,2-Dichloroethene	<0.4	1,2,3-Trichloropropane	<1.1
1,1-Dichloroethane	<0.5	Isopropylbenzene	47.5
Cis-1,2-Dichloroethene	<1.0	Bromobenzene	<0.5
2,2-Dichloropropane	<6.2	n-Propylbenzene	132.7
Chloroform	<1.4	2-Chlorotoluene	<0.4
Bromochloromethane	<1.2	4-Chlorotoluene	<0.4
1,1,1-Trichloroethane	<0.6	1,3,5-Trimethylbenzene	16.6
1,2-Dichloroethane	<0.5	Tert-butylbenzene	44.5
1,1-Dichloropropene	<0.4	1,2,4-Trimethylbenzene	<0.5
Benzene	<0.3	sec-Butylbenzene	328.2
Carbon Tetrachloride	<0.6	1,4-Dichlorobenzene	<0.4
Trichloroethene	<0.4	1,3-Dichlorobenzene	<0.2
1,2-Dichloropropane	<0.4	1,2-Dichlorobenzene	<0.4
Dibromomethane	<0.5	n-Butylbenzene	279.8
Bromodichloromethane	<1.1	1,2-Dibromo-3-chloropropane	<1.1
Toluene	0.8	1,2,4-Trichlorobenzene	<0.6
1,1,2-Trichloroethane	<0.3	Naphthalene	659.3
1,3-Dichloropropane	<0.4	Hexachlorobutadiene	<6.0
Dibromochloromethane	<1.9	1,2,3-Trichlorobenzene	<0.5
1,2-Dibromoethane	<0.5		

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Certificate of Leachate Analysis*

Lab.No.:03/1003/C Project No.:12170423

Client: ProLogis Developments Ltd, ProLogis House,
1 Monkspath Hall Rd, Solihull, W. Midlands, B90 4VF
Site Address: MOD Records Office, Bourne Ave. Hayes, Middlesex

Date Sampled: 23/9-2/10/03
Date Received: 3/10/03
Date Scheduled: 7/10/03
Date Issued: 23/10/03

SAMPLE REF.	Detection Limit	Method	E9010	E9021	E9025	E9028	E9029	E9036	E9040			
Location			BH6	TP04	TP07	TP10	TP11	WS01	WS04			
Depth			0.5	0.5	0.5	0.5	0.5	0.4 - 0.6	0.5 - 0.7			
%Sample Analysed			100	100	89.7	63.1	100	100	56			
%Inert material *not analysed*			0	0	10.3	36.9	0	0	44			
Arsenic	10	303	<10	<10	<10	<10	<10	<10	<10			
Cadmium	5	303	<5	<5	<5	<5	<5	<5	<5			
Chromium (total)	6	303	<6	<6	<6	<6	<6	<6	<6			
Copper	5	303	<5	5	6	5	5	7	<5			
Nickel	6	303	<5	<5	<5	<5	<5	<5	<5			
Lead	25	303	<25	<25	<25	<25	<25	<25	<25			
Zinc	7	303	<7	<7	<7	<7	11 #	<7	<7			
Mercury	0.20	304	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20			
Selenium	N/A	305	–	–	–	–	–	–	–			
Boron	200	314	–	–	–	–	–	–	–			
Cyanide (total)	40	301	<40	<40	<40	<40	<40	<40	<40			
Cyanide (free)	N/A	315	–	–	–	–	–	–	–			
pH	N/A	212	6.2	6.1	7.0	6.4	7.4	7.2	8.6			
Sulphate# (water soluble)	20	313	<20	<20	<20	<20	23	21	<20			
Phenol (monohydric)	200	302	–	–	–	–	–	–	–			
TPH screen	2000	311	–	–	–	–	–	–	–			

AUTHORISED BY: **CHECKED BY:**

Paul Gribble, Head of Inorganic Chemistry.

Unaccredited tests are marked by an asterisk (*). Soils are sampled in accordance with BS5930:1999 unless otherwise stated. Chemical analysis of soil is in accordance with Chemistry Procedures and BS1377 Pt. 3:1990. Information supplied by E-mail may be subject to error during transfer. For the authoritative test results refer to hard copy of report. As = arsenic, Cd = cadmium, Cr = chromium, Pb = lead, Hg = mercury, Cu = copper, Ni = nickel, Zn = zinc, Se = selenium, B = boron, TPH = total petroleum hydrocarbons, PhOH = monohydric phenols, CN(F) = cyanide (free), CN(T) = cyanide (total), Asb = asbestos, IS = insufficient sample, C = sample too cloudy to analyse, ND = not detected, - = not tested. IF = insufficient filtrate. I/A = Inappropriate matrix. All results expressed as µg/litre in the Leachate except pH(pH units) and # = mg/litre. Inert material >10mm is removed and *NOT* analysed. # = See appendix

UKAS TESTING 0206

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Appendices

Lab.No.:03/1003/C Project No.:12170423

Client:	ProLogis Developments Ltd, ProLogis House, 1 Monkspath Hall Rd, Solihull, W. Midlands, B90 4VF
Site Address:	MOD Records Office, Bourne Ave. Hayes, Middlesex

Appendix 1

The zinc result could potentially be lower. This minor uncertainty is due to a slight zinc contamination of the blank.

Appendix 2

Appendix 3

Appendix 4

AUTHORISED BY:

CHECKED BY:

UKAS TESTING 0206

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23rd October 2003

TEST REPORT

Our Report No: B03023274

Your Order No: 6014

23 no. soil samples submitted for analysis on 16.10.2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Results enclosed: Pages 2-6

WSP ENVIRONMENTAL LTD.
NOTTINGHAM OFFICE
23 OCT 2003
Action

Laboratory analysis started on 16.10.2003
All laboratory analysis completed by 23rd October 2003

Jodie Bettis
Senior Project Co-ordinator
ALCONTROL TECHNICHEM

Leigh Burton
Project Co-ordinator
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UKAS TESTING
1141

TEST REPORT

SOIL ANALYTICAL RESULTS - 039 POLYCHLORINATED BIPHENYLS

Our Report No: B03023274

Your Order No: 6014

CLIENT: WSP Environmental Limited

23 no. soil samples submitted for analysis on 16.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:	**S03025374**	**S03025376**
Sample Ref :	**TP11**	**TP12**
Depth(m)	**0.5**	**0.5**
039 Polychlorinated Biphenyls (PCB's)		
PCB Congener 28	<0.03	<0.03
PCB Congener 52	<0.02	<0.02
PCB Congener 101	<0.03	<0.03
PCB Congener 118	<0.035	<0.035
PCB Congener 138	<0.05	<0.05
PCB Congener 153	<0.035	<0.035
PCB Congener 180	<0.055	<0.055
Total PCBs	ND	ND

All results expressed in mg/kg dry weight basis

ND denotes Not Detected

Total PCB = Sum of 7 identified components

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TEST REPORT

*SOIL ANALYTICAL RESULTS - Bulk Identification - Method 001 based upon MDHS 77 (Asbestos Screening Method *001a)*

Our Report No: B03023274

Page 3 of 6 pages

Your Order No: 6014

CLIENT: WSP Environmental Limited

23 no. soil samples submitted for analysis on 16.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:	Sample Ref:	Depth (m)	Description	Result of Asbestos Type(s)
S03025366	BH01	0.5	No Asbestos Detected	
S03025367	BH01	0.55	No Asbestos Detected	
S03025368	BH01	5.4	No Asbestos Detected	
S03025369	BH05	0.5	Cement Product	Chrysotile - Significant
S03025370	BH05	1.0	No Asbestos Detected	
S03025371	BH05	1.75	No Asbestos Detected	
S03025372	TP04	0.5	No Asbestos Detected	
S03025373	TP07	0.5	No Asbestos Detected	
S03025374	TP11	0.5	No Asbestos Detected	
S03025375	TP11	1.7	No Asbestos Detected	
S03025376	TP12	0.5	No Asbestos Detected	
S03025377	TP12	1.6	No Asbestos Detected	

Notes:- Estimates of asbestos content are defined as Trace (<2%), Significant (2 - 50%), and Substantial (>50%)

Any estimate of asbestos content within bulk materials is outside the scope of accreditation

* denotes analysis outside the scope of our UKAS accreditation

ALcontrol Technichem

TEST REPORT

*SOIL ANALYTICAL RESULTS - Bulk Identification - Method 001 based upon MDHS 77 (Asbestos Screening Method *001a)*

Our Report No: B03023274

Your Order No: 6014

CLIENT: WSP Environmental Limited

23 no. soil samples submitted for analysis on 16.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:	Sample Ref:	Depth (m)	Description	Result of Asbestos Type(s)
S03025378	TP15	0.5	No Asbestos Detected	
S03025379	WS07	0.1-0.4	No Asbestos Detected	
S03025380	WS07	3.8-4.0	No Asbestos Detected	
S03025381	WS09	0.1-0.25	No Asbestos Detected	

Notes:- Estimates of asbestos content are defined as Trace (<2%), Significant (2 - 50%), and Substantial (>50%)
Any estimate of asbestos content within bulk materials is outside the scope of accreditation
* denotes analysis outside the scope of our UKAS accreditation

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TEST REPORT

LEACHATE ANALYTICAL RESULTS

Our Report No: B03023274

Your Order No: 6014

CLIENT: WSP Environmental Limited

23 no. soil samples submitted for analysis on 16.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:	S03025359	S03025360	S03025361	S03025362	S03025363	S03025364	S03025365			
Sample Ref :	**BH06**	**TP04**	**TP07**	**TP10**	**TP11**	**WS01**	**WS04**			
Depth(m)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4-0.6**	**0.5-0.7**			
014 Monohydric Phenol	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
030 Hydrocarbon Oil by IR	<0.1	0.1	0.1	0.2	0.1	<0.1	<0.1			
016 Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			

All results expressed in mg/l

Method 004: NRA Leaching Test, Single Cycle, 24 hours; 10 parts water to one part soil

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TEST REPORT

LEACHATE ANALYTICAL RESULTS - 022 PAH SPECIATED

Our Report No: B03023274

Your Order No: 6014

CLIENT: WSP Environmental Limited

23 no. soil samples submitted for analysis on 16.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:	S03025359	S03025360	S03025361	S03025362	S03025363	S03025364	S03025365			
Sample Ref :	**BH06**	**TP04**	**TP07**	**TP10**	**TP11**	**WS01**	**WS04**			
Depth(m)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4-0.6**	**0.5-0.7**			
Naphthalene	0.0001	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002			
Acenaphthylene	<0.0001	<0.0001	0.0001	0.0002	<0.0001	<0.0001	<0.0001			
Acenaphthene	<0.0001	<0.0001	0.0001	0.0002	0.0001	0.0002	<0.0001			
Fluorene	0.0001	<0.0001	0.0002	0.0002	0.0001	0.0002	0.0002			
Phenanthrene	0.0005	0.0003	0.0002	0.0008	0.0004	0.0007	0.0010			
Anthracene	0.0004	0.0002	0.0002	0.0002	0.0001	0.0002	0.0003			
Fluoranthene	0.0003	0.0002	0.0002	0.0003	0.0002	0.0003	0.0005			
Pyrene	0.0003	0.0002	0.0002	0.0003	0.0002	0.0002	0.0004			
Benzo (a) anthracene	0.0002	0.0002	0.0003	0.0002	0.0002	0.0004	0.0002			
Chrysene	0.0003	0.0002	0.0003	0.0001	0.0001	0.0004	0.0001			
Benzo (b) fluoranthene	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Benzo (k) fluoranthene	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Benzo (a) pyrene	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Indeno (1,2,3-cd) pyrene	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Dibenzo (a,h) anthracene	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Benzo (g,h,i) perylene	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Total PAH	0.0022	0.0015	0.002	0.0028	0.0016	0.0028	0.0029			

All results expressed in mg/l

Total PAH = Sum of 16 identified components

ND denotes Not Detected

Method 004: NRA Leaching Test, Single Cycle, 24 hours; 10 parts water to one part soil

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23rd October 2003

TEST REPORT

Our Report No: B03023142

Your Order No: 5999

6 no. water samples submitted for analysis on 09.10.2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC826)

Results enclosed: Pages 2-7

Laboratory analysis started on 09.10.2003
All laboratory analysis completed by 23rd October 2003

Jodie Bettis
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TEST REPORT

WATER ANALYTICAL RESULTS

Our Report No: B03023142

Your Order No: 5999

CLIENT: WSP Environmental Limited

6 no. water samples submitted for analysis on 09.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC826)

Lab Ref No:	S03024442	S03024443	S03024444	S03024445	S03024446	S03024447				
Sample Ref :	**BH01**	**BH02**	**BH03**	**BH04**	**BH06**	**BH15**				
Depth(m)	-	-	-	-	-	-				
009 pH	6.8	6.8	6.9	7.4	6.7	6.5				
033 Electrical Conductivity (µS/cm)	1090	740	940	690	540	910				
016 Sulphate as SO_4	140	76	95	54	34	120				
061 Total Cyanide	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				
014 Monohydric Phenol	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				
054 COD	22	12	26	23	<10	<10				
057 Ammonia as N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
016 Arsenic	0.017	0.013	0.014	0.011	0.011	0.015				
016 Cadmium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
016 Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
016 Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
028 Mercury	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005				
016 Selenium	0.011	<0.01	<0.01	<0.01	<0.01	<0.01				
016 Copper	0.009	<0.005	0.012	0.008	0.006	0.008				
016 Nickel	0.010	0.006	0.008	<0.005	<0.005	<0.005				
016 Zinc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				

All results expressed in mg/l except for pH, unless stated

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TEST REPORT

WATER ANALYTICAL RESULTS - 040 VOC BY HEAD SPACE GC-MS Results in µg/l

Our Report No: B03023142

Your Order No: 5999

CLIENT: WSP Environmental Limited

6 no. water samples submitted for analysis on 09.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC826)

Lab Ref No:	S03024442	S03024443	S03024444	S03024445	S03024446	S03024447				
Sample Ref :	BH01	BH02	BH03	BH04	BH06	BH15				
Depth(m)	-	-	-	-	-	-				
Vinyl chloride	<10	<10	<10	<10	<10	<10				
Chloroethane	<1	<1	<1	<1	<1	<1				
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1				
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1				
1,1,2-trichloro-1,2,2-trifluoroethane	<25	<25	<25	<25	<25	<25				
Dichloromethane	<25	<25	<25	<25	<25	<25				
trans-1,2 Dichloroethene	<1	<1	<1	<1	<1	<1				
MTBE	<1	<1	<1	<1	<1	<1				
1,1 -Dichloroethane	<1	<1	<1	<1	<1	<1				
cis-1,2 dichloroethene	<1	<1	<1	<1	<1	<1				
Chloroform	<1	<1	<1	<1	<1	<1				
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1				
1,2-Dichloroethane	<1	<1	<1	<1	<1	<1				
Benzene	<1	<1	<1	<1	<1	<1				
Carbon tetrachloride	<1	<1	<1	<1	<1	<1				
Trichloroethene	<1	<1	<1	<1	<1	<1				
Bromodichloromethane	<1	<1	<1	<1	<1	<1				
cis-1,3 Dichloropropene	<1	<1	<1	<1	<1	<1				
Toluene	<1	<1	<1	<1	<1	<1				
trans-1,3 dichloropropene	<1	<1	<1	<1	<1	<1				
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1				
Dibromochloromethane	<1	<1	<1	<1	<1	<1				
Tetrachloroethene	<1	<1	<1	<1	<1	<1				
Chlorobenzene	<1	<1	<1	<1	<1	<1				
Ethyl benzene	<1	<1	<1	<1	<1	<1				
m,p-Xylenes	<1	<1	<1	<1	<1	<1				
Bromoform	<1	<1	<1	<1	<1	<1				
o-Xylene	<1	<1	<1	<1	<1	<1				
1,1,2,2 Tetrachloroethane	<1	<1	<1	<1	<1	<1				
1,3,5 Trimethylbenzene	<1	<1	<1	<1	<1	<1				
1,2,4 Trimethylbenzene	<1	<1	<1	<1	<1	<1				
1,3 Dichlorobenzene	<1	<1	<1	<1	<1	<1				
1,4 Dichlorobenzene	<1	<1	<1	<1	<1	<1				
1,2 Dichlorobenzene	<1	<1	<1	<1	<1	<1				

TEST REPORT

WATER ANALYTICAL RESULTS - 053 SVOC BY GC-MS Results in µg/l

Our Report No: B03023142 — Page 4 of 7 pages

Your Order No: 5999 — CLIENT: WSP Environmental Limited

6 no. water samples submitted for analysis on 09.10.2003 — DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue — Project Code: 12170423 (E17/DC826)

