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Report No H8076

HIRWAUN INDUSTRIAL ESTATE DEVELOPMENT

INTERPRETATIVE REPORT ON SITE INVESTIGATION

Carried out for: Enviroparks Ltd

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Date: January 2009

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1 INTRODUCTION

During August 2008 Soil Mechanics (SM) were commissioned by Pell Frischmann (PF), on behalf of Enviroparks Ltd (EL), to carry out a site investigation at Hirwaun Industrial Estate Development, Hirwaun. The investigation was required to obtain geotechnical and geoenvironmental information for a proposed Enviroparks waste recycling plant including anaerobic digestion and plasma conversion systems.

The scope of the investigation, which was specified by PF, comprised cable percussion and rotary drilled boreholes, trial pits, in situ testing and laboratory testing. The investigation was carried out in accordance with the contract specification and relevant standards (see References). The fieldwork was carried out between 14th August and 23rd September 2008.

This report presents the factual records of the fieldwork and laboratory testing together with an interpretation of the findings with respect to the proposed development. The data is also presented separately in digital format following AGS (2005).

A previous desk study report had been carried out by EL (dated November 2007). A copy of their report was made available to SM by PF at the outset of the current investigation. Previous investigations had been carried out by Wallace Evans, 1972 and Exploration Associates, 1995.

2 THE SITE AND GEOLOGY

2.1 The Site

Hirwaun Industrial Estate Development is situated approximately 1.5km northwest of Hirwaun Town Centre, see Site Location Plan in Enclosure F. The site is at National Grid reference SN 938 068.

The site comprised an area of approximately level ground that has been prepared as a development platform by regrading the site some 10 years ago. The site is approximately rectangular in shape and covers an area of approximately 8 Hectares and is approximately 250m to 300m at its widest. The site was locally flooded across the southern section of the site. No buildings were present on the site.

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Evidence of existing drainage was visible with both herring bone type drainage and open ditches observed across the site.

The site boundary is defined by; a track at the lower edge of the Penderyn Reservoir embankment in the north, Ninth Avenue in the east, Fifth Avenue in the south and an unnamed stream in the west. The entrance to the site was established from the south boundary from Fifth Avenue.

The area surrounding the site is used for the Penderyn Reservoir and farm fields to the north, farm fields and woodland to the west and by industrial units in the south and east.

2.2 **EL Desk Study**

The desk study carried out by EL revealed that the site was formally used as an Ordnance factory during the Second World War although all buildings associated with the plant were demolished in the late 1960s early 1970s. The site remained vacant until the late 1990s when the Welsh Development Agency (WDA) re-profiled the site creating the plateau noted in the previous section.

The site was not thought to be particularly contaminated from the previous use as it is believed that natural materials were used to level the site.

2.3 **Published Geology**

The published geological map covering the site, GS Sheet 231 (1979) drift shows the surface of the site to be covered by alluvium over the south and glacial till to the north. The glacial till probably underlies the alluvium. Bedrock at the site comprises the Lower Coal Measures, a sequence of mainly mudstones and sandstones with rare coal seams. An unnamed coal seam is shown to outcrop with an east to west strike through the centre of the site. It is not part of the scope of this report to comment on any possible mining beneath the site.

The 1995 desk study includes a 1993 mining report which states that it is extremely unlikely that mining has been undertaken under the site in the past, or will be in the future. However, within this mining report it states that it is valid for a period of 12 months only, and therefore should be updated.

Two north south trending faults are located to the east and west of the site with downthrows to the west. The general dip of strata is to the south.

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From the desk study previous investigations revealed alluvial deposits overlying glacial deposits with Lower Coal Measures bedrock found at approximately 10 m below ground level. The Alluvium was believed to have a layer of peat within it.

3 FIELDWORK

3.1 General

The fieldwork was carried out in general accordance with BS EN 1997-2 (2007) and its related standards together with the relevant section of BS 5930 (1999).

The exploratory hole locations were selected by PF. The locations were set out from local features. The co-ordinates and reduced levels were surveyed by Pelorus who surveyed final position to National Grid and Ordnance Datum. The exploratory hole locations are shown on the Site Plan in Enclosure F.

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

SUMMARY OF EXPLORATORY HOLES

| ТҮРЕ | QUANTITY | MAXIMUM DEPTH (m) | REMARKS |
|--------------------------------|----------|----------------------|----------------------------------------------|
| Cable Percussion Boring | 9 | 10.90 | Designated as BH101 to BH109 |
| Rotary Core Drilling/Open Hole | 5 | 18.00 | Designated as BH101R, 103R, 105R, 107R and |
| Drilling | · · | 10.00 | 108R |
| Trial Pits | 19 | 3.80 | Machine dug, designated as TP1, TP1A, TP2 to |
| That I lo | | 0.00 | TP11, TP11A, TP12, TP12A, TP14 to TP17 |

The exploratory hole records are presented in Enclosure A and should be read in conjunction with the Key included therein. The records provide descriptions of the materials encountered, in accordance with the standards referenced on the Key, details of the samples taken, together with observations made during boring, drilling and pitting. Photographs of the trial pits and recovered cores are presented in Enclosure E.



On completion of the fieldwork all geotechnical samples were transported to the laboratory of Soil Mechanics for temporary retention and testing. Geoenvironmental samples were transported from site directly to the laboratory of TES Bretby for testing.

Plots of SPT 'N' value against depth and reduced level are presented in Enclosure F.

3.3 **Instrumentation and Monitoring**

The instruments installed in the exploratory holes are shown on the logs and detailed in Enclosure B. Records of groundwater and gas monitoring carried out by SM who monitored the installations after the fieldwork period are presented in Enclosure B.

4 LABORATORY TESTING

4.1 **Geotechnical Testing**

The testing was scheduled by SM and was carried out in accordance with BS 1377 (1990). The testing is summarised below and the results are presented in Enclosure D.

SUMMARY OF GEOTECHNICAL LABORATORY TESTING

| TYPE | REMARKS |
|-------------------------------------------------------|---------------------------------------------------------------------------|
| Moisture Content Determination | 16 no |
| Atterberg Limit Determination | 11 no |
| Particle Size Distribution Analysis | 14 no tests |
| pH and Water Soluble Sulphate Content of Soils | Testing appropriate for use with BRE Special Digest 1 (2005). 21 no tests |
| Unconsolidated Undrained Triaxial Compression Testing | 1 no test |
| One Dimensional Oedometer Consolidation Testing | 2 no tests |
| Compaction tests | 2 no tests 2.5kg method and 2 no tests 4.5kg method |

A plot of index properties against depth and a plasticity chart are presented in Enclosure F.

4.2 **Geoenvironmental Testing**

The testing was scheduled by SM and was carried out by TES Bretby at their Burton on Trent laboratory. The results are presented in Enclosure D.

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Testing as required under the Landfill (England and Wales) Regulations 2002 (as amended) and current regulatory guidance (EA 2005) has not been instructed.

5 GROUND CONDITIONS AND GROUNDWATER

5.1 Strata Encountered

Descriptions of the strata encountered are given on the exploratory hole records. The downward succession encountered is broadly uniform across the site and is summarised below. Depths and reduced levels of the base of the Made Ground and depths and reduced levels of rockhead are presented on plans in Enclosure F.