Lab Ref No:		S03024442	S03024443	S03024444	S03024445	S03024446
Sample Ref :		BH01	BH02	BH03	BH04	BH06
Depth(m)		-	-	-	-	-
PAH	naphthalene	<20	<20	<20	<20	<20
	2-chloronaphthalene	<20	<20	<20	<20	<20
	acenaphthylene	<30	<30	<30	<30	<30
	acenaphthene	<20	<20	<20	<20	<20
	fluorene	<30	<30	<30	<30	<30
	phenanthrene	<20	<20	<20	<20	<20
	anthracene	<20	<20	<20	<20	<20
	fluoranthene	<20	<20	<20	<20	<20
	pyrene	<20	<20	<20	<20	<20
	benz(a)anthracene	<20	<20	<20	<20	<20
	chrysene	<20	<20	<20	<20	<20
	benzo(b)fluoranthene	<25	<25	<25	<25	<25
	benzo(k)fluoranthene	<20	<20	<20	<20	<20
	benzo(a)pyrene	<25	<25	<25	<25	<25
	indeno(123-cd)pyrene	<40	<40	<40	<40	<40
	dibenzo(ah)anthracene	<40	<40	<40	<40	<40
	benzo(ghi)perylene	<40	<40	<40	<40	<40
PHENOLS	phenol	<20	<20	<20	<20	<20
	2-chlorophenol	<20	<20	<20	<20	<20
	2-methylphenol	<20	<20	<20	<20	<20
	4-methylphenol	<20	<20	<20	<20	<20
	2-nitrophenol	<20	<20	<20	<20	<20
	2,4-dimethylphenol	<20	<20	<20	<20	<20
	2,4-dichlorophenol	<20	<20	<20	<20	<20
	2,6-dichlorophenol	<20	<20	<20	<20	<20
	4-chloro-3-methyl phenol	<20	<20	<20	<20	<20
	2,4,6-trichlorophenol	<20	<20	<20	<20	<20
	2,4,5-trichlorophenol	<20	<20	<20	<20	<20
	4-nitrophenol	<50	<50	<50	<50	<50
	2,3,4,6-tetrachlorophenol	<30	<30	<30	<30	<30
	pentachlorophenol	<60	<60	<60	<60	<60
PHTHALATES	dimethylphthalate	<20	<20	<20	<20	<20
	diethyl phthalate	<20	<20	<20	<20	<20
	di-n-butyl phthalate	<30	<30	<30	<30	<30
	butyl benzyl phthalate	<60	<60	<60	<60	<60
ETHERS	bis(2-chloroethyl)ether	<15	<15	<15	<15	<15
	bis(2-chloroisopropyl)ether	<10	<10	<10	<10	<10
	4-chlorophenyl phenyl ether	<15	<15	<15	<15	<15
	bromo phenyl phenyl ether	<30	<30	<30	<30	<30
BENZENES	1,3-dichlorobenzene	<15	<15	<15	<15	<15
	1,2-dichlorobenzene	<10	<10	<10	<10	<10
	1,4-dichlorobenzene	<10	<10	<10	<10	<10
	nitrobenzene	<20	<20	<20	<20	<20
	1,2,4-trichlorobenzene	<10	<10	<10	<10	<10
	2,6-dinitrotoluene	<20	<20	<20	<20	<20
	2,4-dinitrotoluene	<20	<20	<20	<20	<20
	azobenzene	<30	<30	<30	<30	<30
	hexachlorobenzene	<20	<20	<20	<20	<20
OTHERS	hexachloroethane	<15	<15	<15	<15	<15
	n-nitroso-di-n-propyl-1-propanamine	<40	<40	<40	<40	<40
	isophorone	<20	<20	<20	<20	<20
	bis(2-chloroethoxy)methane	<15	<15	<15	<15	<15
	hexachlorobutadiene	<10	<10	<10	<10	<10
	anthraquinone	<30	<30	<30	<30	<30
	aniline	<40	<40	<40	<40	<40

TEST REPORT

WATER ANALYTICAL RESULTS - 053 SVOC BY GC-MS Results in µg/l

Our Report No: B03023142

Page 5 of 7 pages

Our Order No: 5999

CLIENT: WSP Environmental Limited

6 no. water samples submitted for analysis on 09.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC826)

Lab Ref No:		**S03024447**				
Sample Ref :		**BH15**				
Depth(m)		**-**				
PAH	naphthalene	<20				
	2-chloronaphthalene	<20				
	acenaphthylene	<30				
	acenaphthene	<20				
	fluorene	<30				
	phenanthrene	<20				
	anthracene	<20				
	fluoranthene	<20				
	pyrene	<20				
	benz(a)anthracene	<20				
	chrysene	<20				
	benzo(b)fluoranthene	<25				
	benzo(k)fluoranthene	<20				
	benzo(a)pyrene	<25				
	indeno(123-cd)pyrene	<40				
	dibenzo(ah)anthracene	<40				
	benzo(ghi)perylene	<40				
PHENOLS	phenol	<20				
	2-chlorophenol	<20				
	2-methylphenol	<20				
	4-methylphenol	<20				
	2-nitrophenol	<20				
	2,4-dimethylphenol	<20				
	2,4-dichlorophenol	<20				
	2,6-dichlorophenol	<20				
	4-chloro-3-methyl phenol	<20				
	2,4,6-trichlorophenol	<20				
	2,4,5-trichlorophenol	<20				
	4-nitrophenol	<50				
	2,3,4,6-tetrachlorophenol	<30				
	pentachlorophenol	<60				
PHTHALATES	dimethylphthalate	<20				
	diethyl phthalate	<20				
	di-n-butyl phthalate	<30				
	butyl benzyl phthalate	<60				
ETHERS	bis(2-chloroethyl)ether	<15				
	bis(2-chloroisopropyl)ether	<10				
	4-chlorophenyl phenyl ether	<15				
	bromo phenyl phenyl ether	<30				
BENZENES	1,3-dichlorobenzene	<15				
	1,2-dichlorobenzene	<10				
	1,4-dichlorobenzene	<10				
	nitrobenzene	<20				
	1,2,4-trichlorobenzene	<10				
	2,6-dinitrotoluene	<20				
	2,4-dinitrotoluene	<20				
	azobenzene	<30				
	hexachlorobenzene	<20				
OTHERS	hexachloroethane	<15				
	n-nitroso-di-n-propyl-1-propanamine	<40				
	isophorone	<20				
	bis(2-chloroethoxy)methane	<15				
	hexachlorobutadiene	<10				
	anthraquinone	<30				
	aniline	<40				

TEST REPORT

Our Report No: B03023142

Your Order No: 5999

CLIENT: WSP Environmental Limited

6 no. water samples submitted for analysis on 09.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC826)

WATER - RESULTS

Lab Ref No:	Sample Ref:	Depth(m)	*PRO by GC-MS (C_6-C_{10})	†*Hydrocarbon Broadscan DRO (C_{10}-C_{24})	Mineral Oils (C_{24}-C_{40})	Description
S03024442	BH01	-	<1	<0.1	<0.1	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
S03024443	BH02	-	<1	‡	‡	‡
S03024444	BH03	-	<1	<0.1	<0.1	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
S03024445	BH04	-	<1	<0.1	<0.1	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.

NOTE:

(i) †This method provides information only on Gas Chromatograph (GC) amenable material with elutions ranging between 40°C and 325°C.

(ii) The results are expressed as mg/l.

‡denotes insufficient sample available for analysis.

*Denotes analysis outside the scope of our UKAS accreditation.

TEST REPORT

Our Report No: B03023142

Your Order No: 5999

CLIENT: WSP Environmental Limited

6 no. water samples submitted for analysis on 09.10.2003

DATE OF ISSUE: 23rd October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC826)

WATER - RESULTS

Lab Ref No:	Sample Ref:	Depth(m)	*PRO by GC-MS (C_6-C_{10})	†*Hydrocarbon Broadscan DRO (C_{10}-C_{24})	Mineral Oils (C_{24}-C_{40})	Description
S03024446	BH06	-	<1	<0.1	<0.1	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
S03024447	BH15	-	<1	<0.1	<0.1	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.

NOTE:

(i) †This method provides information only on Gas Chromatograph (GC) amenable material with elutions ranging between 40°C and 325°C.

(ii) The results are expressed as mg/l.

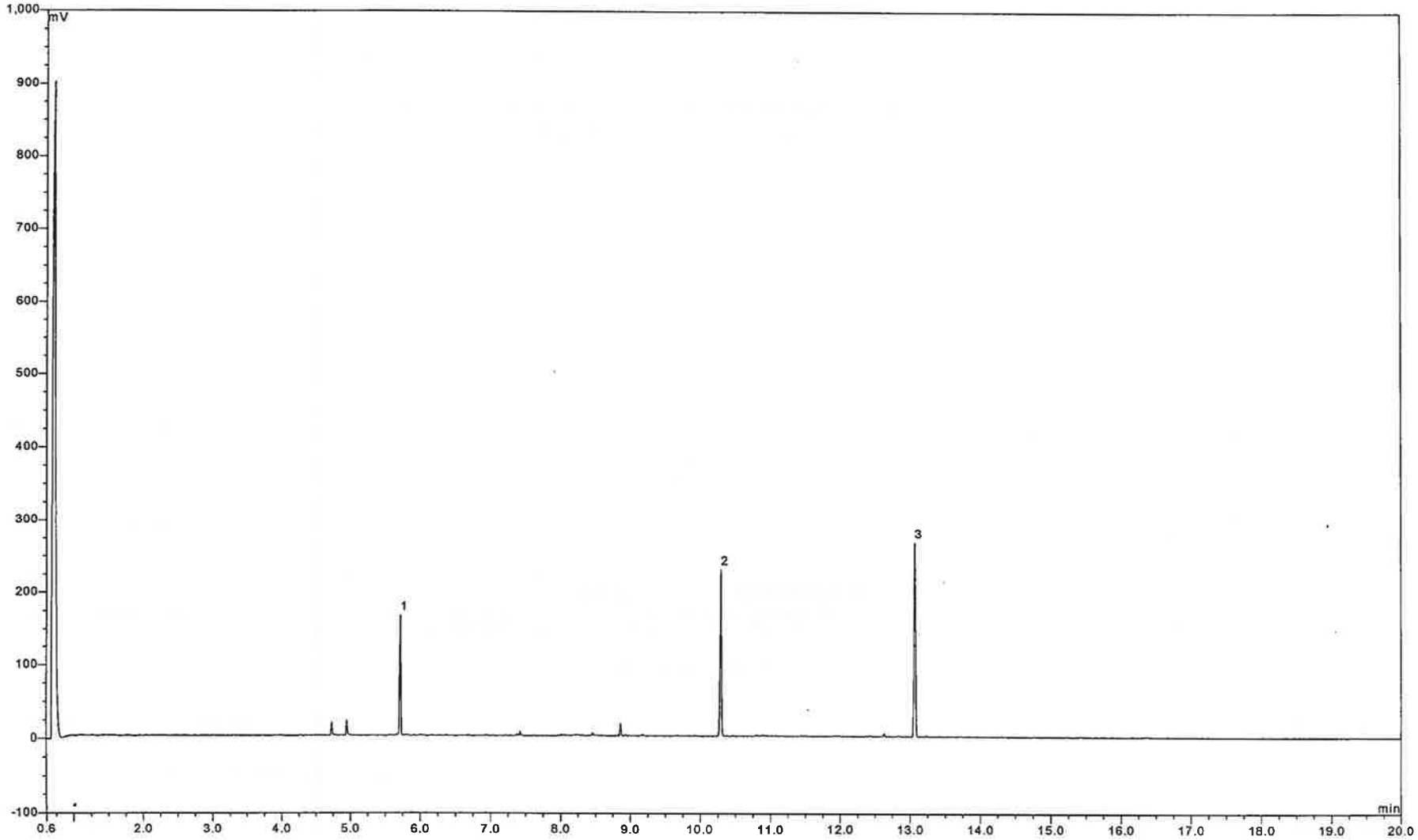
‡denotes insufficient sample available for analysis.

*Denotes analysis outside the scope of our UKAS accreditation.

Lab Ref No: - S03024442
Sample Ref: - BH01
Depth(m) - -
-

Internal Standards:

1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane



Lab Ref No: - S03024443
Sample Ref: - BH02
Depth(m) - -
-

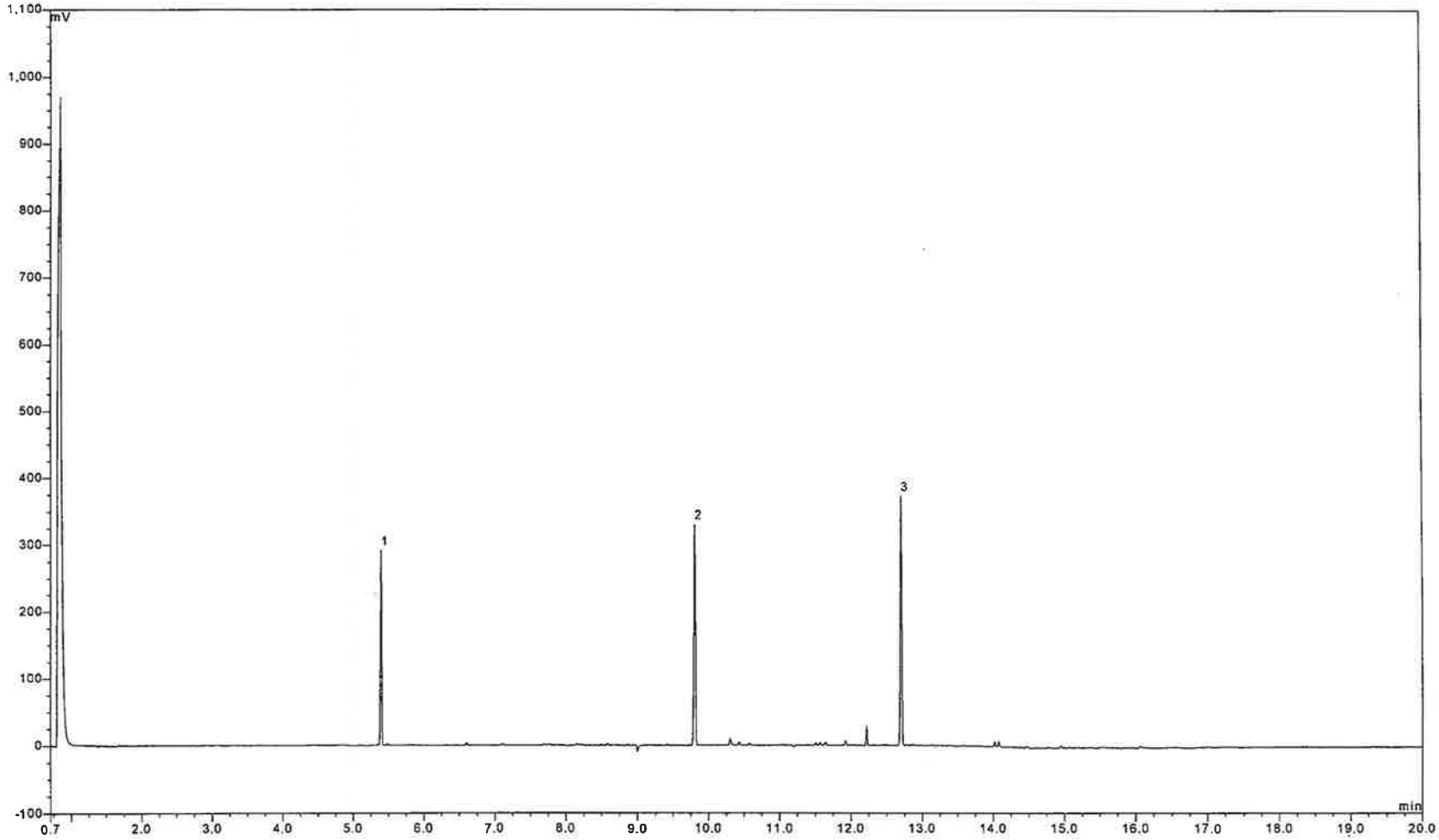
Internal Standards:

1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane

Lab Ref No: - S03024444
Sample Ref: - BH02
Depth(m) - -
-

Internal Standards:

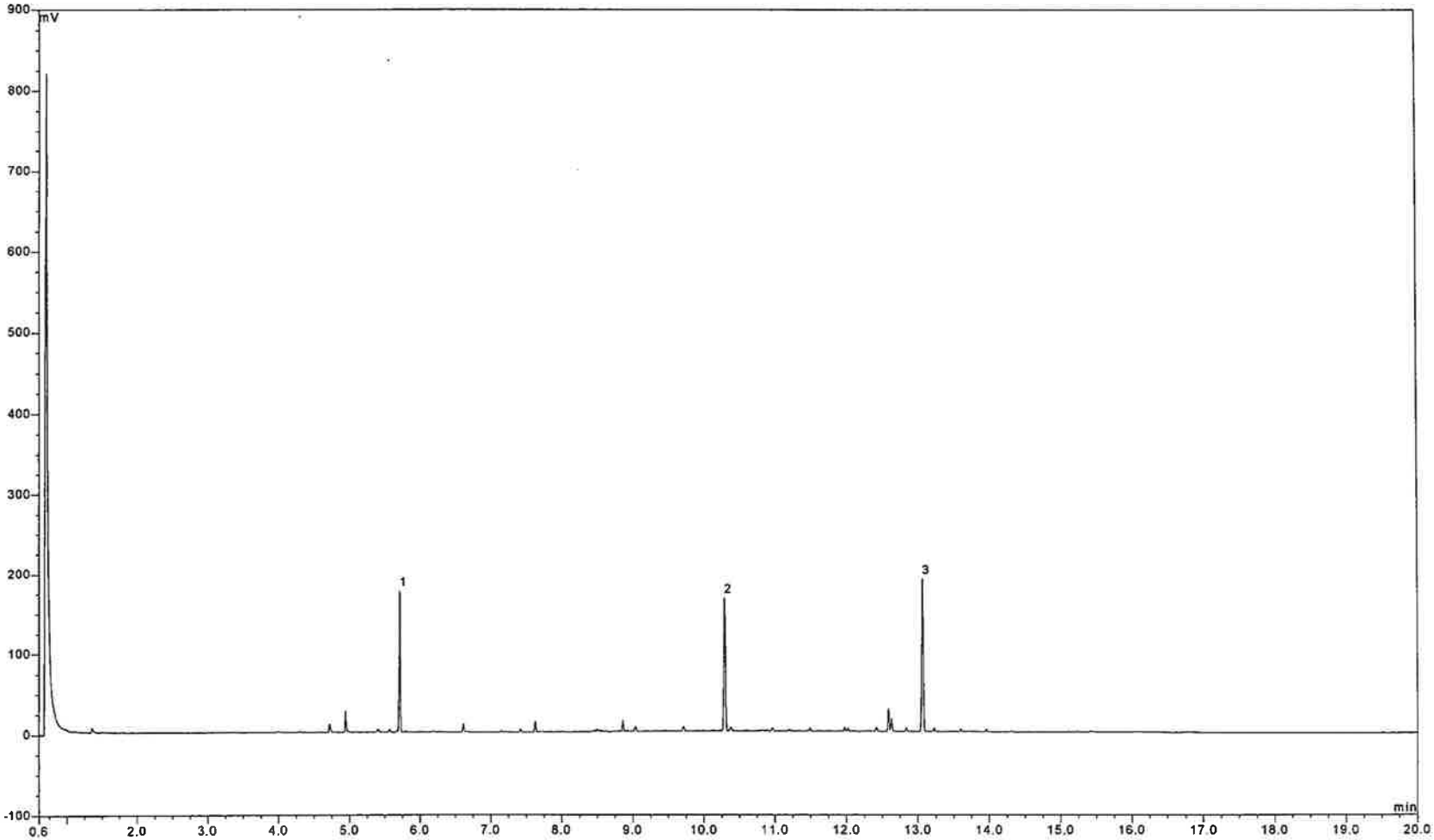
1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane



Lab Ref No: - S03024445
Sample Ref: - BH02
Depth(m) - -
-

Internal Standards:

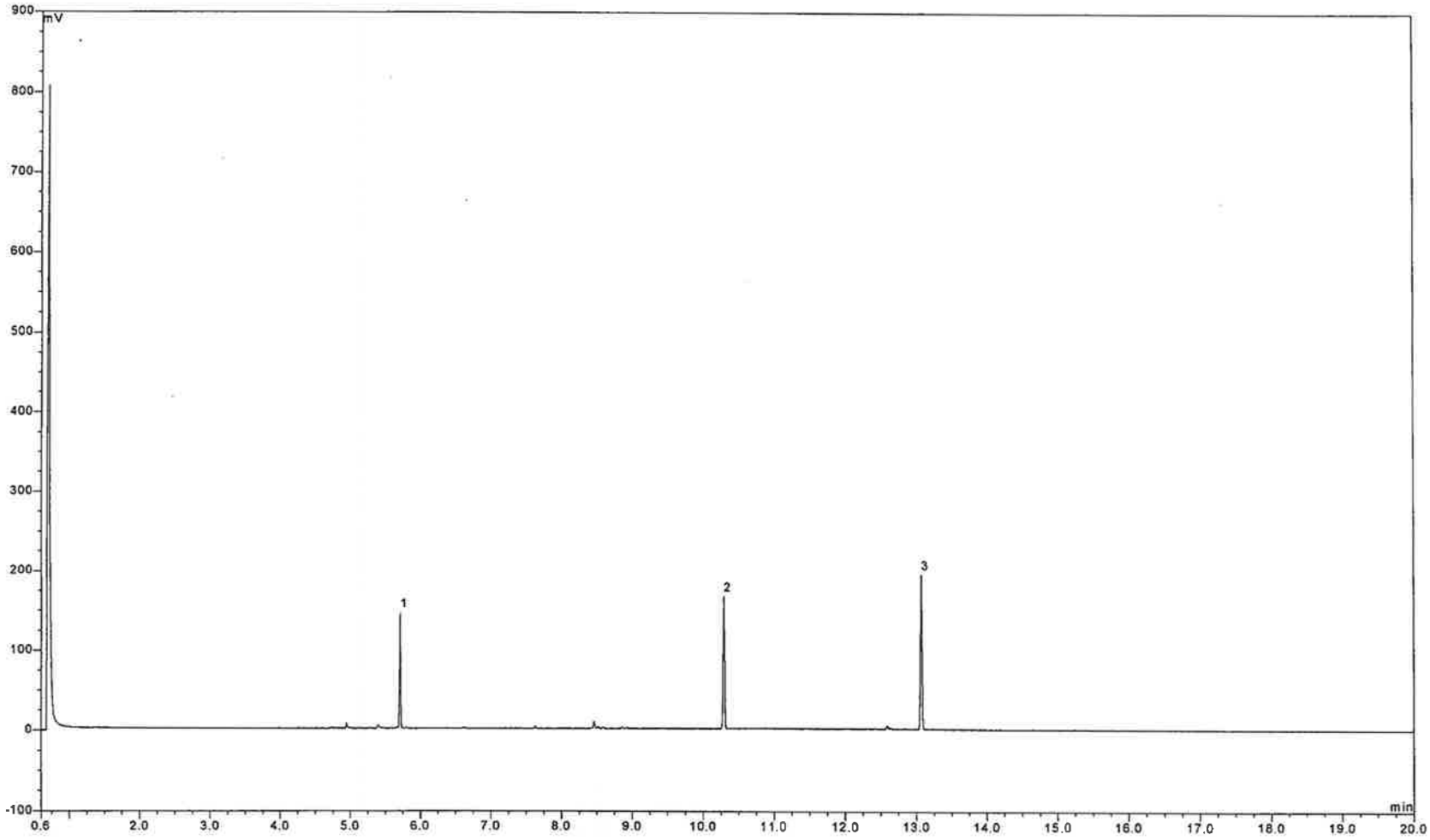
1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane



Lab Ref No: - S03024446
Sample Ref: - BH02
Depth(m) - -
-

Internal Standards:

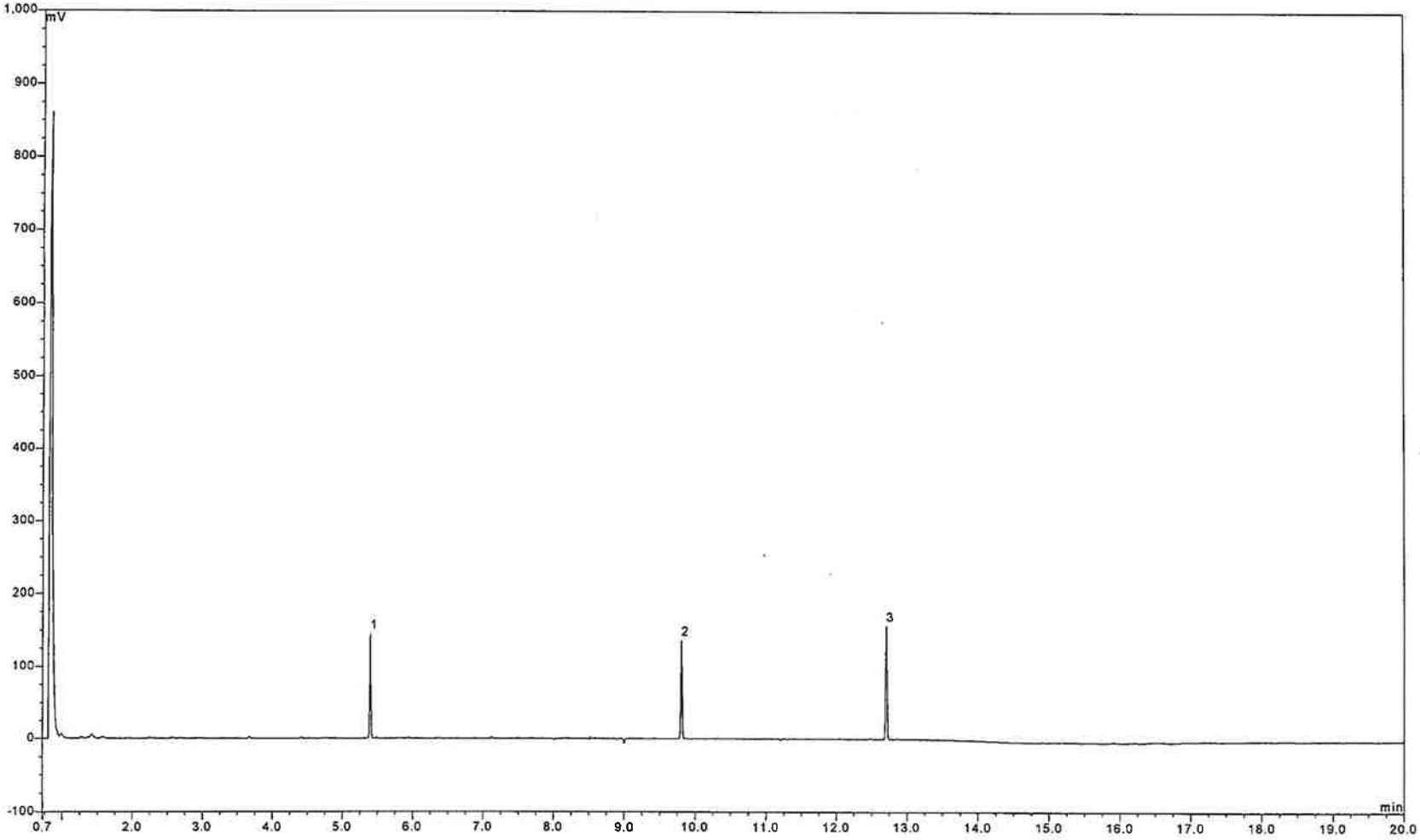
1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane



Lab Ref No: - S03024447
Sample Ref: - BH02
Depth(m) - -
-

Internal Standards:

1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane



ALcontrol Technichem

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Paul Gribble
WSP Environmental Limited
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Bulwell, Nottingham
NG6 8WA

27th October 2003

TEST REPORT

Our Report No: B03023263

Your Order No: 6014

4 no. water samples submitted for analysis on 15.10.2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Results enclosed: Pages 2-5

Laboratory analysis started on 15.10.2003
All laboratory analysis completed by 27th October 2003

Jodie Bettis
Senior Project Co-ordinator
ALCONTROL TECHNICHEM

Leigh Burton
Project Co-ordinator
ALCONTROL TECHNICHEM

Test Methods are Documented In House Procedures or where appropriate Standard Methods.
Non accredited tests (if applicable) are identified on each page. Procedures for sampling are outside the scope of the laboratory UKAS accreditation. Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.
All samples connected with this report, including any 'on hold', will be stored and disposed of according to Company policy. A copy of this policy is available on request.

TEST REPORT

WATER ANALYTICAL RESULTS

Our Report No: B03023263

Your Order No: 6014

CLIENT: WSP Environmental Limited

4 no. water samples submitted for analysis on 15.10.2003

DATE OF ISSUE: 27th October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:	S03025228	S03025229	S03025230	S03025231						
Sample Ref :	BH07	BH08	BH09	BH10						
Depth(m)	-	-	-	-						
009 pH	6.8	6.7	7.7	6.8						
033 Electrical Conductivity (µS/cm)	900	620	770	760						
016 Sulphate as SO_4	40	65	60	67						
014 Monohydric Phenol	<0.02	‡	<0.02	<0.02						
061 Total Cyanide	<0.03	<0.03	<0.03	<0.03						
*Dissolved Oxygen	4.8	5.3	5.0	5.0						
054 COD	<10	<10	<10	<10						
057 Ammonia as N	0.085	0.20	0.18	0.057						
016 Arsenic	<0.005	<0.005	<0.005	<0.005						
016 Cadmium	<0.001	<0.001	<0.001	<0.001						
016 Chromium	<0.01	<0.01	<0.01	<0.01						
016 Lead	<0.01	<0.01	<0.01	<0.01						
028 Mercury	<0.00005	<0.00005	<0.00005	<0.00005						
016 Selenium	<0.01	<0.01	<0.01	<0.01						
016 Copper	<0.005	<0.005	<0.005	<0.005						
016 Nickel	0.006	<0.005	<0.005	0.006						
016 Zinc	0.006	<0.005	<0.005	<0.005						

All results expressed in mg/l except for pH, unless stated ‡denotes insufficient sample available for analysis. * denotes analysis outside the scope of our UKAS accreditation

ALcontrol Technichem

TEST REPORT

WATER ANALYTICAL RESULTS - 040 VOC BY HEAD SPACE GC-MS Results in µg/l

Our Report No: B03023263

Your Order No: 6014

CLIENT: WSP Environmental Limited

4 no. water samples submitted for analysis on 15.10.2003

DATE OF ISSUE: 27th October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:	S03025228	S03025229	S03025230	S03025231						
Sample Ref :	**BH07**	**BH08**	**BH09**	**BH10**						
Depth(m)	-	-	-	-						
Vinyl chloride	<10	<10	<10	<10						
Chloroethane	<1	<1	<1	<1						
Trichlorofluoromethane	<1	<1	<1	<1						
1,1-Dichloroethene	<1	<1	<1	<1						
1,1,2-trichloro-1,2,2-trifluoroethane	<25	<25	<25	<25						
Dichloromethane	<25	<25	<25	<25						
trans-1,2 Dichloroethene	<1	<1	<1	<1						
MTBE	<1	<1	<1	<1						
1,1 -Dichloroethane	<1	<1	<1	<1						
cis-1,2 dichloroethene	<1	<1	<1	<1						
Chloroform	<1	<1	<1	<1						
1,1,1-Trichloroethane	<1	<1	<1	<1						
1,2-Dichloroethane	<1	<1	<1	<1						
Benzene	<1	<1	<1	<1						
Carbon tetrachloride	<1	<1	<1	<1						
Trichloroethene	<1	<1	<1	<1						
Bromodichloromethane	<1	<1	<1	<1						
cis-1,3 Dichloropropene	<1	<1	<1	<1						
Toluene	<1	<1	<1	<1						
trans-1,3 dichloropropene	<1	<1	<1	<1						
1,1,2-Trichloroethane	<1	<1	<1	<1						
Dibromochloromethane	<1	<1	<1	<1						
Tetrachloroethene	<1	<1	<1	<1						
Chlorobenzene	<1	<1	<1	<1						
Ethyl benzene	<1	<1	<1	<1						
m,p-Xylenes	<1	<1	<1	<1						
Bromoform	<1	<1	<1	<1						
o-Xylene	<1	<1	<1	<1						
1,1,2,2 Tetrachloroethane	<1	<1	<1	<1						
1,3,5 Trimethylbenzene	<1	<1	<1	<1						
1,2,4 Trimethylbenzene	<1	<1	<1	<1						
1,3 Dichlorobenzene	<1	<1	<1	<1						
1,4 Dichlorobenzene	<1	<1	<1	<1						
1,2 Dichlorobenzene	<1	<1	<1	<1						

TEST REPORT

WATER ANALYTICAL RESULTS - 053 SVOC BY GC-MS Results in µg/l

Our Report No: B03023263

Your Order No: 6014

CLIENT: WSP Environmental Limited

4 no. water samples submitted for analysis on 15.10.2003

DATE OF ISSUE: 27th October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

Lab Ref No:		S03025228	S03025229	S03025230	S03025231	
Sample Ref :		BH07	BH08	BH09	BH10	
Depth(m)		-	-	-	-	
PAH	naphthalene	<20	<20	<20	<20	
	2-chloronaphthalene	<20	<20	<20	<20	
	acenaphthylene	<30	<30	<30	<30	
	acenaphthene	<20	<20	<20	<20	
	fluorene	<30	<30	<30	<30	
	phenanthrene	<20	<20	<20	<20	
	anthracene	<20	<20	<20	<20	
	fluoranthene	<20	<20	<20	<20	
	pyrene	<20	<20	<20	<20	
	benz(a)anthracene	<20	<20	<20	<20	
	chrysene	<20	<20	<20	<20	
	benzo(b)fluoranthene	<25	<25	<25	<25	
	benzo(k)fluoranthene	<20	<20	<20	<20	
	benzo(a)pyrene	<25	<25	<25	<25	
	indeno(123-cd)pyrene	<40	<40	<40	<40	
	dibenzo(ah)anthracene	<40	<40	<40	<40	
	benzo(ghi)perylene	<40	<40	<40	<40	
PHENOLS	phenol	<20	<20	<20	<20	
	2-chlorophenol	<20	<20	<20	<20	
	2-methylphenol	<20	<20	<20	<20	
	4-methylphenol	<20	<20	<20	<20	
	2-nitrophenol	<20	<20	<20	<20	
	2,4-dimethylphenol	<20	<20	<20	<20	
	2,4-dichlorophenol	<20	<20	<20	<20	
	2,6-dichlorophenol	<20	<20	<20	<20	
	4-chloro-3-methyl phenol	<20	<20	<20	<20	
	2,4,6-trichlorophenol	<20	<20	<20	<20	
	2,4,5-trichlorophenol	<20	<20	<20	<20	
	4-nitrophenol	<50	<50	<50	<50	
	2,3,4,6-tetrachlorophenol	<30	<30	<30	<30	
	pentachlorophenol	<60	<60	<60	<60	
PHTHALATES	dimethylphthalate	<20	<20	<20	<20	
	diethyl phthalate	<20	<20	<20	<20	
	di-n-butyl phthalate	<30	<30	<30	<30	
	butyl benzyl phthalate	<60	<60	<60	<60	
ETHERS	bis(2-chloroethyl)ether	<15	<15	<15	<15	
	bis(2-chloroisopropyl)ether	<10	<10	<10	<10	
	4-chlorophenyl phenyl ether	<15	<15	<15	<15	
	bromo phenyl phenyl ether	<30	<30	<30	<30	
BENZENES	1,3-dichlorobenzene	<15	<15	<15	<15	
	1,2-dichlorobenzene	<10	<10	<10	<10	
	1,4-dichlorobenzene	<10	<10	<10	<10	
	nitrobenzene	<20	<20	<20	<20	
	1,2,4-trichlorobenzene	<10	<10	<10	<10	
	2,6-dinitrotoluene	<20	<20	<20	<20	
	2,4-dinitrotoluene	<20	<20	<20	<20	
	azobenzene	<30	<30	<30	<30	
	hexachlorobenzene	<20	<20	<20	<20	
OTHERS	hexachloroethane	<15	<15	<15	<15	
	n-nitroso-di-n-propyl-1-propanamine	<40	<40	<40	<40	
	isophorone	<20	<20	<20	<20	
	bis(2-chloroethoxy)methane	<15	<15	<15	<15	
	hexachlorobutadiene	<10	<10	<10	<10	
	anthraquinone	<30	<30	<30	<30	
	aniline	<40	<40	<40	<40	

TEST REPORT

Our Report No: B03023263

Your Order No: 6014

CLIENT: WSP Environmental Limited

4 no. water samples submitted for analysis on 15.10.2003

DATE OF ISSUE: 27th October 2003

Project Name: MOD Records Office, Bourne Avenue

Project Code: 12170423 (E17/DC835)

WATER - RESULTS

Lab Ref No:	Sample Ref:	Depth(m)	*PRO by GC-MS (C_6-C_{10})	†*Hydrocarbon Broadscan		Description
				DRO (C_{10}-C_{24})	Mineral Oils (C_{24}-C_{40})	
S03025228	BH07	-	<1	0.7	<0.1	The sample chromatogram exhibits a trace consistent with a degraded diesel,
S03025229	BH08	-	<1	‡	‡	‡
S03025230	BH09	-	<1	#	#	#
S03025231	BH10	-	<1	<0.1	<0.1	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.