TABLE: SUMMARY OF STRATA - ALL EXPLORATORY HOLES

| Code | STRATA | Minimum thickness (m) | Maximum thickness (m) | Minimum level top of strata (m OD) | Maximum level top of strata (m OD) | Remarks |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|---------------------------------------------|---------------------------------------------|-----------------------------------------------------------|
| Α | MADE GROUND | 0.10 | 3.60 | 198.88 | 203.44 | Base of layer 0.10 to 3.60 (m) |
| A1 | MADE GROUND: Very dense brown clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with low cobble content. Cobbles are angular to subangular of sandstone, locally of brick, concrete, fused slag, builder's waste etc. Locally a sand | 0.10 | 3.50 | | | Not BH 108 & 108A or TP12, 12A & 14 |
| A2 | MADE GROUND: Soft to stiff grey and black slightly sandy slightly gravelly silty CLAY or SILT with low to medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite locally of brick, concrete, builders waste etc | 0.10 | 3.20 | | | TP01A, 2 to 6, 8, 9, 11, 12A 14 and 15 only. |
| В | ALLUVIUM (Old Topsoil Layer ?) | | | | | |
| B1 | Soft to firm brown and black clayey SILT with rare small pockets of back woody peat and many roots/rootlets | 0.50 | 0.50 | | | Trial Pit 6 only |
| С | GLACIAL DEPOSITS | 3.52 | 8.50 | 195.67 | 200.68 | Base of layer 0.50 to 11.70 (m) |
| C1 | Dense to very dense locally medium dense brown and grey brown clayey silty subrounded to angular fine to coarse GRAVEL of sandstone with low to high cobble content. Locally gravelly COBBLES | 8.50 | 0.20 | | | All holes that proved the base of the Made Ground |
| C2 | Firm to stiff grey slightly sandy slightly sandy silty CLAY with medium cobble content. Gravel is subrounded to subangular fine to coarse of sandstone and quartzite. Locally organic ? and soft and a silt. | 0.30 | 3.40 | | | BHs 102, 103 & 104 and TP01, 6, 7, 12A, 14, 15 & 16 only. |
| D | WEATHERED BEDROCK | 0.10 | 3.60 | 187.54 | 194.07 | Rockhead 8.50 to 12.00 (m) |
| D1 | Fractured broken SANDSTONE with brown sandy silt (Driller's description) | 0.20 | 5.40 | | | BHs 101R, 103R, 105R, 107R and 108R only |
| E | LOWER COAL MEASURES | 0.10 | 3.60 | 186.88 | 191.42 | Rockhead 8.50 to 12.00 (m) |
| | | | | | | , |



TABLE: SUMMARY OF STRATA - ALL EXPLORATORY HOLES

| E1 | Moderately strong to very strong grey stained brown SANDSTONE/SILTSTONE rare mudstone bands | 0.60 | 6.30 | | BHs 101R, 103R, 105R, 107R and 108R only |
|----|---------------------------------------------------------------------------------------------|------|------|--|---------------------------------------------|

The strata profile encountered across the site was relatively consistent with a layer of Made Ground typically up to 3.5 m thick overlying cohesive and/but predominantly granular glacial deposits. It is possible that adjacent to the southern border by the stream alluvium may be encountered although there was little evidence of this from the exploratory holes. Bedrock was encountered at a depth of between 8.5 to 12.0 m (186.9 to 191.4 mAOD).

5.2 **Made Ground**

Made Ground, 0.1 to 3.6 m thick but typically over 2.0 m thick, was encountered across the whole site. The material was proved down to a reduced level of 195.7m OD. A plan showing the thicknesses of the Made Ground and also the basal levels of the material are shown on a plan in Enclosure G.

The Made Ground was predominately granular but cohesive layers or pockets up to 3.2 m thick were found but typically less than 1.0 m thick.

The cohesive layers were predominantly of a soft to firm consistency. These soils should therefore be regarded as being of relatively low strength and possibly relatively compressible.

For the granular soils SPT N Values ranged from 14 to over 50 suggesting a medium dense to very dense relative density. It is possible however that the higher values are as a consequence of encountering coarse granular particles and therefore for design purposes the strata should be regarded as having a medium dense relative density. An internal angle of friction of approximately 32 to 34 degrees (Peck & Thornburn (1975)) would therefore be assessed. A bulk density for this stratum would be about 1.9 Mg/m³.

5.3 **Alluvium**

Alluvium comprising soft to firm clayey silt with rare small pockets of back woody peat and many roots/rootlets was proved in Trial Pit 6 only. From previous investigations the extent of the alluvium (peat) would be greater than would be expected from this investigation. It is possible

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however that the material was removed during the regrading exercise. The supposed extent of the alluvium (peat) is shown on the Exploratory Hole Location Plan in Enclosure F.

5.4 Glacial Deposits

5.4.1 General

Underlying the Made Ground both cohesive but predominantly granular glacial deposits were encountered and proved to a depth of 8.50 to 12.00 m (186.9 to 191.4 mAOD) where bedrock was encountered.

In assessing parameters in glacial deposits it is usual to use SPT 'N' values, assuming it has not been possible to recover undisturbed samples of sufficient quality for laboratory testing. However such soils often contain coarse granular materials where high SPT 'N' values are often recorded which are not necessarily representative of the true strength or in situ relative density of the soil. This is usually as a consequence of trying to drive a cobble or boulder in the ground requiring very high blow counts, to achieve any sort of penetration. It has been found therefore that when determining parameters from 'N' values for design purposes the lower bound or even the lowest values obtained are more representative of the true relative density than the mean values and on this basis suggested design lines are presented on the SPT 'N' value with depth/reduced level plots in Enclosure F. In this context the 'N' values assessed for design purposes would be about 5 at say 2 m at the top of the strata increasing incrementally to over 40 blows or locally greater at say 10 m depth.

5.4.2 Cohesive Glacial Deposits

Cohesive glacial deposits (Glacial Till) were found across the site in about half the exploratory holes with thicknesses ranging from 1.3 to 3.5 m but with typical thicknesses of 1.6 m.

The soils were essentially clays of low plasticity. Given the SPT N-values assessed for design purposes (see Section 5.4.1) then the clay bands had a consistency of soft to firm becoming stiff then very stiff with increasing depths. Based on published correlations (Stroud & Butler (1975)), the N-values suggest an undrained shear strength (c_u) of clay layers at depths of 2.0 m of approximately 30 kPa increasing incrementally to over 150 to 200 kPa at about 10 m and deeper.

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Given the low plasticity of the soils, then a coefficient of volume compressibility (m_v) of approximately 0.4 m²/MN (Stroud & Butler (1975)) at 2.0 m decreasing incrementally to about 0.05 m²/MN at 10.00 m would be estimated. A bulk density for this stratum would be about 2.1 Mg/m³.

5.4.3 **Granular Glacial Deposits**

The glacial granular deposits represent the predominant glacial deposit and was found across the site in the majority of the exploratory holes that proved the base of the Made Ground. In general an initial layer of this granular deposit was encountered above the cohesive glacial deposit (Glacial Till), which in turn overlay another thicker deposit of granular glacial material. SPT N-values for design purposes within this strata would be typically 5 at 2.0 m rising incrementally to 40 at 10.0 m suggesting a loose becoming medium dense then dense relative density. An internal angle of friction of approximately 28 to 30 degrees (Peck & Thornburn (1975)) at 2.0 m increasing incrementally to about 38 to 40 degrees at 10.0 m and deeper would therefore be assessed.

A bulk density for this stratum would be about 2.0 Mg/m³.

5.5 **Lower Coal Measures**

Predominantly sandstone bedrock was encountered at a depth of between 8.5 to 12.0 m (186.9 to 191.4 mAOD) where proved by rotary coring. It is possible locally on the site rockhead may be found both deeper and shallower than those depths. A plot of depths to bedrock and reduced levels of rockhead are presented on a plan in Enclosure F.

The rock comprised a moderately strong to very strong sandstone/siltstone with rare mudstone bands but upper layers, up to 5.2 m thick, were recorded which were either highly weathered or fractured as no or little core could be recovered.

5.6 Groundwater

A summary of groundwater strikes encountered during boring, drilling and pitting are presented below and also a table of water levels recorded in the boreholes at the start of the shift.