NOTE:

(i) †This method provides information only on Gas Chromatograph (GC) amenable material with elutions ranging between 40°C and 325°C.

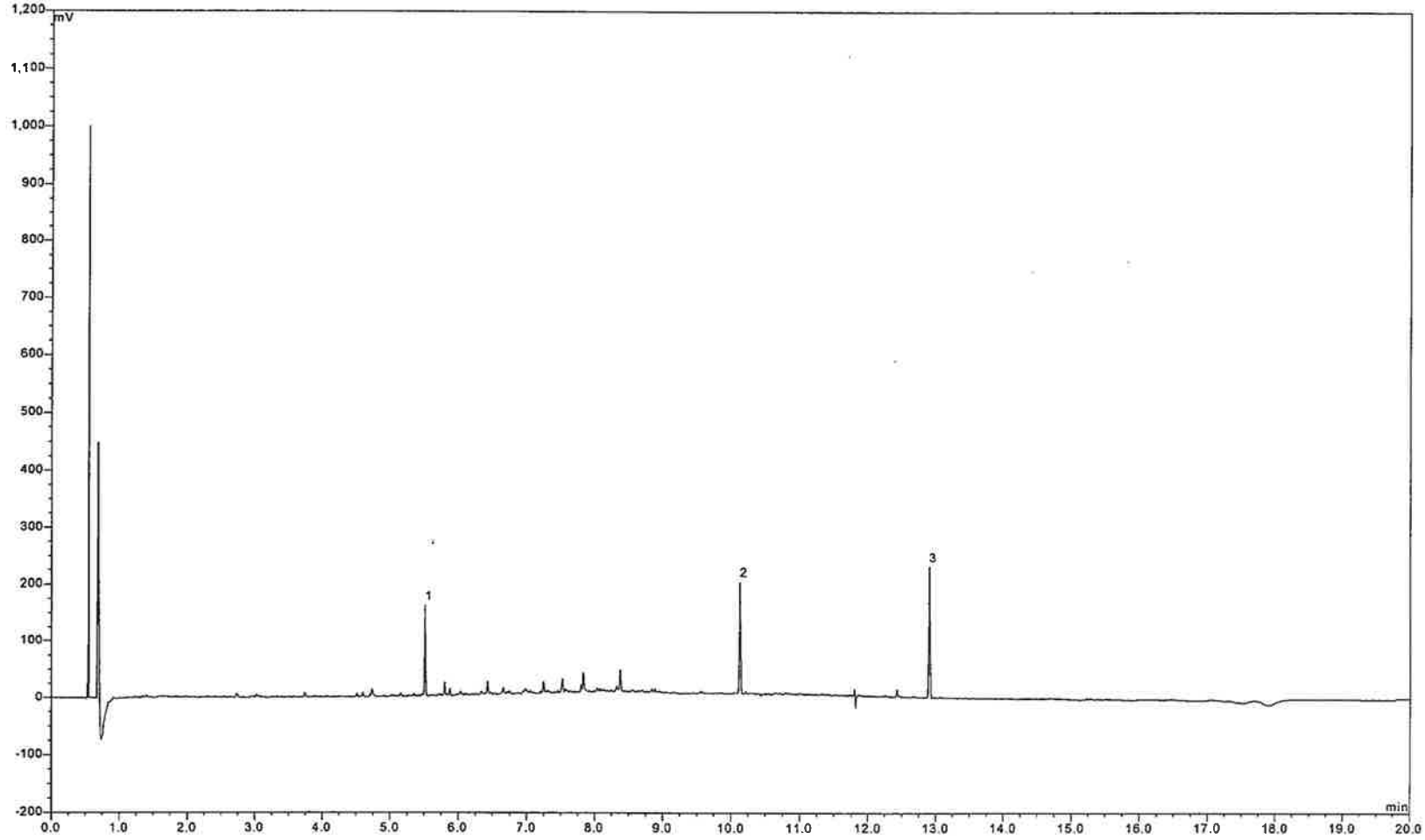
(ii) The results are expressed as mg/l.

#denotes unsuitable for analysis due to nature of sample.
‡denotes insufficient sample available for analysis.
*Denotes analysis outside the scope of our UKAS accreditation.

Lab Ref No: - S03025228
Sample Ref: - BH07
Depth(m) - -
-

Internal Standards:

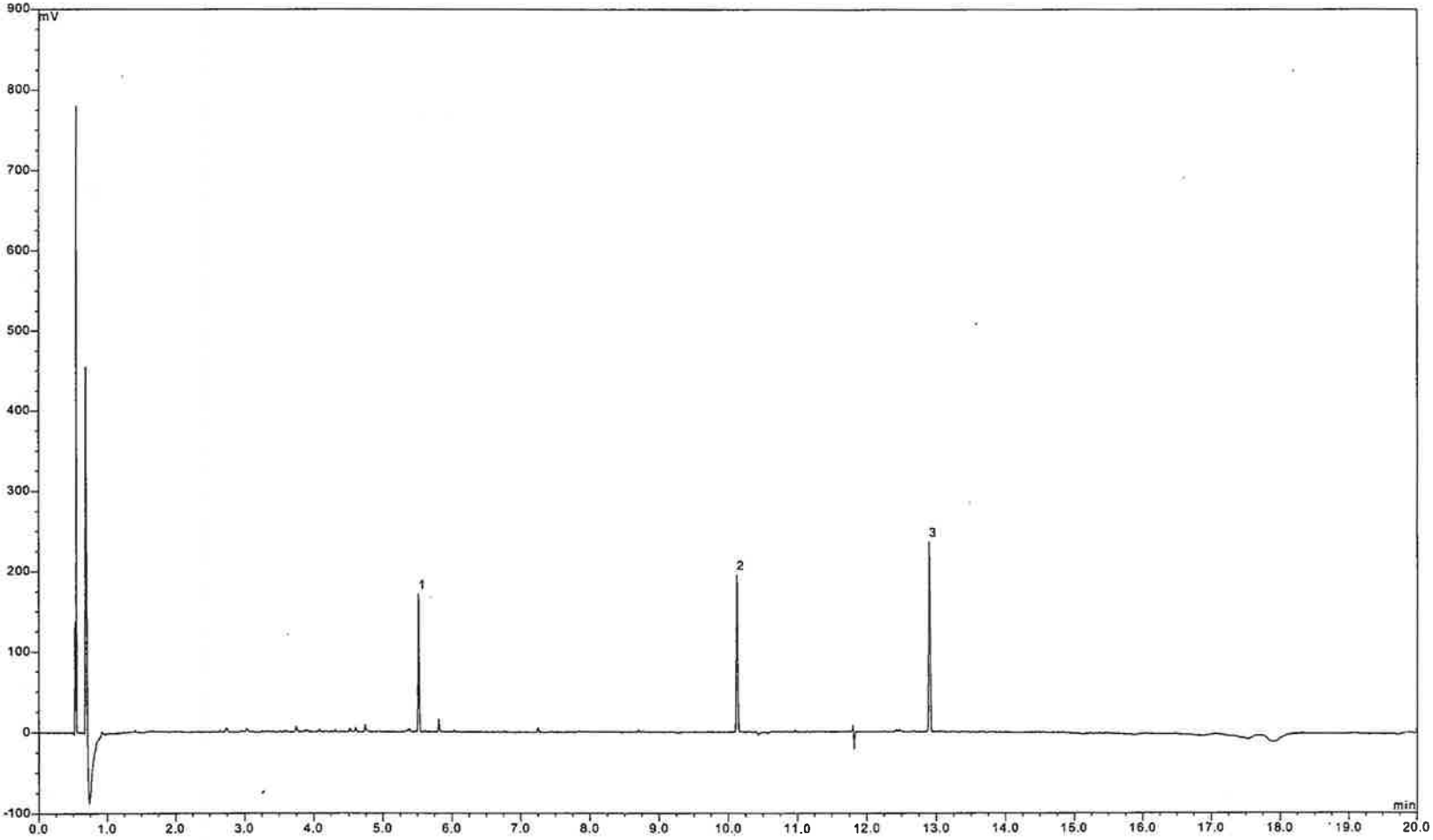
1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane



Lab Ref No: - S03025231
Sample Ref: - BH10
Depth(m) - -
-

Internal Standards:

1 = heptamethylnonane
2 = chlorooctadecane
3 = squalane



Appendix F

Geotechnical Data

Lab No.: 03/1016/S Project No.: 12170423

WSP

Client:	Prologis	Address:	Kingspark House 1 Monkspath Hall Road Solihull West Midlands
		Date of receipt:	16/10/03

Report of Soils Laboratory Testing at MOD Hayes, Bourne Lane, Hayes, Middlesex.

APPROVED FOR ISSUE

..... DATE 11-11-03

CHECKED BY ..... DATE 11-11-03

APPROVED SIGNATORY

☑ G Richards
Soils Laboratory Manager

☐ S Southam
Senior Soils Technician

Soils Laboratory testing carried out to BS 1377: 1990 unless otherwise stated. All soils laboratory testing is subject to quality control procedures. Samples taken to BS5930 : 1999. All information supplied by E-mail may be subject to error during transfer. For the authoritative test results refer to hard copy of report.

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Offices worldwide

WSP
ENVIRONMENTAL

SITE/PROJECT : MOD Hayes, Bourne Lane, Hayes, Middlesex.
LAB NO : 03/1016/S
PROJECT NO: 12170423

SUMMARY OF TEST RESULTS

BORE HOLE	SAMPLE	DEPTH (m)	STORE REF.	CLASSIFICATION : BS 1377 : PART 2 : 1990						
				w %	w_L %	w_P %	I_P %	<425 µm	ρs Mg/m^3	Sym
1	1	1.00	S88211	12	35	11	24	90	-	CI
1	2	5.40	S88193	31	76	29	47	85	-	CV
2	4	4.50	S88257	22	80	27	53	96	-	CV
3	7	5.70	S88229	27	81	27	54	82	-	CV
4	9	4.00	S88216	26						
TP1	12	2.50	S88176	9.3						

NOTES :

U = UNDISTURBED
D = DISTURBED
B = BULK

w = MOISTURE CONTENT
w_L = LIQUID LIMIT
w_P = PLASTIC LIMIT
NP = NON PLASTIC

I_P = PLASTICITY INDEX
<425µm = % PASSING 425µm SIEVE
ρs = PARTICLE DENSITY
Sym = PLASTICITY CHART :BS5930:1981

IS = INSUFFICIENT SAMPLE MASS TO CARRY OUT ANALYSIS

Approved for Issue

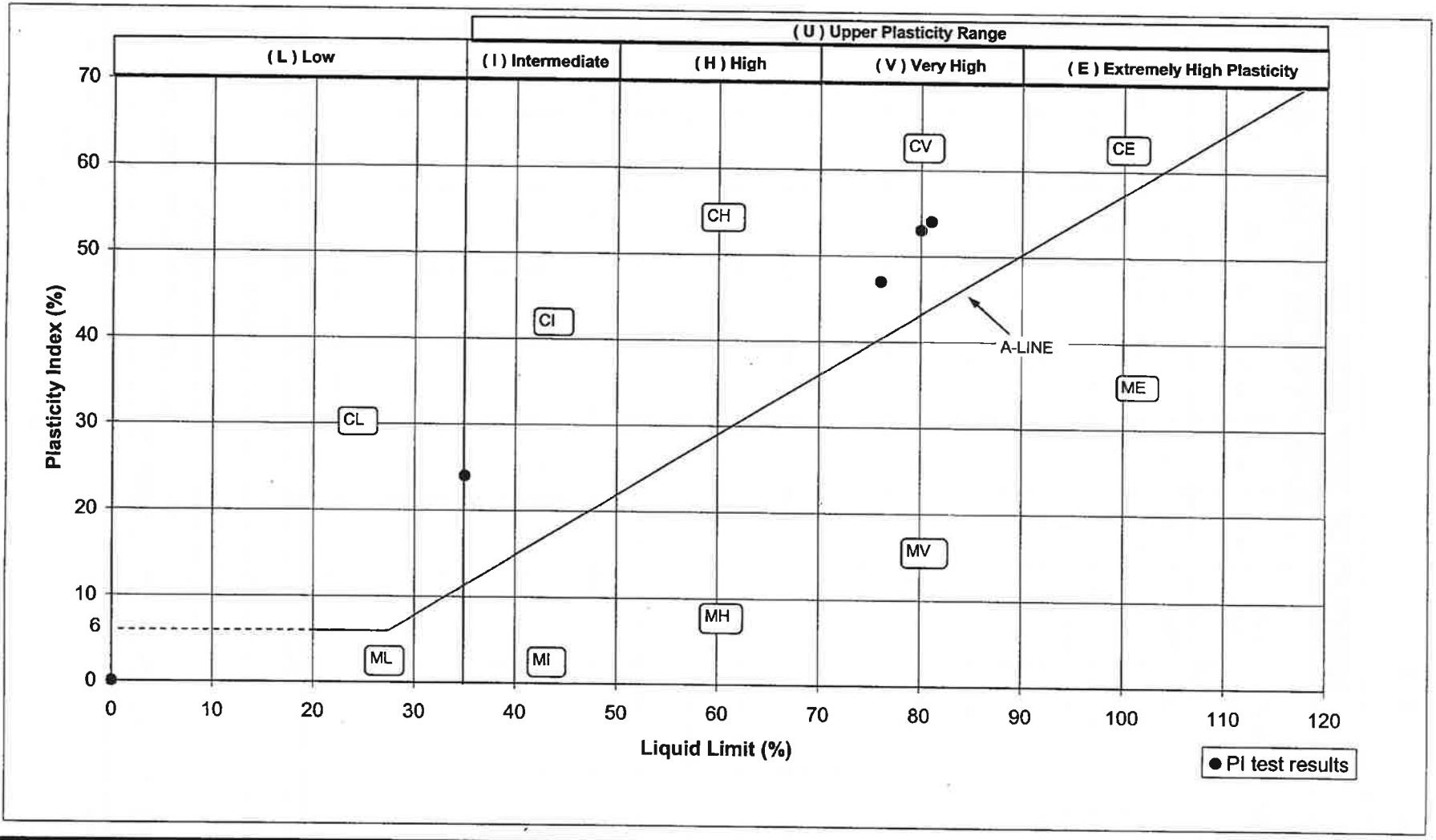
Date 11-11-03

Approved Signatory
☑ G Richards
Soils Laboratory Manager
☐ S Southam
Senior Soils Technician

PLASTICITY CHART TAKEN FROM BS5930 : 1999

PROJECT :	MOD Hayes, Bourne Lane, Hayes, Middlesex.
PROJECT NUMBER :	12170423

WSP
ENVIRONMENTAL



Approved for Issue

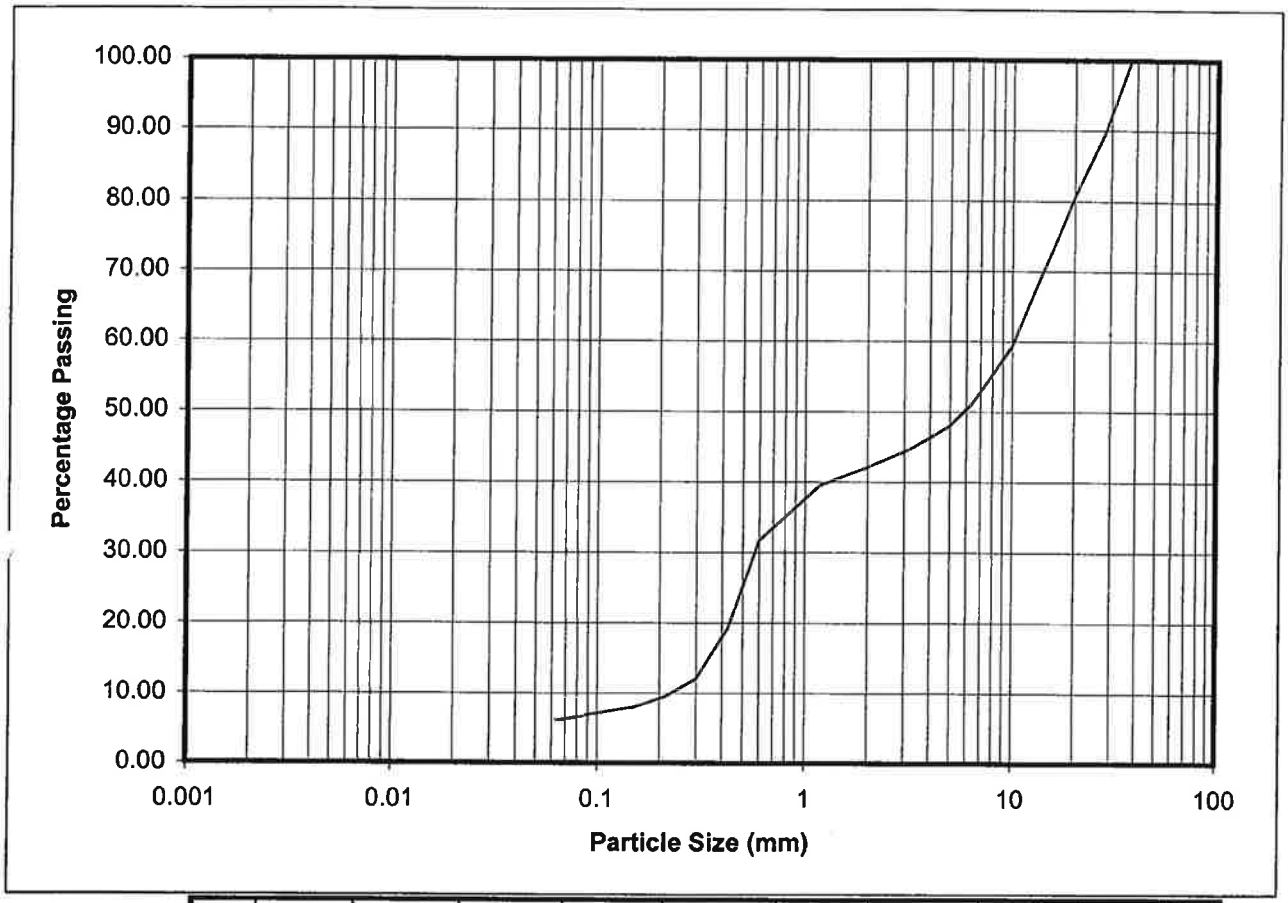
Date 11-11-03

Approved Signatory
☑ G Richards
Soils Laboratory Manager
☐ S Southam
Senior Soils Technician

PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: 1990

WSP ENVIRONMENTAL

PROJECT :	MOD Hayes	SAMPLE	TP1	LAB NO :	03/1016/S
PROJECT NUMBER :	12170423	DEPTH(m)	2.50	STORE NO:	S88176
DESCRIPTION :	Brown silty/clayey very sandy GRAVEL				



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	*
	SILT			SAND			GRAVEL			

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	89.65
20.00	80.61
14.00	69.75
10.00	59.30
6.300	50.95
5.000	48.01
3.350	44.92
2.000	42.05
1.180	39.53
0.600	31.71
0.425	19.17
0.300	12.03
0.212	9.48
0.150	7.93
0.063	6.17

PARTICLE DIAMETER (mm)	% PASSING
2.00	42.05
0.063	6.17

SOIL FRACTION	TOTAL %
GRAVEL	57.95
SAND	35.87
SILT OR CLAY	6.17

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

Approved for Issue

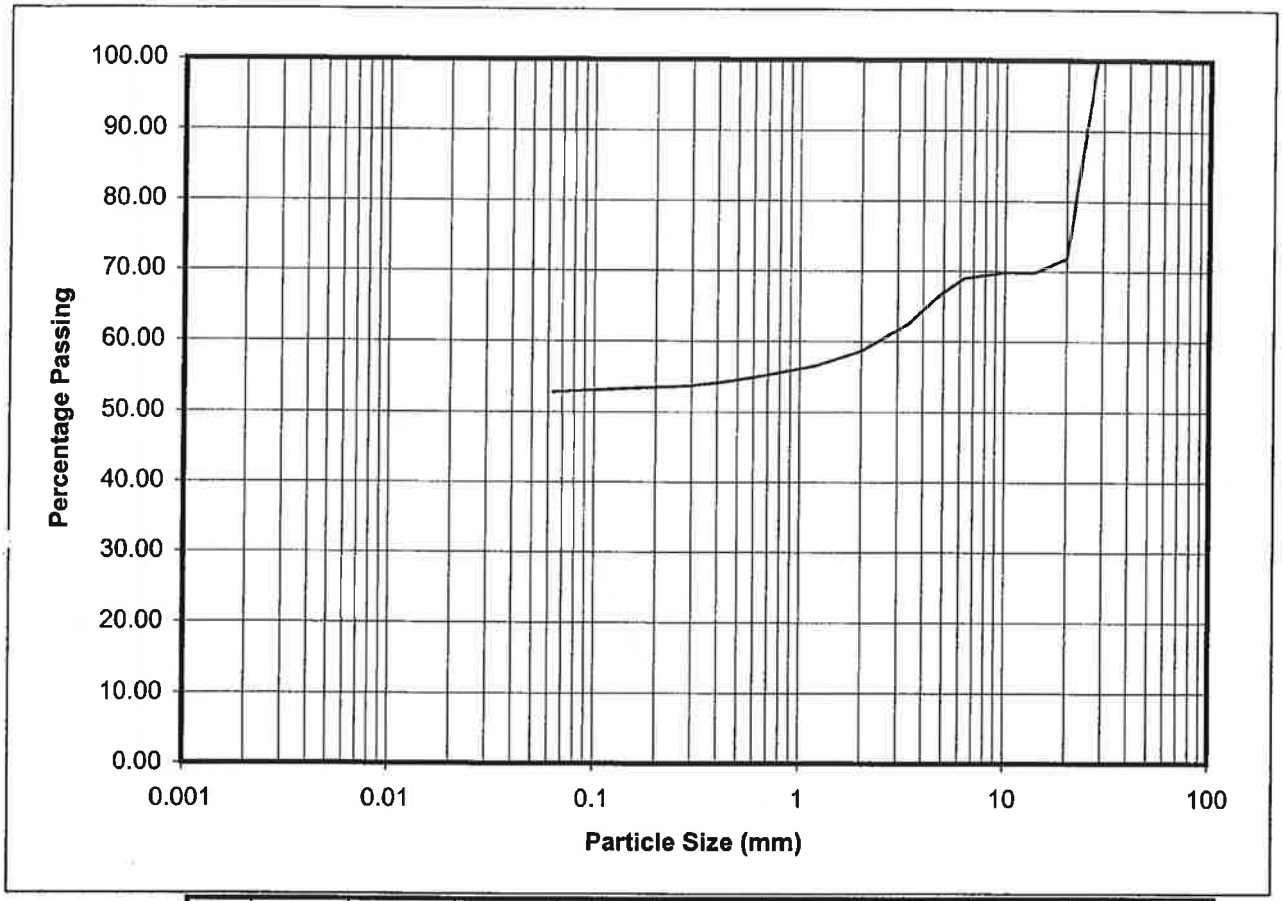
Date 11-11-03

Approved Signatory
- [x] G Richards, Soils Laboratory Manager
- [ ] S Southam, Senior Soils Technician

PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: 1990

WSP ENVIRONMENTAL

PROJECT :	MOD Hayes	SAMPLE	BH4	LAB NO :	03/1016/S
PROJECT NUMBER :	12170423	DEPTH(m)	3.70	STORE NO:	S88205
DESCRIPTION :	Brown very gravelly sandy SILT/CLAY				



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	71.77
14.00	69.80
10.00	69.80
6.300	68.95
5.000	66.95
3.350	62.36
2.000	58.63
1.180	56.51
0.600	54.91
0.425	54.20
0.300	53.70
0.212	53.46
0.150	53.32
0.063	52.78

PARTICLE DIAMETER (mm)	% PASSING
2.00	58.63
0.063	52.78

SOIL FRACTION	TOTAL %
GRAVEL	41.37
SAND	5.85
SILT OR CLAY	52.78

NOTES:

*** SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES**

Approved for Issue

Date 11-11-03

Approved Signatory

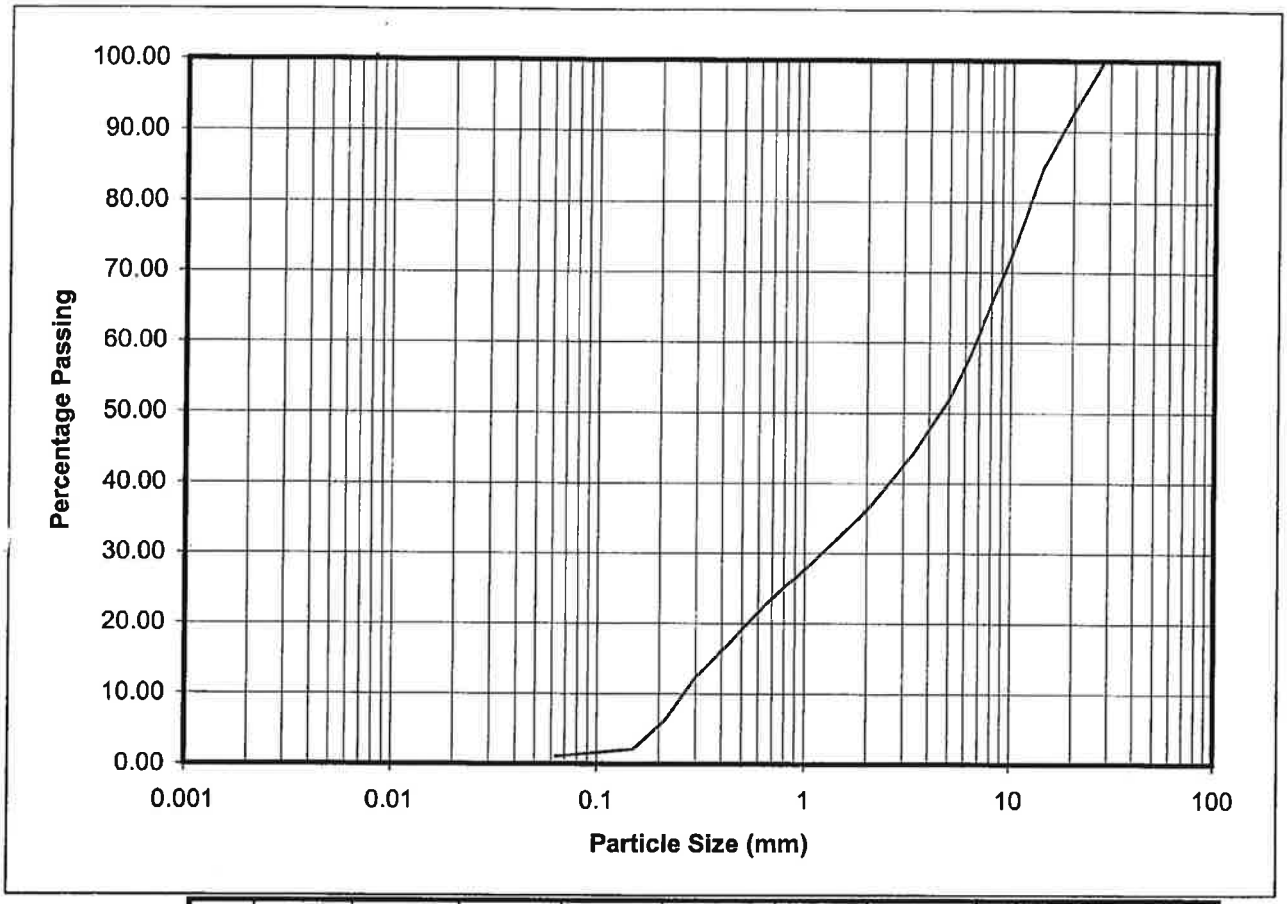
☑ G Richards
Soils Laboratory Manager

☐ S Southam
Senior Soils Technician

PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: 1990

WSP ENVIRONMENTAL

PROJECT :	MOD Hayes	SAMPLE	BH3	LAB NO :	03/1016/S
PROJECT NUMBER :	12170423	DEPTH(m)	2.40	STORE NO:	S88167
DESCRIPTION :	Brown slightly silty/clayey very sandy GRAVEL				



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	*
	SILT			SAND			GRAVEL			

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	92.80
14.00	84.71
10.00	72.31
6.300	57.87
5.000	51.82
3.350	44.22
2.000	36.13
1.180	29.65
0.600	21.56
0.425	16.92
0.300	12.34
0.212	6.08
0.150	2.07
0.063	1.08

PARTICLE DIAMETER (mm)	% PASSING
2.00	36.13
0.063	1.08

SOIL FRACTION	TOTAL %
GRAVEL	63.87
SAND	35.04
SILT OR CLAY	1.08

NOTES:

*** SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES**

Approved for Issue

Date 11-11-03

Approved Signatory

☑ G Richards
Soils Laboratory Manager

☐ S Southam
Senior Soils Technician

WSP
ENVIRONMENTAL

SITE/PROJECT : MOD Hayes, Bourne Lane, Hayes, Middlesex.
LAB NO : 03/1016/S
JOB NO : 12170423

SUMMARY OF TEST RESULTS

BORE HOLE	SAMPLE	DEPTH (m)	STORE REF.	Chemical - BS1377:Part 3:1990				
				ph	SO_4 in soil g/l	SO_4 in water g/l	L.o.i %	Design sulfate class for site
3	6	2.40	S88167	8.0	< 0.05			DS-1
4	8	3.70	S88205	8.2	< 0.05			DS-1

NOTES :
L.o.i = LOSS ON IGNITION
SO_4 = SULFATE (water soluble)
U = UNDISTURBED SAMPLE, D = DISTURBED, B = BULK.
(T) = SAMPLE WAS TURBID AND UNABLE TO BE TESTED FOR SULFATE
DESIGN SULFATE CLASS FOR SITE TAKEN FROM BRE SPECIAL DIGEST 1 : PART 1

Approved for Issue

E. C. S

Date 11-11-03

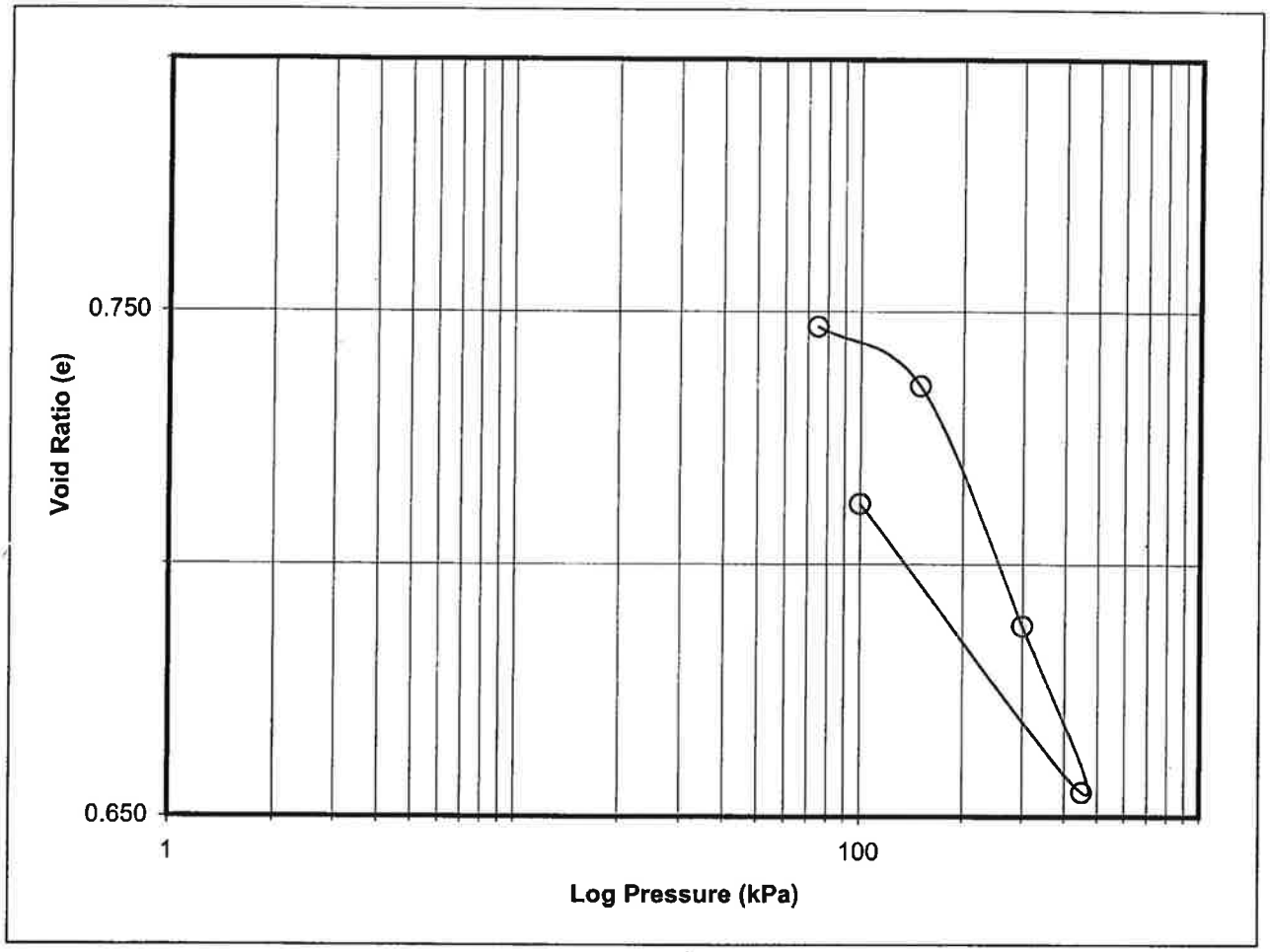
Approved Signatory
☑ G Richards
Soils Laboratory Manager
☐ S Southam
Senior Soils Technician