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TABLE: SUMMARY OF GROUNDWATER STRIKES

| Hole | Depth of Water Strike (m) | Water depth after 20 mins (m) | Remarks/Observations |
|--------|---------------------------------|----------------------------------------|----------------------------|
| BH101R | 6.00 | 5.90 | slow |
| BH101R | 10.00 | 7.30 | fast |
| BH103 | 8.40 | 1.50 | |
| BH103R | 1.50 | 1.20 | Medium |
| BH104 | 9.10 | | |
| BH105R | 3.00 | 2.70 | Medium |
| BH105R | 8.10 | 0.80 | Fast |
| BH107R | 0.90 | 0.80 | Fast |
| BH108R | 0.90 | 0.80 | Fast |
| TP2 | 2.40 | 2.40 | Seepage |
| TP3 | 0.00 | NA | Seepage from surface |
| TP5 | 0.00 | NA | Seepage from surface |
| TP7 | 0.00 | NA | Seepage from surface |
| TP8 | 0.00 | NA | Strong inflow from surface |
| TP11 | 1.40 | NA | Seepage |
| TP11A | 1.40 | NA | Strong inflow |
| TP12 | 1.70 | NA | Seepage |
| TP12A | 1.80 | NA | Seepage |
| TP14 | 1.80 | NA | Strong inflow |
| TP15 | 1.80 | NA | Seepage |
| TP16 | 0.30 | NA | Strong inflow |
| TP17 | 1.30 | NA | Strong inflow |

TABLE: START OF SHIFT WATER LEVELS

| Hole | Depth (m) | Casing Depth (m) | Water Depth (m) | Remarks |
|--------|-----------|---------------------|--------------------|----------------|
| BH101 | 4.50 | 3.50 | 1.60 | Start of shift |
| BH101R | 16.50 | 12.00 | 0.95 | Start of shift |
| BH102 | 4.50 | 4.50 | 3.40 | Start of shift |
| BH107R | 11.00 | 8.50 | 0.80 | Start of shift |
| BH108R | 6.00 | 6.00 | 0.80 | Start of shift |

These observations however do not necessarily indicate the position of the water table as equilibrium conditions were not determined. It is possible therefore that a higher water table than suggested by the boreholes may be found during construction.



Groundwater depths recorded in standpipes after completion of fieldwork ranged from 0.10 m (Borehole 109) to 2.04 to 2.31 m (Boreholes 101 to 103 & 105) that is with water-table reduced levels varying from 196.8 to 199.8 mAOD. A plan showing the levels and depths to the groundwater is presented in Enclosure F. From this plan it appears the hydraulic gradient falls to the south.

It should be appreciated that part of the site was flooded suggesting, given the predominantly granular strata, a water table close to ground level at least locally. It will be appreciated that seasonal fluctuations in groundwater level will occur with the highest levels likely to be recorded towards the end of the winter and following extended periods of heavy rain. Other effects such as investigation and constructional excavation may also change groundwater levels.

6 PROPOSED WORKS

It is proposed to construct a waste recycling plant including anaerobic digestion and plasma conversion systems, a power station office block/visitors centre and other structures. Details of the plant were provide as a series of drawings referenced M53274, dated August 2008. The proposed loadings are presented below:

TABLE: PROPOSED STRUCTURAL LOADINGS

| Fuel Prepara | Fuel Preparation Area | | bic Area | | asification ss Area | Pryolsis F Are | | Biomax Process Area | | | | Power House | | Water Treatment Area | | Visitor's centre |
|---------------------------------|---------------------------------------------------|------------------------|--------------------------|-----------------|-------------------------|-------------------|-------------------------------|------------------------|-------------------------------|--------------|-------------------------------|-------------|---------|--------------------------------------------------------|--|------------------|
| Structure | Load | Structure | Load | Structure | Load | Structure | Load | Structure | Load | Structure | Load | Structure | Load | | | |
| Dano drums | 100 tonne rotating load | Inoculation Chamber | 65 kN/m ² | Floor | 65 kN/m² | Floor | 65 kN/m² | Centrifuge | 65 kN/m² | Engines | 6x60 tonne piles | Reactor | 75kN/m² | Two storey building with strip footings | | |
| Piles under dano drums | 4 piles at 60tonne s each at each end | Day tanks | 65 kN/m² | Portal Frame | 30 tonnes per column | Portal Frame | 30 tonnes per column | Macerators | 65 kN/m² | Turbines | 6x60 tonne piles | | | | | |
| Waste storage area | 50 kN/m² | Anaerobic Digesters | 165 kN/m ² | | | | | Separators | 65 kN/m² | Portal frame | 50 tonnes per column | | | | | |
| Macerators | 50 kN/m² | Driers | 65 kN/m² | | | | | Portal frame | 30 tonnes per column | | | | | | | |
| Skip | 50 kN/m ² | Ammonia Scrubber | 65 kN/m ² | | | | | | | | | | | | | |
| Portal frame | 60 tonnes per column | LPG | 65 kN/m² | | | | | | | | | | | | | |

It is understood that many of the structures will be founded below or partly below ground level with founding levels down to 195.5 mAOD. These structures will therefore have full or partial basements.

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7 GEOTECHNICAL ENGINEERING ASSESSMENT

7.1 Foundations

7.1.1 Introduction

The strata profile encountered across the site was relatively consistent with a layer of Made Ground typically 2.0 m thick (but locally up to 3.5 m thick) overlying cohesive and/but predominantly granular glacial deposits. There is evidence from previous investigations at the site (undertaken in 1995) to suggest that adjacent to the southern border by the stream alluvium may be encountered, however there was little conclusive evidence of this from the recently drilled exploratory holes. Bedrock was encountered at a depth of between 8.5 to 12.0 m (186.9 to 191.4 mAOD). Groundwater was found at virtually ground level to about 2.27 m (196.8 to 199.8 mAOD).

While the strata overall in terms of layer thicknesses is relatively consistent within each layer there is significant variation of the material. In this context bands of clay of apparently variable thickness are present in both the Made Ground and underlying Glacial Deposits although the soils overall are predominantly granular. Consequently it is very difficult to give definitive guidelines for foundations for a structure as a particular footing could be on a part of the site where clay predominates while its neighbouring footing is on predominantly granular soils. In this case the conditions exist for differential movement as each stratum has differing settlement/stiffness properties. It may be therefore advisable to consider piling all structures that are sensitive to ground movements. Such structures could include portal frame column bases, machinery foundations etc.

For light to moderate loads where some settlement may be acceptable shallow strip or pad foundation could be feasible but such decisions can only be made at the design stage when more details of the structures are available.

The following therefore presents options for the various foundation types with sufficient information to enable foundations to be designed. Given the complexity of the development and of the ground conditions it is likely that it will be necessary to do a foundation assessment on a structure by structure basis when full details are available.

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7.1.2 Shallow foundations

It is anticipated that only a few of the structures would be founded on shallow foundations close to ground level. This would notably be the office/visitors centre in the south east corner of the site. However almost all such foundations would mean founding within the Made Ground. Consequently only the lightest structures should have such foundations. It is however possible that at the basement level shallow foundations could be used for the more lightly loaded structures where the foundations would be most likely on the glacial deposits.

The Made Ground based on the testing carried out has reasonable properties being predominantly granular. It is possible therefore that this material was laid in a controlled manner following an earthworks type specification. There is always however a risk be it slight in founding in such soils. Consequently strip footing should be suitably reinforced so they can span any weak ground or alternatively utilise a piled foundation.

For strip foundations to carry wall loads then foundations should be taken below any unsuitable materials to a minimum depth of say 0.75 m (assuming granular strata) where Made Ground (close to ground level) or natural glacial soils (at basement level) will be found. The natural glacial soils, immediately below the Made Ground based on SPTs have generally poorer properties than the Made Ground. In this context the Made Ground would be medium dense while the natural soils would only be loose (see plots of SPT 'N' value against depth).

Below are presented tables which give safe bearing pressures to enable sizing of pad foundations and/or strip footing widths to be derived once loads are known for both the Made Ground and the Glacial Deposits. These values have been derived assuming total settlement for a particular footing does not exceed 25 mm, which is the conventional maximum limiting criteria, for assessing allowable bearing pressures, for most structures.

SAFE BEARING PRESSURES TO LIMIT SETTLEMENT TO 25mm FOR SPREAD OR STRIP FOUNDATIONS FOUNDED WITHIN THE MADE GROUND

| Minimum Founding | Relative | Safe bearing capacity (kPa) for foundations not exceeding the following widths | | | | |
|----------------------------------------|-----------------|--------------------------------------------------------------------------------|------------------------|------------------------|--|--|
| depth (m) below existing ground level. | density | Foundation width 1.00m | Foundation width 2.00m | Foundation width 4.00m | | |
| 0.75 m | Medium Dense | 150 | 100 | Not anticipated | | |

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SAFE BEARING PRESSURES TO LIMIT SETTLEMENT TO 25mm FOR SPREAD OR STRIP FOUNDATIONS FOUNDED WITHIN THE GLACIAL DEPOSITS

| Minimum Founding | Relative | Safe bearing capacity (kPa) for foundations not exceeding the following widths | | | | | |
|------------------------------------------------------------|----------|--------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|--|--|--|
| depth (m) below density existing ground level. | | Foundation width 1.00m Foundation width 2.00m | | Foundation width 4.00m | | | |
| Below the Made Ground and 0.75m into the material | loose | 100 or 50 if close to the water table | 75 or 40 if close to the water table | 75 or 40 if close to the water table | | | |

Notes: Bearing pressures would have to be halved as indicated if at or close to the water table which is what would be expected.

Prior to construction of such foundations, the formation zone should be inspected by a suitably experienced person to confirm the founding conditions. It should be appreciated that soils can be variable and locally softened, and therefore the minimum relative density given above are for guidance to enable an inspector to satisfy himself that at the founding level the strata is suitable.

All soft or loose soils encountered at the formation level should be removed and replaced with compacted engineering fill or lean mix concrete. Upon excavation and following inspection, the formation zone should be immediately concreted or protected by a layer of blinding to prevent softening, especially in the presence of groundwater, of the exposed soils. In this context the soils being sandy are particularly prone to these effects. Comments regarding the groundwater are presented in Section 5.6.

7.1.3 Piles

It is anticipated that the majority of the structures will be piled.

It should be appreciated that the load bearing characteristics of piles are very dependent on the type of pile, method of installation and construction, and workmanship and as such it is recommended that detailed discussions be held with suitably experienced piling contractors prior to finalising design. In any event positive assurances should be sought from the piling contractor in respect of performance of their proprietary system.

For the design of piles, both a driven or bored concrete cast in situ pile could be considered. From the boreholes pile lengths of say 10 to 15 m would be anticipated with piles founded in bedrock. A driven pile may not be acceptable given the environmental hazards (noise and vibration) that results from such methods. In addition such piles may prove difficult to pile to depth due to the coarse nature of the ground.



It is assumed that piles will terminate within bedrock. In this case the maximum working load would be defined by the working compressive strength of the concrete (normally taken as 25%) used to form the pile shaft and for a 450 mm diameter bored pile would equate to a vertical working load of about 1000 to 1200 kN. It is probably advisable however to use lower pile loads for preliminary design purposes (say 50 to 75% of maximum) until the values can be verified by pile testing.

Given the thickness of Made Ground it may be necessary to consider incorporating in the design of the piles some small allowance for negative skin friction if it is perceived that the material is likely to settle.

For pile groups then the above pile load would need to be reduced to keep settlement within tolerable bounds. Final pile design should be confirmed with pile load tests carried out on working piles taken to 1.5 times its design working load or preferably on piles specifically put down for pile testing where higher loads can be applied. Pile integrity tests should also be carried out on a selection of the piles.

Basements/Ground Floor Slabs

For small presumably lightly loaded structures such as the visitors centre then given the thickness of the Made Ground then a suspended floor slab would be recommended although it may be possible to excavate and re-compact the upper layers of the Made Ground and use a ground bearing slab suitably reinforced.

Many of the ground floor slabs will be below ground level, and therefore, will effectively be basements. Whether these can be designed as ground bearing or have to be piled, will depend on the net loadings. If the loadings are similar to the effective overburden pressure removed, then ground bearing slabs may be feasible. If loads are particularly high then a piled slab may be advisable. This however can only be assessed on a structure by structure basis.

It should be noted that many of the bases will be below the water table and consequently the ground may become disturbed during construction. This disturbance would need to be taken into account when designing foundations. It may also be necessary to consider buoyancy effects given the high water table for certain structures.

It will be necessary to remove all unsuitable materials from beneath the proposed slab location and replace with suitable imported granular fill. Prior to placing the fill the formation should be proof

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rolled and inspected such that any soft spots that develop can be removed and replaced with compacted suitable granular infill. It should be appreciated that the likely formation soil here are sandy and will soften rapidly especially where water is present. In this context it would be recommended that the formation is protected as soon as is feasible following excavation.

7.3 **Excavations and Groundwater**

Any excavations required within the strata observed should be easily accomplished using conventional back-acting hydraulic plant. However excavations may require support even at shallow depths. Any excavation requiring man entry should be fully supported or cut back to a safe slope in accordance with normal safe site practice.

Localised seepages into open trenches at/or above founding depths should be anticipated but should be capable of being controlled through pumping from internal sumps at shallow depths. At depths probably as shallow as 2.5 m (possibly shallower where the site is flooded) the inflows into any excavation may be more significant and consequently additional pumping and or other dewatering may be required. In this context permeabilities based on an assessment of the particle size distribution curves could be as high as 5 x 10⁻³ m/sec. It should be noted that with layered soils, as is the case here with water bearing granular layers sandwiched between cohesive layers, that there is the possibility for local blowing of excavations to occur.

7.4 Infrastructure

For preliminary design of roads and hard-standings a CBR of 2% can be used for a preliminary assessment but such values should be confirmed during construction by in situ CBR testing. It may be possible to use higher values where the soils are granular. The precautions to be taken with regard to the formation should be as discussed under Section 7.1.4 for the floor slabs.

7.5 **Chemical Considerations for Buried Concrete**

The results of twenty one tests for sulphate concentration and pH levels on selected soil samples measured sulphate concentrations of 0.01 to 0.26 grams per litre (as SO₄) and pH levels of 4.9 and 8.9. From these results characteristic values of 0.12 grams per litre for sulphate and pH level of 5.2 would be assessed.

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These test results indicate a Design Sulphate Class 1 (DS-1) and Aggressive Chemical Environment for Concrete Class 3z (AC-3z) (BRE Special Digest 1 (2005)) assuming a brownfield site and a mobile groundwater regime.

8 GEOENVIRONMENTAL ASSESSMENT

8.1 Basis of Assessment

In line with existing legislation and the current regime for contaminated land, the site has been assessed using a risk based approach. To undertake this assessment it is necessary to define a conceptual model for the site which identifies the potential sources of contamination, the receptors and the pathways that can connect them. In order for there to be a risk from contamination, there must first be a source, a receptor (an entity which might be affected by the contamination) and a pathway (or mechanism) by which the receptor can be exposed to the contaminant.

Potential sources of contamination are usually associated with current and historical industrial activities, where the processing, storage, use, transportation and disposal of raw materials, products and wastes often leads to the contamination of underlying ground and groundwater. In addition, natural processes can also give rise to contamination such as hazardous gases.