ONE DIMENSIONAL CONSOLIDATION TEST : BS1377 : PART 5: 1990 : CLAUSE 3

Notes : Log Time Method of Fitting

WSP ENVIRONMENTAL

PROJECT :	MOD Hayes, Middlesex	**SAMPLE**	BH4/U	**LAB NO :**	03/1016/S
PROJECT NUMBER :	12170423	**DEPTH(m)**	5.00-5.45	**STORE NO:**	S88146
DESCRIPTION :	Grey silty CLAY				



SAMPLE DETAILS		
INITIAL HEIGHT (mm)	19.00	
DIAMETER (mm)	75.00	
PARTICLE DENSITY	2.70	(ASSUMED)

CONDITIONS	INITIAL	FINAL
MOISTURE CONTENT %	27.0	29
BULK DENSITY Mg/m^3	1.94	2.03
DRY DENSITY Mg/m^3	1.53	1.58
VOID RATIO e	0.769	0.714
DEGREE OF SATURATION %	94.8	100

LABORATORY COEFFICIENTS		
PRESSURE kPa	M_v (m^2/MN)	C_v (m^2/year)
75	0.1670	10.30
150	0.0895	0.57
300	0.1821	0.35
450	0.1306	0.27
100	0.0987	0.22

Approved for Issue

Date 16-11-03

Approved Signatory

☑ G Richards
Soils Laboratory Manager

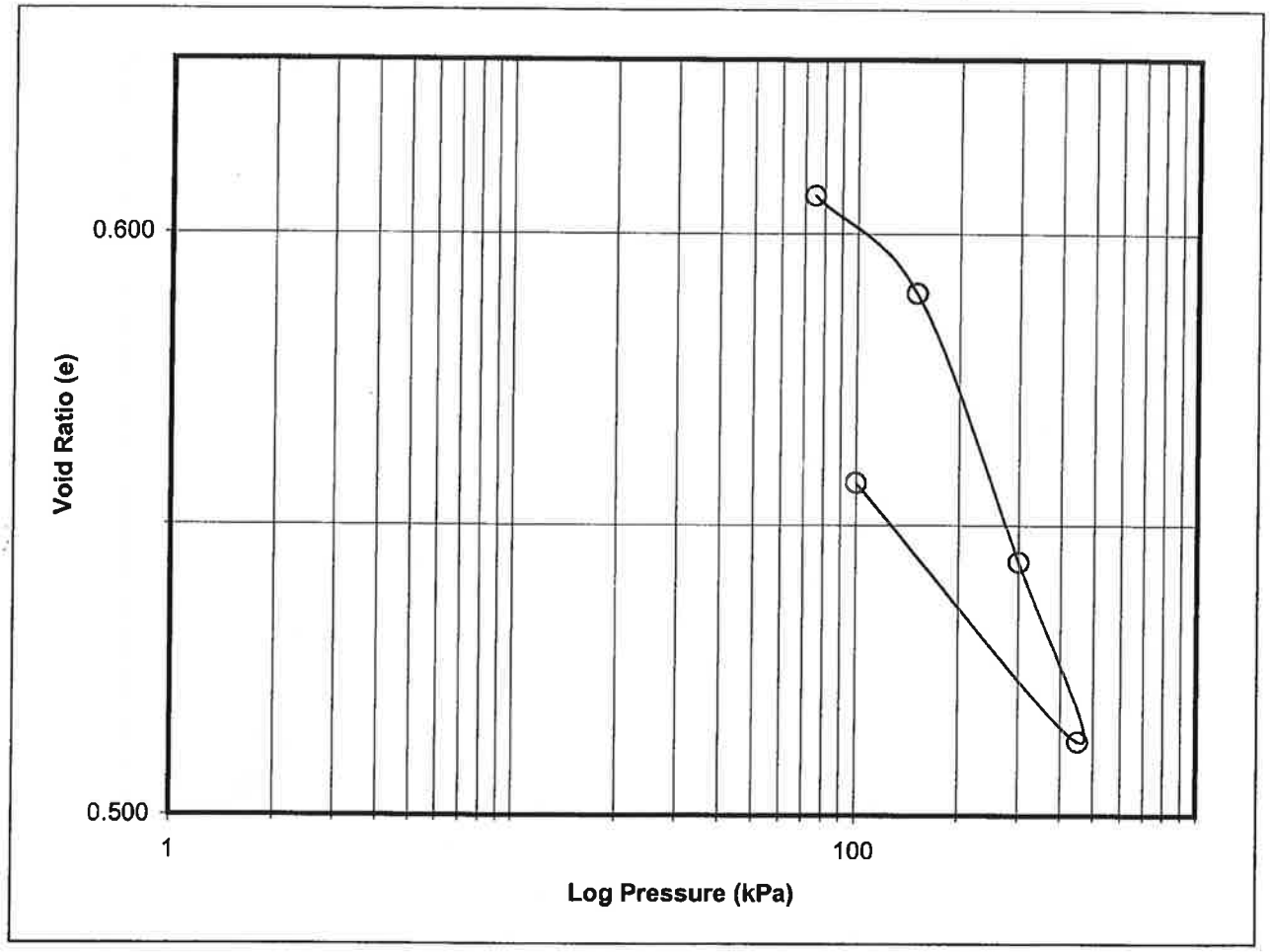
☐ S Southam
Senior Soils Technician

ONE DIMENSIONAL CONSOLIDATION TEST : BS1377 : PART 5: 1990 : CLAUSE 3

Notes : Log Time Method of Fitting

WSP ENVIRONMENTAL

PROJECT :	MOD Hayes, Middlesex	**SAMPLE**	BH1/U	**LAB NO :**	03/1016/S
PROJECT NUMBER :	12170423	**DEPTH(m)**	6.50-6.95	**STORE NO:**	S88148
DESCRIPTION :	Grey silty CLAY				



SAMPLE DETAILS		
INITIAL HEIGHT (mm)	19.00	
DIAMETER (mm)	75.00	
PARTICLE DENSITY	2.70	(ASSUMED)

CONDITIONS	INITIAL	FINAL
MOISTURE CONTENT %	23.0	25
BULK DENSITY Mg/m^3	2.03	2.17
DRY DENSITY Mg/m^3	1.65	1.74
VOID RATIO e	0.637	0.553
DEGREE OF SATURATION %	97.5	100

LABORATORY COEFFICIENTS		
PRESSURE kPa	M_v (m^2/MN)	C_v (m^2/year)
75	0.2477	9.21
150	0.1394	5.59
300	0.1929	0.93
450	0.1336	0.48
100	0.0840	0.59

Approved for Issue

Date 11-11-03

Approved Signatory

☑ G Richards
Soils Laboratory Manager

☐ S Southam
Senior Soils Technician

WSP
GEOTECHNICS

SITE/PROJECT : MOD Hayes, Bourne Lane, Hayes, Middlesex.
LAB NO : 03/1016/S
JOB NO : 12170423

SUMMARY OF TEST RESULTS

BORE HOLE	SAMPLE	DEPTH (m)	STORE REF.	QU Triaxial Compression - BS1377 : Part 7 : 1990					
				TEST	σ_3 kPa	$\sigma_1 - \sigma_3$ kPa	Cu kPa	φ_u Deg°	MODE OF FAIL
1	U	6.50-6.95	S88148	M	400	166			
					600	172			
					800	189	65	2	B
4	U	5.00-5.45	S88146	M	400	114			
					600	130			
					800	143	40	2	B

NOTES :

U = UNDISTURBED
D = DISTURBED
B = BULK
C = COMPOUND
P = PLASTIC
B = BRITTLE
* = ASSUMED ZERO

σ_3 = CELL PRESSURE
σ_1-σ_3 = DEVIATOR STRESS
Cu = APPARENT COHESION
φu = ANGLE OF SHEARING RESISTANCE
Q = IMMEDIATE UNDRAINED
M = MULTISTAGE
E = EFFECTIVE STRESS

V = HAND SHEAR VANE

Approved for Issue

Date 11-11-03

Approved Signatory
☑ G Richards
Soils Laboratory Manager
☐ S Southam
Senior Soils Technician

WSP
GEOTECHNICS

SITE/PROJECT : MOD Hayes, Bourne Lane, Hayes, Middlesex.
LAB NO : 03/1016/S
JOB NO : 12170423

SUMMARY OF TEST RESULTS

BORE HOLE	SAMPLE	DEPTH (m)	STORE REF.	QU Triaxial Densities BS1377 : Part 7 : 1990		
				w %	Bulk density (ρ) (Mg/m³)	Dry density (ρd) (Mg/m³)
1	U	6.50-6.95	S88148	26	2.03	1.61
4	U	5.00-5.45	S88146	27	1.86	1.46

NOTES :
1: (w) Moisture content determination using method specified in BS 1377 : 1990 : Part 2.

Approved for Issue

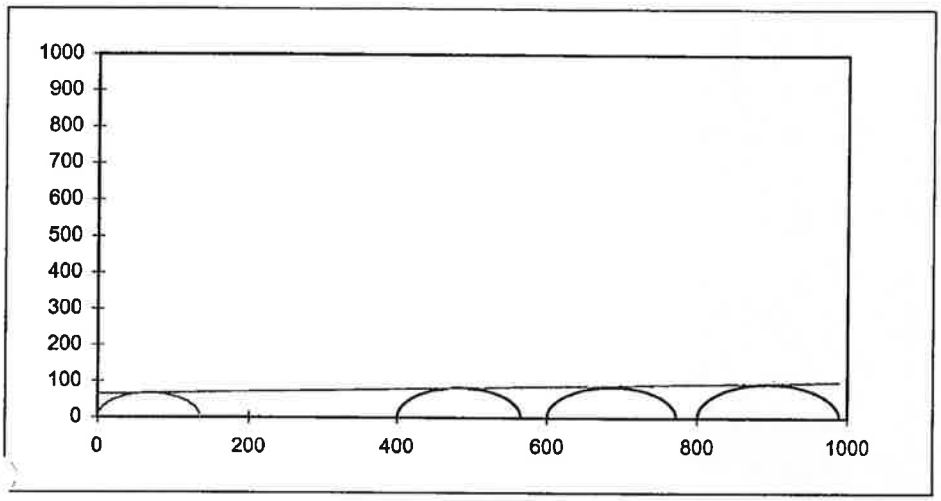
Date 11/11/03

Approved Signatory
☑ G Richards
Soils Laboratory Manager
☐ S Southam
Senior Soils Technician

WSP
ENVIRONMENTAL

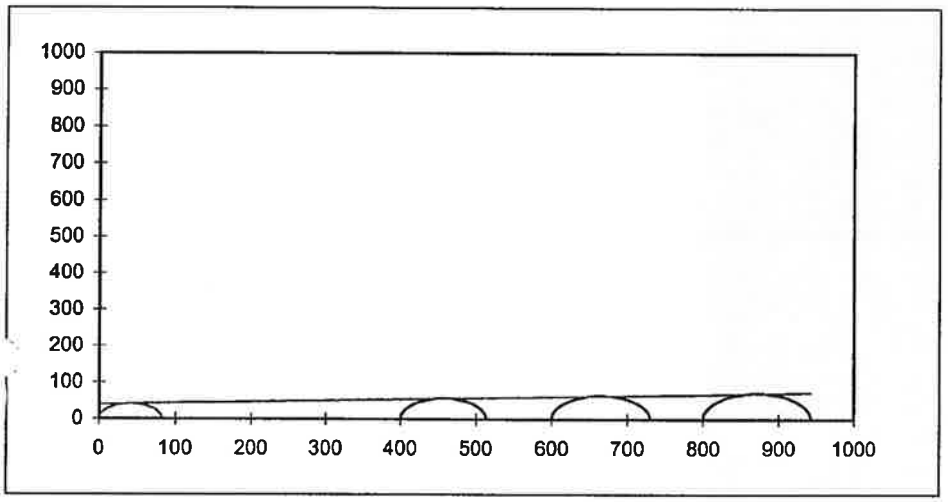
SITE/PROJECT : MOD Hayes, Bourne Lane, Hayes, Middlesex.
LAB NO : 03/1016/S
JOB NO : 12170423

QUICK UNDRAINED TRIAXIALS WITHOUT PORE WATER MEASUREMENT - MOHR CIRCLE PLOTS



BEST FIT: PARAMETERS	
Cu =	65 kpa
ϕ =	2 °

BH1 6.50-6.95



BEST FIT: PARAMETERS	
Cu =	40 kpa
ϕ =	2 °

BH4 5.00-5.45

Approved for Issue

Date 11-11-05

Approved Signatory

☑ G Richards
Soils Laboratory Manager

☐ S Southam
Senior Soils Technician

DAVENTRY
GLASGOW
MAIDSTONE
MANCHESTER
NEWCASTLE
UXBRIDGE
WALSALL

TEST REPORT

FOR

WSP ENVIRONMENTAL

AT

MOD, BOURNE AVENUE, HAYES, MIDDLESEX

Job No.: UL 20506/M1

Report No.: H46914

Date : 29 September 2003

BUREAU VERITAS 1828

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WEEKS LABORATORIES

UKAS TESTING 0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental **Report No. : H 46914**

Site : MOD, Bourne Avenue, Hayes, Middlesex

Contact : Karen Storey **Job No. : UL 20506/M1**

Sample Information

Location : 1	**Uxbridge Laboratory Reference : M 71387 / 1**
Soil Sample Description: CLAY	**Client Reference : 1**
Depth of Water Table (m) : N/K Test Depth (m) : 0.5	**Rate of Loading (mm/min) : 1.0 ± 0.2**
Description of Reaction : WEEKS Vehicle	**Maximum Size of Aggregate greater than 20 mm : Yes**
Environmental Conditions : Sunny	**Environmental Temperature (°C) : 18**

Test Data

Moisture Content (%) : 12 Test Date : 29-Sep-03

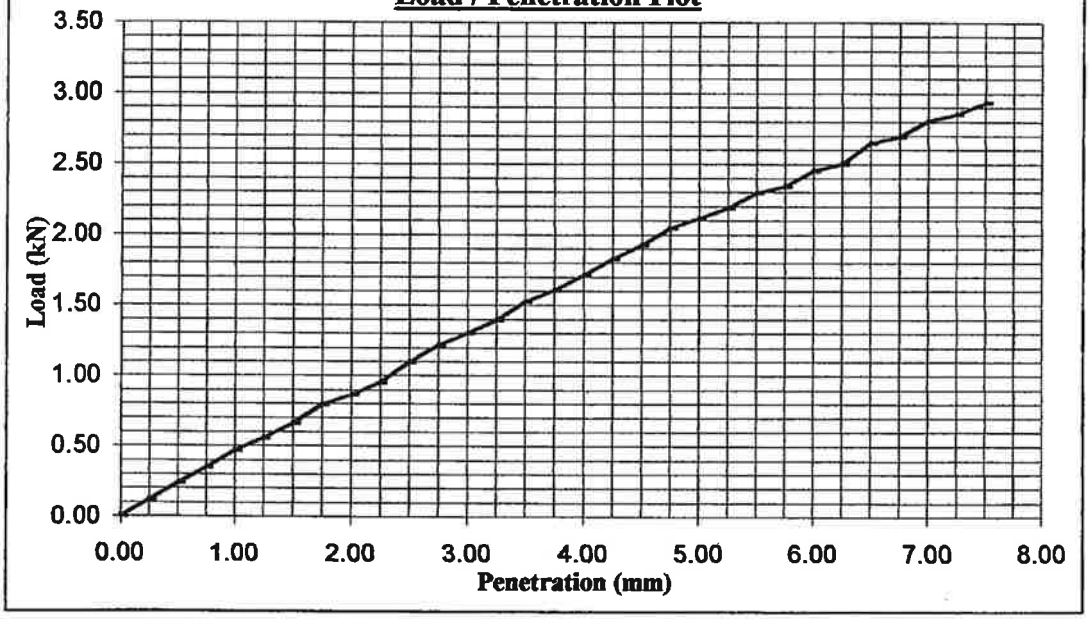
No. of Surcharge Rings : 2 Applied Surcharge (kg) : 9 Seating Load (N) : 10

Test Results

CBR Value 11.0 %

Maximum Applied Force 2.93 kN Deflection at maximum load 7.50mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm. N/A = Not Applicable N/G = Not Given.