Potential pathways can include dermal contact with or ingestion / inhalation of contaminated soil, permeable ground conditions, underground voids, services, groundwater flow and abstraction and surface water (flow and abstraction).

Potential receptors can include humans, environmental receptors (watercourses, groundwater and protected sites) and buildings or structures.

8.2 Potential Site Sources of Contamination, Pathways and Receptors

As discussed in Section 6, it is proposed to use the site for a new commercial development. Therefore there is the potential for receptors to be affected by any soil contamination via pathways created during and after the development.

Potential receptors relevant for the site are:

Site workers during future development

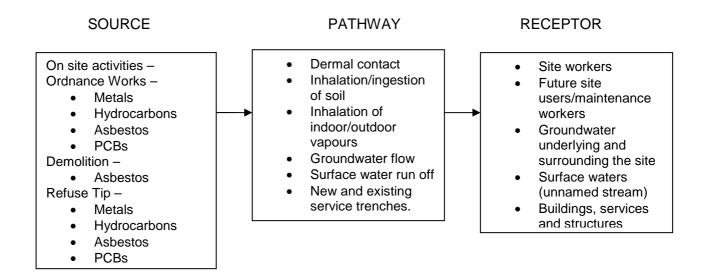


- Future site users and maintenance workers
- Groundwater underlying the site
- A surface watercourse (unnamed stream) along the west boundary of the site.

Potential pathways by which the identified human receptors could be exposed to soil contamination include dermal contact and inhalation and ingestion of soil particles. In the case of the groundwater receptor, a potential pathway exists whereby rainfall could leach out soil contaminants into the groundwater. Contaminants could migrate via groundwater flow to the adjacent watercourse.

The desk study information presented in the report prepared by EL (dated November 2007) on past uses of the site indicates the north east section of the site had been developed previously into an ordnance works and, associated with these works, an area designated as a refuse tip. No details of the contents of the tip are available. The works were demolished in 1978 and no further buildings or works have been constructed on the site. The site was regraded and drainage placed across the site in 1999. The site is currently unoccupied. Potential contaminants could include metals, hydrocarbons, asbestos and polychlorinated biphenyls (PCB) in the area of the former ordnance works and the refuse tip.

The conceptual model is summarised below:



8.3 Soil Contaminants

In order to assess whether there is a source of soil contamination, 53 samples were analysed for pH, metals, polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), sulphate, sulphur, sulphide, total moisture, phenols, cyanide (total and free) chloride and fraction of organic carbon (FOC). Selected samples were also analysed for PCB and screened for asbestos. The chemical analysis results are summarised in the table below.

SUMMARY OF CHEMICAL ANALYSIS RESULTS FOR SOILS FROM GL TO 1.0 m

| DETERMINAND | NUMBER OF | MEASURED CO | NCENTRATIONS | SOIL GUIDELINE | NUMBER EXCEEDING | |
|-----------------------|--------------|-------------|--------------|-------------------|---------------------|--|
| | ANALYSES | MIN. | MAX. | VALUE (SGV) * | SGV | |
| Arsenic | 30 | 4.9 | 13.9 | 500 | 0 | |
| Cadmium | 30 | <0.1 | 2.01 | 1400 | 0 | |
| Chromium (total) | 30 | 7.7 | 44.3 | 5000 | 0 | |
| Chromium (hexavalent) | 30 | <0.1 | <0.1 | 5000 | 0 | |
| Lead | 30 | 8.2 | 187.2 | 750 | 0 | |
| Mercury | 30 | <0.1 | 0.22 | 480 | 0 | |
| Nickel | 30 | <0.5 | 28.2 | 5000 | 0 | |
| Selenium | 30 | <0.5 | 370.6 | 8000 | 0 | |
| Phenol | 30 | <0.5 | <0.6 | 21900 | 0 | |
| Toluene | 30 | <0.011 | <0.032 | 150 | 0 | |
| Ethylbenzene | 30 | <0.011 | <0.032 | 48000 | 0 | |

Notes: *based on end use of commercial/industrial
Units in mg/kg

| DETERMINAND | NUMBER OF | MEASURED (| CONCENTRATIONS | SOIL SCREENING | NUMBER EXCEEDING |
|-------------------------|--------------|------------|----------------|-------------------|---------------------|
| | ANALYSES | MIN. | MAX. | LEVEL (SSL) * | SSL |
| Copper | 30 | 8.2 | 187.2 | 45700 | 0 |
| Zinc | 30 | <1 | 212.4 | 188000 | 0 |
| Boron (water soluble) | 30 | <0.5 | 420 | 314000 | 0 |
| PAH (total) | 30 | <10 | 123 | N/A | N/R |
| TPH | 30 | <11.0 | 1000 | N/A | N/R |
| TPH (>C8 - C10) | 30 | <2 | <3 | N/A | N/R |
| TPH (>C10 - C12) | 30 | <2 | <3 | N/A | N/R |
| TPH (>C12 - C16) | 30 | <2 | 17.6 | N/A | N/R |
| TPH (>C16 - C21) | 30 | <2 | 148 | N/A | N/R |
| TPH (>C16 - C21) | 30 | <4.84 | 727 | N/A | N/R |
| Cyanide (free) | 30 | <0.5 | <0.6 | 11800 | 0 |
| Cyanide (total) | 30 | <0.5 | <0.6 | 11800 | 0 |
| Sulphur | 30 | <19 | 306 | N/C | N/R |
| Sulphate (acid soluble) | 30 | <19 | 1740 | N/C | N/R |
| pH (unitless) | 30 | 7.3 | 10.1 | N/R | N/R |
| Thiocyanate | 30 | <2.2 | <2.5 | N/A | N/R |



| NUMBER OF | | | | NUMBER EXCEEDING |
|--------------|---------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| ANALYSES | MIN. | MAX. | LEVEL (SSL) * | SSL |
| 30 | <0.6 | <0.6 | N/C | N/R |
| 4 | <5.0 | <5.2 | 14.7 | 0 |
| 30 | 0.25 | 3.16 | N/C | N/R |
| 30 | 7.2 | 102 | N/C | N/R |
| 30 | <0.1 | 420 | 31000 | 0 |
| 30 | <0.5 | 3.4 | 314000 | 0 |
| 30 | <0.5 | 1.4 | N/A | N/R |
| 30 | <0.5 | 4.2 | N/A | N/R |
| 30 | <0.023 | <0.063 | 324 | 0 |
| 30 | <0.011 | <0.032 | 1.65 | 0 |
| 30 | 7.3% | 21.5% | N/C | N/R |
| | 30 4 30 30 30 30 30 30 30 30 30 30 30 | OF ANALYSES MIN. 30 <0.6 | OF ANALYSES MIN. MAX. 30 <0.6 | OF ANALYSES MIN. MAX. SCREENING LEVEL (SSL)* 30 <0.6 |

Notes:

*based on end use of commercial/industrial

Units : mg/kg unless stated otherwise N/A = Not available N/R = Not relevant N/C = Not considered hazardous to human health

SUMMARY OF CHEMICAL ANALYSIS RESULTS FOR SOILS FROM BELOW 1.0 m

| DETERMINAND | NUMBER OF | MEASURED CO | NCENTRATIONS | SOIL GUIDELINE | NUMBER EXCEEDING |
|-----------------------|--------------|-------------|--------------|-------------------|---------------------|
| | ANALYSES | MIN. | MAX. | VALUE (SGV) * | SGV |
| Arsenic | 23 | 2.3 | 27.8 | 500 | 0 |
| Cadmium | 23 | <0.1 | 0.77 | 1400 | 0 |
| Chromium (total) | 23 | 7.9 | 19.6 | 5000 | 0 |
| Chromium (hexavalent) | 23 | <0.1 | <0.1 | 5000 | 0 |
| Lead | 23 | 9 | 39.2 | 750 | 0 |
| Mercury | 23 | <0.1 | 0.94 | 480 | 0 |
| Nickel | 23 | 5.1 | 25.4 | 5000 | 0 |
| Selenium | 23 | <0.5 | 1.1 | 8000 | 0 |
| Phenol | 23 | <0.6 | <0.9 | 21900 | 0 |
| Toluene | 23 | <0.011 | <0.290 | 150 | 0 |
| Ethylbenzene | 23 | <0.011 | <0.290 | 48000 | 0 |