Remarks

No Further Penetration

Distribution
Client's File
Site Office

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager

Certified that testing was to
B.S. 1377-9 : 1990 : 4.3
Date Checked & Issued : 06 - Oct - 03

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WEEKS LABORATORIES

UKAS TESTING 0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental **Report No. : H 46914**

Site : MOD, Bourne Avenue, Hayes, Middlesex

Contact : Karen Storey **Job No. : UL 20506/M1**

Sample Information

Location : 2 **Uxbridge Laboratory Reference : M 71387 / 2**
Soil Sample Description: CLAY **Client Reference : 2**
Depth of Water Table (m) : N/K Test Depth (m) : 0.5 **Rate of Loading (mm/min) : 1.0 ± 0.2**
Description of Reaction : WEEKS Vehicle **Maximum Size of Aggregate greater than 20 mm : Yes**
Environmental Conditions : Sunny **Environmental Temperature (°C) : 18**

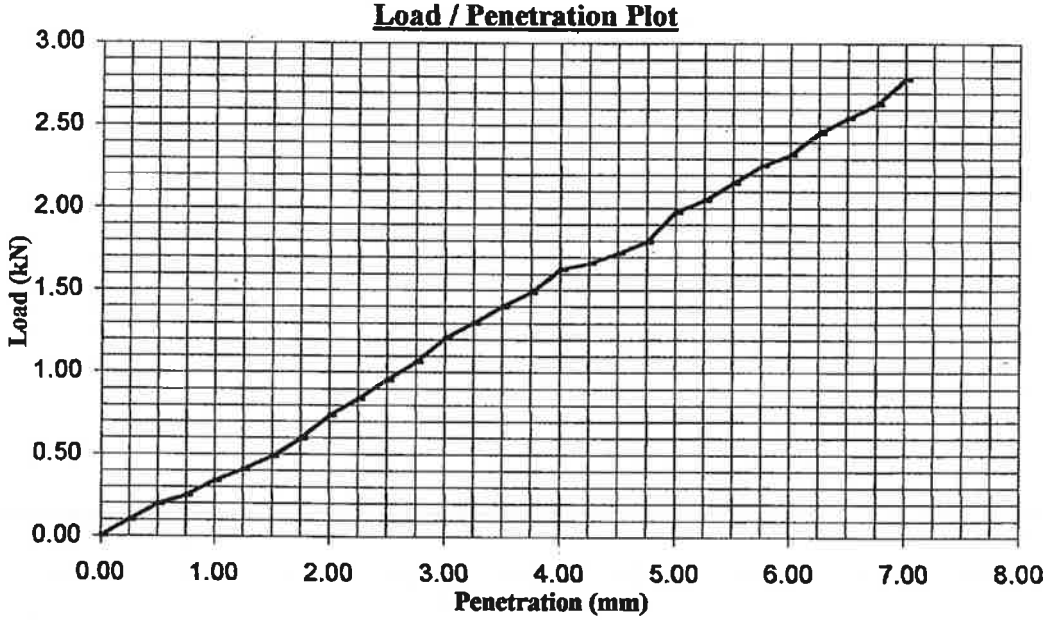
Test Data

Moisture Content (%) : 11 Test Date : 29-Sep-03
No. of Surcharge Rings : 2 Applied Surcharge (kg) : 9 Seating Load (N) : 50

Test Results

CBR Value 9.9 %
Maximum Applied Force 2.79 kN Deflection at maximum load 7.00mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm. N/A = Not Applicable N/G = Not Given.

Remarks

No Further Penetration

Distribution
Client's File
Site Office

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager

Certified that testing was to B.S. 1377-9 : 1990 : 4.3
Date Checked & Issued : 06 - Oct - 03

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WEEKS LABORATORIES

UKAS TESTING 0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental **Report No. : H 46914**

Site : MOD, Bourne Avenue, Hayes, Middlesex

Contact : Karen Storey **Job No. : UL 20506/M1**

Sample Information

Location : 3	**Uxbridge Laboratory Reference : M 71387 / 3**
Soil Sample Description: CLAY	**Client Reference : 3**
Depth of Water Table (m) : N/K Test Depth (m) : 0.5	**Rate of Loading (mm/min) : 1.0 ± 0.2**
Description of Reaction : WEEKS Vehicle	**Maximum Size of Aggregate greater than 20 mm : Yes**
Environmental Conditions : Sunny	**Environmental Temperature (°C) : 18**

Test Data

Moisture Content (%) : 12 Test Date : 29-Sep-03

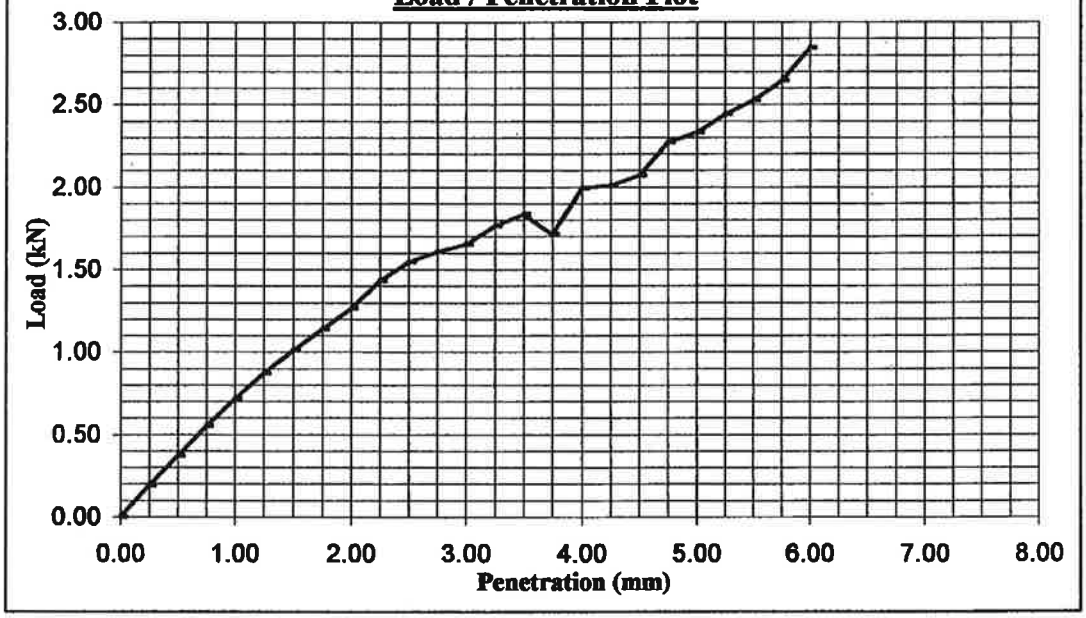
No. of Surcharge Rings : 2 Applied Surcharge (kg) : 9 Seating Load (N) : 50

Test Results

CBR Value 12.0 %

Maximum Applied Force 2.84 kN Deflection at maximum load 6.00mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm. N/A = Not Applicable N/G = Not Given.

Remarks

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager

Certified that testing was to
B.S. 1377-9 : 1990 : 4.3
Date Checked & Issued : 06 - Oct - 03

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WEEKS LABORATORIES

UKAS TESTING 0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental **Report No. : H 46914**

Site : MOD, Bourne Avenue, Hayes, Middlesex

Job No. : UL 20506/M1

Contact : Karen Storey

Sample Information

Location : 4
Soil Sample Description: Gravelly CLAY
Depth of Water Table (m) : N/K Test Depth (m) : 0.5
Description of Reaction : WEEKS Vehicle
Environmental Conditions : Sunny

Uxbridge Laboratory Reference : M 71387 / 4
Client Reference : 4
Rate of Loading (mm/min) : 1.0 ± 0.2
Maximum Size of Aggregate greater than 20 mm : Yes
Environmental Temperature (°C) : 18

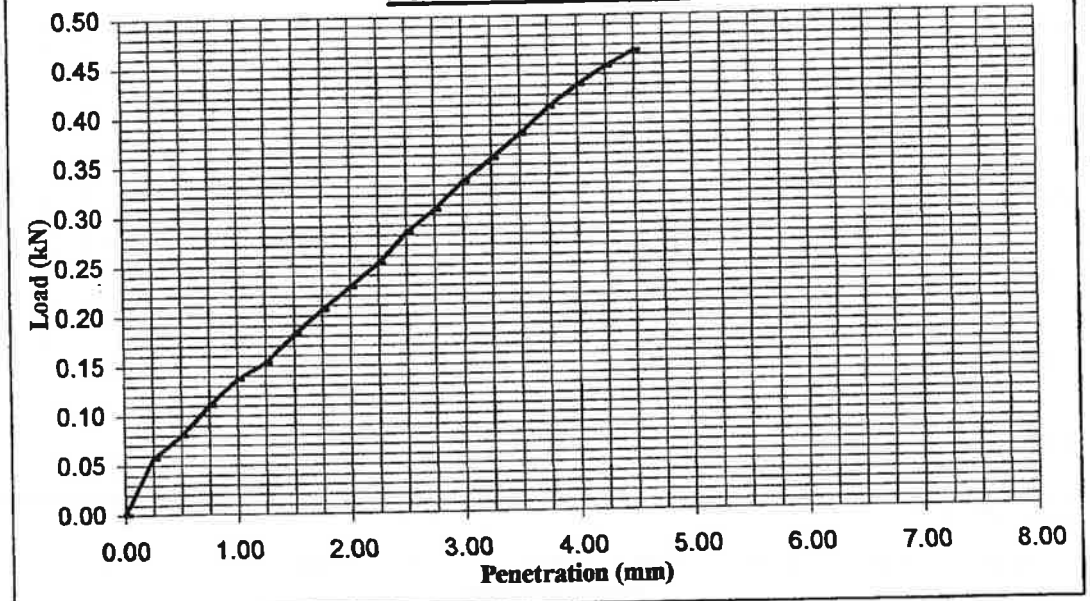
Test Data

Moisture Content (%) : 10
No. of Surcharge Rings : 2
Applied Surcharge (kg) : 9
Test Date : 29-Sep-03
Seating Load (N) : 10

Test Results

CBR Value 2.1 %
Maximum Applied Force 0.46 kN
Deflection at maximum load 4.50mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm. N/A = Not Applicable N/G = Not Given.

Remarks **Test terminated, insufficient load to cause further soil deformation**
Indicated CBR value determined at 2.50mm deflection ONLY

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager
Certified that testing was to B.S. 1377-9 : 1990 : 4.3
Date Checked & Issued : 06 - Oct - 03

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WEEKS LABORATORIES

0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental **Report No. : H 46914**

Site : MOD, Bourne Avenue, Hayes, Middlesex

Contact : Karen Storey **Job No. : UL 20506/M1**

Sample Information

Location : 5 **Uxbridge Laboratory Reference : M 71387 / 5**
Soil Sample Description: Gravelly CLAY **Client Reference : 5**
Depth of Water Table (m) : N/K Test Depth (m) : 0.5 **Rate of Loading (mm/min) : 1.0 ± 0.2**
Description of Reaction : WEEKS Vehicle **Maximum Size of Aggregate greater than 20 mm : Yes**
Environmental Conditions : Sunny **Environmental Temperature (°C) : 18**

Test Data

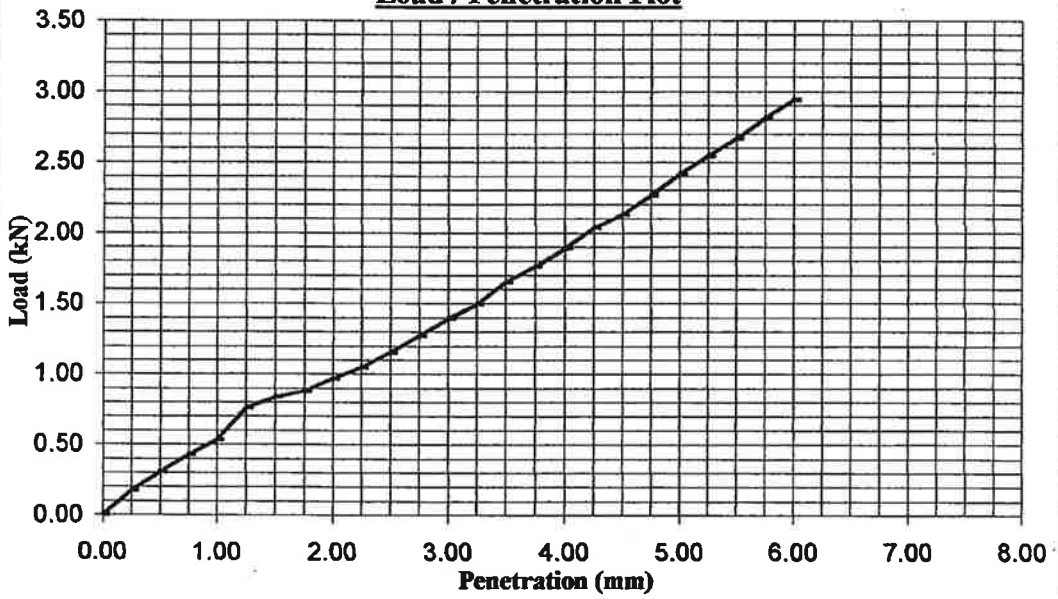
Moisture Content (%) : 4.5 Test Date : 29-Sep-03
No. of Surcharge Rings : 2 Applied Surcharge (kg) : 9 Seating Load (N) : 50

Test Results

CBR Value 12.0 %

Maximum Applied Force 2.94 kN Deflection at maximum load 6.00mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm. N/A = Not Applicable N/G = Not Given.

Remarks

No further penetration.

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager

Certified that testing was to
B.S. 1377-9 : 1990 : 4.3
Date Checked & Issued : 06 - Oct - 03

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WEEKS LABORATORIES

UKAS TESTING 0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental **Report No. : H 46914**

Site : MOD, Bourne Avenue, Hayes, Middlesex

Job No. : UL 20506/M1

Contact : Karen Storey

Sample Information

Location : 6
Soil Sample Description: Gravelly CLAY
Depth of Water Table (m) : N/K Test Depth (m) : 0.5
Description of Reaction : WEEKS Vehicle
Environmental Conditions : Sunny

Uxbridge Laboratory Reference : M 71387 / 6
Client Reference : 6
Rate of Loading (mm/min) : 1.0 ± 0.2
Maximum Size of Aggregate greater than 20 mm : Yes
Environmental Temperature (°C) : 18

Test Data

Moisture Content (%) : 5.6
No. of Surcharge Rings : 2

Applied Surcharge (kg) : 9

Test Date : 29-Sep-03
Seating Load (N) : 50

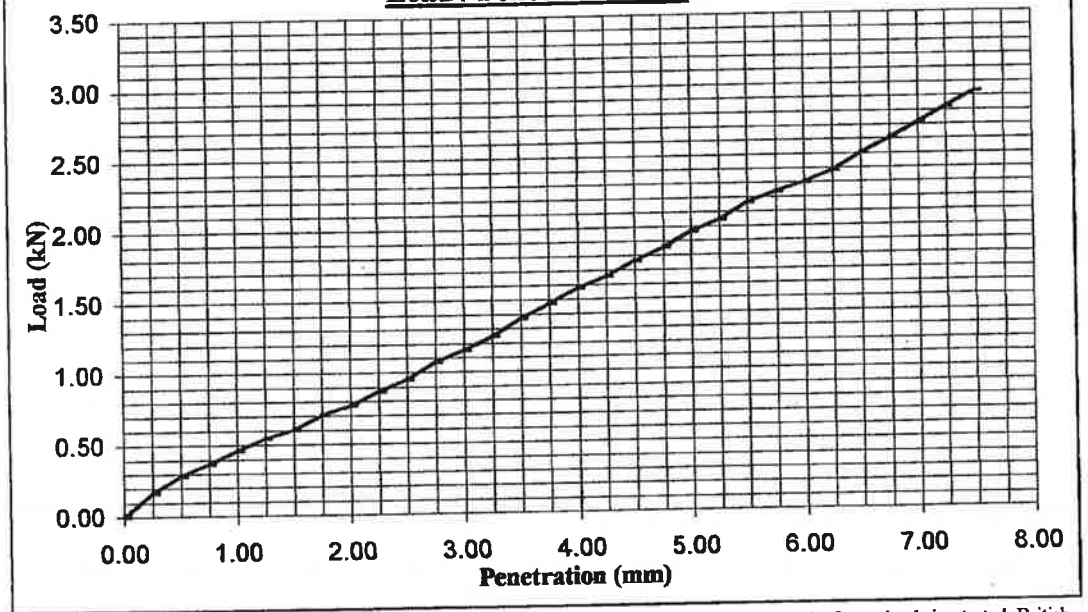
Test Results

CBR Value 9.8 %

Maximum Applied Force 2.93 kN

Deflection at maximum load 7.50mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm. N/A = Not Applicable N/G = Not Given.

Remarks

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager

Certified that testing was to B.S. 1377-9 : 1990 : 4.3
Date Checked & Issued : 06 - Oct - 03

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WEEKS LABORATORIES

UKAS TESTING 0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental
Site : MOD, Bourne Avenue, Hayes, Middlesex

Report No. : H 46914

Job No. : UL 20506/M1

Contact : Karen Storey

Sample Information

Location : 7
Soil Sample Description: CLAY
Depth of Water Table (m) : N/K Test Depth (m) : 0.5
Description of Reaction : WEEKS Vehicle
Environmental Conditions : Sunny

Uxbridge Laboratory Reference : M 71387 / 7
Client Reference : 7
Rate of Loading (mm/min) : 1.0 ± 0.2
Maximum Size of Aggregate greater than 20 mm : Yes
Environmental Temperature (°C) : 18

Test Data

Moisture Content (%) : 10
No. of Surcharge Rings : 2

Applied Surcharge (kg) : 9

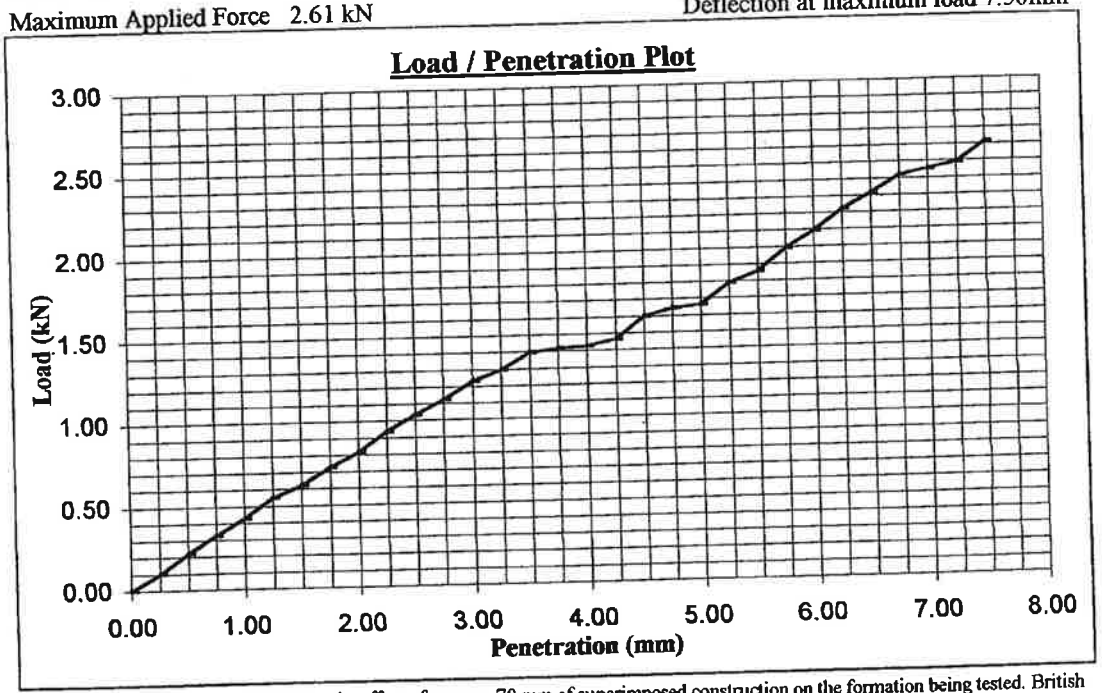
Test Date : 29-Sep-03
Seating Load (N) : 50

Test Results

CBR Value 8.3 %
Maximum Applied Force 2.61 kN

Deflection at maximum load 7.50mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm.

N/A = Not Applicable N/G = Not Given.

Remarks

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager

Certified that testing was to
B.S. 1377-9 : 1990 : 4.3
Date Checked & Issued : 06 - Oct - 03

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Client's File
Site Office

WEEKS LABORATORIES LIMITED
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WEEKS LABORATORIES

0198

TEST REPORT

California Bearing Ratio

Client : WSP Environmental **Report No. : H 46914**

Site : MOD, Bourne Avenue, Hayes, Middlesex

Contact : Karen Storey **Job No. : UL 20506/M1**

Sample Information

Location : 8 **Uxbridge Laboratory Reference : M 71387 / 8**

Soil Sample Description: CLAY **Client Reference : 8**

Depth of Water Table (m) : N/K Test Depth (m) : 0.5 **Rate of Loading (mm/min) : 1.0 ± 0.2**

Description of Reaction : WEEKS Vehicle **Maximum Size of Aggregate greater than 20 mm : Yes**

Environmental Conditions : Sunny **Environmental Temperature (°C) : 18**

Test Data

Moisture Content (%) : 15 Test Date : 29-Sep-03

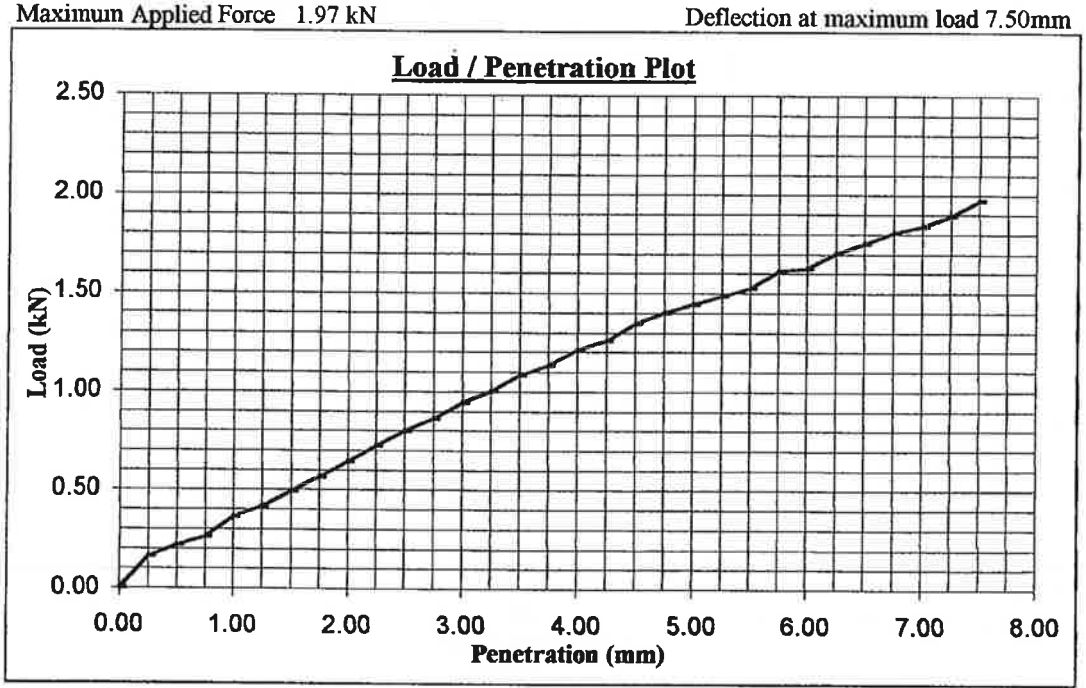
No. of Surcharge Rings : 2 Applied Surcharge (kg) : 9 Seating Load (N) : 50

Test Results

CBR Value 7.2 %

Maximum Applied Force 1.97 kN Deflection at maximum load 7.50mm

Load / Penetration Plot



Note : A surcharge of 2 kg simulates the effect of approx. 70 mm of superimposed construction on the formation being tested. British Standard states that the test is not appropriate to material with particle size>20mm. N/A = Not Applicable N/G = Not Given.

Remarks

For and on behalf of
WEEKS

Signatory Greg Wilson - Section Manager

Certified that testing was to B.S. 1377-9 : 1990 : 4.3

Date Checked & Issued : 06 - Oct - 03

Distribution
Client's File
Site Office

Notes on Limitations

Standard Terms and Conditions of Engagement

Notes on Limitations
For
Geo-Environmental and Geotechnical Consultancy Services

General

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

WSP Environmental Limited accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and

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

Phase I Environmental Audits

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP Environmental Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

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

Phase II Environmental Audits

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

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

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

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

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

Geo-environmental Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to site remediation these must be confirmed by a qualified quantity surveyor.

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

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

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

Appendix F – As Built Drainage Layout TRC

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE ADDITIONAL RISKS...

CONSTRUCTION

IT IS CONSIDERED THAT THE PROPOSED WORKS ARE WITHIN THE SCOPE OF A COMPETENT CONTRACTOR AND AS SUCH NO UNUSUAL HAZARDS HAVE BEEN IDENTIFIED, WITH THE EXCEPTION OF THE FOLLOWING:-

THE CONTRACTOR TO PROVIDE METHOD STATEMENTS TO HIGHLIGHT & MINIMISE RISKS FOR ELEMENTS OF WORK INDICATED ON THIS DRAWING MAINLY WORKING AT DEPTH & THE REQUIRED TEMPORARY SUPPORT FOR EARTHWORKS

MAINTENANCE/CLEANING/OPERATION

JETTING OF PIPEWORK/MANHOLES TO BE BY UNDERTAKEN AT REGULAR INTERVALS (APPROX 6 MONTHS) BY SPECIALIST

DECOMMISSIONING/DEMOLITION

NO SPECIAL REQUIREMENTS

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

NOTE:
ALL SOAKAWAY TANKS TO BE FOUNDED AT INVERT LEVEL 30.300

DRAINAGE NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
2. ALL DRAINAGE WORK TO BE CARRIED OUT IN ACCORDANCE WITH BS 8301, BS 8005 AND THE BUILDING REGULATIONS.
3. ALL PIPES ARE TO HAVE SURROUND IN ACCORDANCE DRAINAGE DETAILS, UNLESS NOTED OTHERWISE.
4. FOR EXACT LOCATION OF RAIN WATER AND FOUL WATER OUTLETS, REFER TO ARCHITECTS DRAWINGS.
5. SURFACE WATER DRAINS SHALL BE EITHER
H.D.P.E. RIDGIDRAIN TWINWALL CARRIER PIPE BY 'POLYPIPE PLC' (OR SIMILAR APPROVED) TO B.S EN 1401–1
OR P.C.C. PIPES TO B.S 5911 (PART 100)
OR VITRIFIED CLAY TO B.S 65
6. FOUL WATER DRAINS SHALL BE EITHER
P.V.C. PIPEWORK BY 'POLYPIPE PLC' (OR SIMILAR APPROVED) TO B.S. EN 1401–01
OR VITRIFIED CLAY TO B.S. EN 295
7. ALL GRP UNDERGROUND TANKS ARE TO BE BEDDED ON AND ENCASED IN 250mm GEN 3 20mm AGG. CONCRETE STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
8. ROAD GULLY OUTLET & KERBDRAIN PIPE INVERT LEVELS TO BE 600mm BELOW TOP OF GRATING LEVEL.
9. ALL MANHOLE AND INSPECTION CHAMBER COVERS, FRAMES AND SLOT TYPE DRAINS IN TRAFFICKED AREAS SHALL COMPLY TO EITHER B.S. 497 : PART 1 HEAVY DUTY COVERS TO MA60. OR B.S. EN 124 GRADE D400 (11.5 TONNE WHEEL LOADING)
SYPHONIC DRAINAGE TO HAVE VENTED COVERS
10. FOR DRAINAGE CONSTRUCTION AND PIPE BED DETAILS REFER TO DRAWING No.
11. ALL DRAINAGE BRANCHES TO BE 100mm FOR FOUL WATER & 150mm FOR SURFACE WATER UNLESS MARKED OTHERWISE.
12. ALL SOIL & VENT STACKS TO HAVE RODDABLE ACCESS 150mm ABOVE GROUND FLOOR SLAB LEVEL WITH REMOVABLE ACCESS PLATES.
13. ALL DRAINAGE CHANNELS TO HAVE ACCESS CHAMBER AT ENDS OF RUNS & EVERY 30m THEREAFTER.
14. ALL KERB DRAINAGE TO HAVE SUMP UNITS AT OUTLETS OF RUNS & HAVE RODDING ACCESS POINTS EVERY 30m THEREAFTER.
15. ALL SHALLOW DRAINAGE (<900mm COVER) AND DRAINAGE BELOW SLAB TO BE ENCASED IN MIN 150mm CONCRETE SURROUND.
16. ALL CONCRETE SURROUNDS FOR THE DRAINAGE TO BE CLASS DC4Z (SULPHATE RESISTING)

LEGEND.

- 1200mmØ MANHOLE & DRAIN RUN — FOUL WATER – RED, CLEAN SURFACE WATER – BLUE, DIRTY SURFACE WATER – GREEN
- 1500mmØ MANHOLE & DRAIN RUN — CLEAN SURFACE WATER – BLUE, DIRTY SURFACE WATER – GREEN
- 1800mmØ MANHOLE & DRAIN RUN — CLEAN SURFACE WATER – BLUE, DIRTY SURFACE WATER – GREEN
- EXISTING FOUL WATER DRAINAGE RUN & MANHOLE
- EXISTING CLEAN SURFACE WATER DRAINAGE RUN & MANHOLE
- HIGH LEVEL SYPHONIC DRAINAGE PRIMARY/SECONDARY SYSTEM
- PACKAGED PUMP STATION WITH RISING MAIN
- GATIC SLOTDRAIN D400 OR SIMILAR (200mm C40 CONCRETE SURROUND)
- ACCESS CHAMBER/OUTLET
- BEANY TYPE KERB DRAIN (150mm C20 BED & HAUNCH)
- RODDABLE TRAPPED FLOOR GULLY (RTG)
- SOIL & VENT PIPE (SVP)
- SOIL STUB STACK INCL AAV (SS)
- PRESSURISED SYPHONIC DOWNPIPE (SYP)
- GRAVITY RAINWATER DOWNPIPE (RWP)
- CONDER CLASS 1 BY-PASS PETROL INTERCEPTOR
- +32.000 PROPOSED NEW SURFACE LEVELS
- +31.300 EXISTING SURFACE LEVELS

PROLOGIS

AS BUILT

REV	DATE	DESCRIPTION	CHK	DRN
AB	08.12.14	AS BUILT ISSUE.	TC	JC
J	13.10.14	REVISED TO SUIT LATEST ARCHITECTS SITE PLAN.	TC	DOB
H	08.09.14	SPRINKLER TANKS DELETED	TC	KD
G	01.08.14	R.W.H.T DETAIL UPDATED. COVER LEVELS TO INTERCEPTORS & PUMP STATIONS AMENDED.	TC	DOB
F	28.07.14	MANHOLES SW6 + PSW10 REV'D	TC	DOB
E	18.07.14	ATTENUATION TANKS 3 + 6 MOVED WITH MH's TO SUIT. MANHOLES MOVED TO SUIT TREE LOCATIONS.	TC	DOB
D	02.07.14	MANHOLE REFERENCES ADDED.	TC	DOB
C	09.06.14	UPDATED LAYOUT/SOAKAWAYS	TC	CE
B	06.06.14	ISSUED FOR CONSTRUCTION	TC	CE
A	13.05.14	DRAINAGE AMENDED TO SUIT SPRINKLER TANKS AND VEHICLE WASH AREAS.	TC	DOB
T3	10.12.13	UNIT C REVISED	TC	DOB
T2	31.10.13	ISSUED FOR TENDER	TC	DOB
T1	28.10.13	FOUL DRAINAGE AMENDED TO SUIT OFFICE LAYOUT.	TC	MD
P2	02.09.13	PRELIMINARY ISSUE	TC	CE
P1	18.12.12			

NOTE: Where a "P" revision applies, this drawing is NOT to be used for construction

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PROJECT
PHASE 3
PROLOGIS PARK, HAYES

TITLE
DRAINAGE LAYOUT
UNITS 5, 6A & 6B

ARCHITECT
MICHAEL SPARKS Associates

DRAWN	DESIGNED	CHECKED
CE	TC	TC

DATE	SCALE	STATUS
Mar 2010	1:300	AS BUILT

TRC - 2607 - 51 AB

CIVQS — ISO 9001 REGISTERED FIRM — Certificate No. GB08/08800
IAB — INTERNATIONAL ACCREDITATION BOARD — Registration No. 0066/1

SURFACE WATER DESIGN CRITERIA

On - Site Soakaways
designed for 1:100 year returns storm
+ 20% climate change
using an Infiltration Rate of 4.2×10^{-6}

NOTE:
ALL SOAKAWAY TANKS TO BE FOUNDED AT INVERT LEVEL 30.300

DRAIANAGE LAYOUT

Scale 1:300

1:300 0 3m 6m 9m 12m 15m 18m 21m 24m 27m 30m
1:1 0 10mm 20mm 30mm 40mm 50mm 60mm 70mm 80mm 90mm 100mm

AO SHEET

Appendix G – Site Plans

See Drawing Numbers:

294760-EP-DR001 – Site Boundary

294760-EP-DR002a – Site Layout and Air Emission Points

294760-EP-DR002b – Site Layout and Water Emission Points

294760-EP-DR003 – Environmental Site Setting