Notes:

*based on end use of commercial/industrial

Units in mg/kg

| DETERMINAND | NUMBER OF | MEASURED CONCENTRATIONS | | SOIL SCREENING | NUMBER EXCEEDING |
|-----------------------|--------------|-------------------------|-------|-------------------|---------------------|
| | ANALYSES | MIN. | MAX. | LEVEL (SSL) * | SSL |
| Copper | 23 | 4.2 | 27 | 45700 | 0 |
| Zinc | 23 | 18.7 | 203.1 | 188000 | 0 |
| Boron (water soluble) | 23 | <0.5 | 4.1 | 314000 | 0 |
| PAH (total) | 23 | <10 | 227 | N/A | N/R |
| TPH | 23 | <11 | 611 | N/A | N/R |
| TPH (>C8 - C10) | 23 | <2 | 4.73 | N/A | N/R |
| TPH (>C10 - C12) | 23 | <2 | 29.9 | N/A | N/R |
| TPH (>C12 - C16) | 23 | <2 | 198 | N/A | N/R |
| TPH (>C16 - C21) | 23 | <2 | 223 | N/A | N/R |
| TPH (>C16 - C21) | 23 | <4.85 | 226 | N/A | N/R |



| DETERMINAND | NUMBER OF | MEASURED CONCENTRATIONS | | SOIL SCREENING | NUMBER EXCEEDING | |
|-------------------------|--------------|-------------------------|----------------------|-------------------|---------------------|--|
| | ANALYSES | MIN. | MAX. | LEVEL (SSL) * | SSL | |
| Cyanide (free) | 23 | <0.5 | <0.9 | 11800 | 0 | |
| Cyanide (total) | 23 | <0.5 | <0.9 | 11800 | 0 | |
| Sulphur | 23 | <19 | 968 | N/C | N/R | |
| Sulphate (acid soluble) | 23 | <21 | 2310 | N/C | N/R | |
| pH (unitless) | 23 | 5.8 | 11.5 | N/R | N/R | |
| Thiocyanate | 23 | <2.2 | <3.7 | N/A | N/R | |
| Sulphide | 23 | <0.5 | 15.6 | N/C | N/R | |
| PCB | 1 | <4.9 | <4.9 | 14.7 | 0 | |
| FOC | 23 | 0.16 | 5.08 | N/C | N/R | |
| Chloride | 23 | 9.2 | 101 | N/C | N/R | |
| Barium | 23 | 3 | 611 | 31000 | 0 | |
| Boron | 23 | <0.5 | 4.1 | 314000 | 0 | |
| Antimony | 23 | <0.5 | 1.7 | N/A | N/R | |
| Molybdenum | 23 | <0.5 | 5.3 | N/A | N/R | |
| Xylenes | 23 | <0.022 | <0.581 | 324 | 0 | |
| Benzene | 23 | <0.011 | <0.290 | 1.65 | 0 | |
| Total Moisture | 23 | 8.9% | 45.5% | N/C | N/R | |
| Maria | *1 1 | | - 1 <i>P</i> 1 1 - 1 | 1 | 1 | |

Notes:

*based on end use of commercial/industrial

Units: mg/kg unless stated otherwise

N/A = Not available N/R = Not relevant N/C = Not considered hazardous to human health

Within the United Kingdom the risks posed to human health by soil contaminants are assessed using a number of methodologies. One of these methods is the Contaminated Land Exposure Assessment (CLEA) model. Several versions of the model have been published (DEFRA and EA, 2002a, 2002b and 2002c and EA, 2005b). The 2002 version of model was used by the Environment Agency (EA) to derive Soil Guideline Values (SGVs) for a number of contaminants (DEFRA and EA, 2002d, 2004a, 2004b and 2005). The 2005 version of the model (beta version software) was used by Land Quality Management (LQM, 2007) and by SM to derive Soil Screening Levels (SSLs) for some additional contaminants. The derived SGVs/SSLs are for various site uses.

- Residential with gardens in which plants are grown for human consumption
- Residential with gardens but without plant uptake
- Allotments
- Commercial/industrial use where there are open areas which are not hard surfaced.

Following publication of a new version of the CLEA model in August 2008 (EA, 2008a, 2008b and 2008c), the SGVs derived by the EA and the 2005 version of the model used to derive SSLs have been withdrawn. However, no practical guidance has been provided by the EA as to how to



assess soil contamination in the absence of guideline values/screening levels. Therefore, for the purposes of the current report the previous SGVs and SSLs have been used pending new values being published by the EA or derived from the new software. However, it should be noted that if the new values are higher or lower than the existing values, re-assessment of the contamination may be required.

The SGVs/SSLs represent intervention values which act as indicators to an assessor that soil concentrations above this level might present an unacceptable risk to the health of site users and that further investigation and/or remediation is required. Given the proposed use of the site discussed in Section 8.2, the results in the above tables have been compared with a site use of commercial/industrial.

Where a CLEA SGV is not available for a particular contaminant, a Soil Screening Level (SSL) for commercial/industrial site use derived using the CLEA UK (beta version) software by Land Quality Management (LQM, 2007) or by Soil Mechanics has been utilised.

The chemical analysis results detailed in the above table show that the concentrations of the contaminants which have SGVs or SSLs did not exceed their respective guideline values. Therefore, these contaminants are not considered to pose a risk to site users.

No SGV or SSL is currently available for total PAH or TPH concentrations. However, SSLs have been derived for individual PAH. The most harmful PAH is considered to be benzo(a)pyrene and the SSL for commercial use is 29.7 mg/kg. Benzo(a)pyrene typically comprises 1% of the total (ERL, 1988). As the maximum PAH concentration in soil samples was 227 mg/kg, it is unlikely there will be a risk from benzo(a)pyrene or other PAH contamination to site users.

A range of TPH concentrations (maximum 1000 mg/kg) were encountered in soil samples across the site. Soil samples from trial pit TP2 had TPH concentrations in excess of the limit value for mineral oil (500 mg/kg) in the Landfill Waste Acceptance Criteria (DEFRA, 2004) below which waste including waste soil is considered to be inert. TPH concentrations are therefore considered to pose a potential risk to site users in the vicinity of TP2. However, carbon banding indicates that none of the SSLs for the aromatic and aliphatic fractions of the carbon bands were exceeded. Therefore, no actual risk is considered to be present.

The concentrations of copper, nickel and zinc encountered in soil samples are not considered to be high enough to inhibit plant growth (DE, 1989) in any landscaped areas.

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The levels of phenol indicate that there would be no adverse effect on buried plastics (ERL, 1988 and WRAS, 2002) across the site. Hydrocarbon (PAH, TPH) concentrations indicate there would be no adverse impact on plastic water pipes (WRAS, 2002) across the majority of the site. A potential risk is present in the vicinity of TP2, TP10, TP11, TP12A, TP14, TP15, TP16, BH101, BH105 and BH109 where the guidance value of 50 mg/kg is exceeded.

No bulk asbestos fibres were observed in any of the samples screened for asbestos.

8.5 Groundwater Contaminants

A total of 5 groundwater samples were collected from boreholes standpipes during the investigation and analysed for metals, phenol, cyanide (free and total), sulphide, total sulphate, thiocyanate, pH, TPH, speciated PAH, chloride, fluoride, molybdenum, antimony, ammoniacal nitrogen, chemical oxygen demand (COD), biological oxygen demand (BOD), total organic carbon (TOC) and BETX (benzene, toluene, ethylbenzene and xylenes). The analysis results are summarised in the table below. The groundwater contamination has been assessed by reference to Environmental Quality Standards (EQS) and Environmental Assessment Levels (EAL) for inland waters published by the various Environment Agencies (EA, 2003a) and the Maximum Admissible Concentrations (MAC) presented in the Water Supply (Water Quality) Regulations (DETR 2000).

SUMMARY OF CHEMICAL ANALYSIS RESULTS FOR GROUNDWATER

| DETERMINAND | OF CONCENTRATIONS | | EQS | EAL | MAC | |
|-----------------------|-------------------|--------|--------|-----|---------|---------|
| | ANALYSES | MIN. | MAX. | | | |
| Arsenic | 5 | <1 | 14 | 50 | | 10 |
| Cadmium | 5 | <0.1 | 0.3 | 5 | | 5 |
| Chromium | 5 | 2 | 5 | | 5-50* | 50 |
| Lead | 5 | <1 | 3 | | 4-20* | 25 |
| Mercury | 5 | <0.1 | 0.1 | 1 | | 1 |
| Nickel | 5 | 2 | 15 | | 50-200* | 20 |
| Selenium | 5 | <1 | 4 | | N/L | 10 |
| Copper | 5 | <1 | 6 | | 1-28* | 2000 |
| Zinc | 5 | 19 | 95 | | 8-125* | 5000 |
| Boron | 5 | 30 | 80 | | 2000 | 1000 |
| Phenol | 5 | <50 | <50 | | 30 | 0.5 |
| Cyanide (free) | 5 | <20 | <20 | | 1 | 50 |
| Cyanide (total) | 5 | <20 | <20 | | N/L | N/L |
| Sulphide | 5 | <200 | 1500 | | 0.25** | |
| Total sulphate as SO4 | 5 | 11mg/l | 32mg/l | | N/L | 250mg/l |
| Thiocyanate | 5 | <200 | <200 | | N/L | N/L |
| pH (unitless) | 5 | 6.6 | 7.5 | | 6-9 | 6.5-10 |



| DETERMINAND | NUMBER OF | MEASURED CONCENTRATIONS | | EQS | EAL | MAC |
|-----------------------|--------------|-------------------------|---------|-----|-------|----------|
| | ANALYSES | MIN. | MAX. | | | |
| TPH | 5 | <10 | 140 | | | 10 |
| Naphthalene | 5 | 0.010 | 1.219 | 10 | | |
| Acenaphthylene | 5 | <0.010 | 0.021 | N/L | N/L | N/L |
| Acenaphthene | 5 | <0.010 | 0.755 | N/L | N/L | N/L |
| Fluorene | 5 | <0.010 | 0.478 | N/L | N/L | N/L |
| Phenanthrene | 5 | <0.010 | 0.104 | N/L | N/L | N/L |
| Anthracene | 5 | <0.010 | 0.365 | N/L | N/L | N/L |
| Fluoranthene | 5 | <0.010 | 0.327 | N/L | N/L | N/L |
| Pyrene | 5 | <0.010 | 0.204 | N/L | N/L | N/L |
| Benzo(a)anthracene | 5 | <0.010 | 0.032 | N/L | N/L | N/L |
| Chrysene | 5 | <0.010 | 0.032 | N/L | N/L | N/L |
| Benzo(b)fluoranthene | 5 | <0.010 | 0.020 | | | 0.025*** |
| Benzo(k)fluoranthene | 5 | <0.010 | 0.024 | | | 0.025*** |
| Benzo(a)pyrene | 5 | <0.010 | 0.021 | | | 0.01 |
| Indeno(123-cd)pyrene | 5 | <0.010 | 0.010 | | | 0.025*** |
| Dibenzo(ah)anthracene | 5 | <0.010 | <0.010 | N/L | N/L | N/L |
| Benzo(ghi)perylene | 5 | <0.010 | <0.010 | | | 0.025*** |
| Chloride | 5 | 7mg/l | 27mg/l | N/L | N/L | 200mg/l |
| Fluoride | 5 | 0.2mg/l | 4.2mg/l | N/L | N/L | 1.5mg/l |
| Molybdenum | 5 | <1 | 4 | N/L | N/L | N/L |
| Antimony | 5 | <1 | <1 | N/L | N/L | 5 |
| Ammoniacal Nitrogen | 5 | 190 | 11500 | N/L | 31 | 500 |
| Chromium (hexavalent) | 5 | <10 | <10 | N/L | 5-50* | 50 |
| COD | 5 | 10000 | 80000 | N/L | N/L | N/L |
| Total Organic Carbon | 5 | 4000 | 24000 | N/L | N/L | N/L |
| Barium | 5 | 180 | 300 | N/L | N/L | N/L |
| BOD | 5 | <2000 | 13000 | N/L | N/L | N/L |
| Benzene | 5 | <5 | 9 | 30 | | |
| Xylene | 5 | <10 | <10 | 30 | | |
| Toluene | 5 | <5 | <5 | 50 | | |
| Ethylbenzene | 5 | <5 | <5 | | 20 | |

Notes:

Units: ug/l unless stated otherwise

N/L = not listed

Comparison of the analysis results with the guideline values indicates the groundwater underlying the site is relatively uncontaminated. Many of the analysis results are below the level of detection. It is considered that the majority of the contaminant concentrations in the groundwater do not pose a risk to human health, to groundwater outside the site or to controlled surface waters.

^{*} The EAL varies with water hardness (mg/l CaCO3)
** As hydrogen sulphide

^{*** 25%} of sum of concentrations of benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(123-cd) and benzo(ghi)perylene



However, there is a risk from benzo(a)pyrene contamination in the vicinity of BH101 and TPH contamination in the vicinity of BH101, BH103, BH105 and BH109.

There is a potential risk posed by elevated levels of copper and zinc. However, the actual risk will be dependent on the water hardness. There is also a potential risk from phenol and cyanide contamination. It should be noted that the guidance values for these contaminants are only exceeded as the limit of detection of the analytical method exceeds the guidance value.

8.6 Site Conceptual Model

In Section 8.2 potential sources of contamination, pathways and receptors were identified for the site based on the available information. These potential pollutant linkages constituted the preliminary conceptual model for the site.

The results of the site investigation have been used to refine the conceptual model and to define the specific source-pathway-receptor pollutant linkages for the site based on the proposed development.

The chemical analysis results in Section 8.3 indicate that there are limited sources of soil contamination at the site and therefore limited source-pathway-receptor pollutant linkages. These relate to risks to groundwater from metallic and hydrocarbon contamination and risks to pipes from hydrocarbon contamination.

8.7 Remediation/Recommendations

The levels of contamination in the analysed soil and groundwater samples are low for the analysed contaminants. Based on the available evidence, the site may be developed without the need for remediation to remove the risks to human health.

It is understood that the majority of the site will be covered by hardstanding on completion of the development. However, there will be landscaping in some areas of the site and a series of ponds in the southern section of the site. Therefore some remediation will be required to remove risks to controlled waters from hydrocarbon contamination. It is recommended that the ground in the vicinity of TP2 is excavated and removed to a suitably licensed disposal facility. A considerable depth of excavation (up to 3.50m below ground level) will be required to remove the risk to

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controlled waters and it is recommended that the Environment Agency is consulted about the extent of the remediation.

Further site investigation and chemical analysis is recommended to delineate the TPH contamination in the vicinity of TP2 in order to reduce disposal costs.

Elevated levels of TPH and PAH in some areas of the site have the potential to affect plastic pipes. Where these are being proposed, it is recommended that the ground excavated for the service trenches is disposed of at a suitable licensed landfill facility. Following excavation samples should be taken for chemical analysis in order to confirm the in-situ ground is free from contamination. Should hydrocarbon contamination still be present, the trenches should be lined with an impermeable membrane. The trenches should be backfilled with uncontaminated materials.

Due to the limited nature of all site investigations, there always remains the possibility that pockets of previously undiscovered contamination may be encountered during redevelopment. If any unusual or fibrous materials or signs of contamination spillages are found during the works the area should be fenced off and advice sought on the nature of the possible contamination.

8.8 **Construction Health and Safety**

Based on the chemical analysis results, the levels of the majority of contaminants in the soil at the site are such that they do not pose a particular hazard to ground workers. However, it is considered that TPH contamination could pose a risk to ground workers in the area of TP2.

Contact with soil should be avoided and standard site hygiene procedures should be implemented, such as wearing gloves and overalls and providing adequate washing facilities. Eating, drinking and smoking should be banned in the working areas to prevent inadvertent ingestion of the soil.

8.9 **Disposal of Excavated Materials**

The chemical analysis results in Section 8.3 indicate that the majority of excavated materials may be disposed of as non-hazardous waste (EA, 2004 and 2006). It may be possible to dispose of excavated materials characterised as non-hazardous waste with TPH concentrations less than 500mg/kg as inert waste. However, this will require WAC (Waste Acceptance Criteria) testing of the waste to prove it conforms to the definition of inert waste as set out in the Landfill Regulations (DEFRA, 2002, 2004 and 2005).

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Soils with concentrations of TPH equal to or greater than 1000 mg/kg but less than 10000 mg/kg are potentially hazardous waste. The current classification system (EA, 2007) is based on the total concentration of eight known carcinogenic PAH in the same sample. If the total exceeds 1% of the TPH concentration then the material is hazardous waste.

A sample for TP2 had a TPH concentration of 1000 mg/kg and a total PAH concentration of <10 mg/kg. Although the total concentration of the 8 PAH has not been determined, clearly the threshold (10 mg/kg) can not be exceeded. Therefore, hazardous waste disposal will not be required for excavated materials in the vicinity of TP2.

9 **GAS**

Ground gas is largely generated by the decomposition of organic matter, both in natural soils such as peat, and man made deposits such as landfill or other fill materials. The gases that are normally associated with these materials, and which can pose a risk to health, include methane (which is toxic and also potentially explosive), and carbon dioxide (which is toxic). Oxygen depletion is also a consequence of the generation of these other gases.

For the assessment of sites, in terms of the potential for ground gas to present a hazard, the risk-based methodology detailed in CIRIA Report C659 (2007) is used. The above is primarily based on the main method of characterising a site as proposed by Wilson and Card (1999). This method can be used for all types of development except conventional low-rise housing and therefore is appropriate for the proposed industrial development. The method is predominantly centred on a conceptual model which relates possible sources of gas to likely receptors via potential pathways.

The potential risk associated with gases being generated in the ground (whether from natural or man made sources) depends on the concentrations of gas and its rate of flow to the surface. These factors are assessed by monitoring of the gas installations in the boreholes. The variable nature of gas generation, and the effect of barometric pressure on gas flow, means that the volume of gas potentially reaching the ground surface is normally inconsistent over time. It is therefore necessary to undertake a number of monitoring visits over as long a period as is practical (and preferably with varying atmospheric pressure conditions), to establish the full range of gas conditions at the site.

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Gas monitoring to date has recorded levels of methane up to 1.2% by volume in air while levels of carbon dioxide levels were up to 4.3 % by volume in air. No hydrogen sulphide was encountered. Oxygen levels ranged from 15.4 to 20.8%. The maximum flow rate recorded was 0.4 litre per hour. The readings were taken with atmospheric pressures ranging from 978 to 1013 mb.

The gas screening value is defined as a product of the gas concentration and gas flow, the worst case scenario being established from the highest of each. The highest measured borehole flow rate was 0.4 l/hr and the highest concentration of methane or carbon dioxide was 4.3%. The gas screening value would therefore be 0.02 l/hr, which is within the range for Characteristic Situation 1 (CIRIA R149 (2007)). This is regarded as 'Very Low Risk', and is normally associated with natural organic soils and 'typical made ground'. For the Characteristic Situation 1 no special precautions would normally need to be adopted but as methane levels are over 1 % it may be advisable to carry out a assessment of those parts of the development that may be at risk (eq small enclosed spaces in contact with the ground) of gas accumulation and adopt Characteristic Situation 2 requirements (CIRIA R149 (2007)) where appropriate.

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| | M Varley BSc, PhD, CChem, MRSC |
| Approved for Issue By | |

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ENCLOSURE A EXPLORATORY HOLE RECORDS

Key to Exploratory Hole Records
Borehole Logs
Trial Pit Logs

Key BH101 to 109R TP1 to 17

Key to Exploratory Hole Records



SAMPLES

Р

Undisturbed

Driven tube sample

TW Pushed thin wall tube sample nominally 100 mm diameter and full recovery unless otherwise stated

Pushed piston sample

Liner sample (from Windowless or similar sampler), full recovery unless otherwise stated

CBR CBR mould sample **BLK** Block sample

Core sample (from rotary core) taken for laboratory testing

AMAL Amalgamated sample

Disturbed

Small sample В Bulk sample

Other

Water sample W G Gas sample

Environmental chemistry samples (in more than one container where appropriate)

ES Soil sample EW Water sample

Comments Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that attempt was

made to take a tube sample, however, there was no recovery.

Monitoring samples taken after completion of hole construction are not shown on the exploratory hole logs.

TESTS

Standard Penetration Test, open shoe (S) or solid cone (C) SPT S or SPT C

> The Standard Penetration Test is defined in BS EN ISO 22476-3 (2005). The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 (either in total or for a single increment) the total blow

count beyond the seating drive is given (without the N = prefix).

in situ Vane shear strength, peak (p) and remoulded (r) ΗV Hand vane shear strength, peak (p) and remoulded (r) Pocket penetrometer test, converted to shear strength

Variable head permeability tests (KFH = falling head test, KRH = rising head test, KPI = packer test), permeability value KFH, KRH, KPI

Test results provided in Field Records column

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930 (1999)

Total Core Recovery, % TCR SCR Solid Core Recovery, % **RQD** Rock Quality Designation, %

Fracture spacing, mm. Minimum, typical and maximum spacings are presented. The term

non-intact (NI) is used where the core is fragmented.

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF Core recovered (length in m) in the following run

AZCL Assessed zone of core loss

NR Not recovered

GROUNDWATER

Groundwater strike

Groundwater level after standing period

Notes Project Hirwaun Industrial Estate Project No. Key Carried out for Enviroparks Ltd

Sheet 1 of 3

Key to Exploratory Hole Records



INSTALLATION

Standpipe/ piezometer

Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone:

SP SPIE PPIE

EPIE

Standpipe Standpipe piezometer Pneumatic piezometer Electronic piezometer

Inclinometer or Slip Indicator

The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend

The type of instrument installed is indicated by a code in the Legend column at the base of the tubing:

ICE ICM SLIP

ESET ETM

EPCE PPCE Biaxial inclinometer Inclinometer tubing for use with probe

Slip indicator

Settlement Points or Pressure Cells The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column:

Electronic settlement cell/gauge

Magnetic extensometer settlement point Electronic embedment pressure cell Electronic push in pressure cell

INSTALLATION LEGENDS

A legend describing the installation is shown in the rightmost column. Legends additional to BS5930 are used to describe the backfill materials as indicated below.















Tarmac

NOTES

3

5

6

7

Soils and rocks are described in accordance with BS EN ISO 14688-1 (2002), 14688-2 (2004), 14689-1 (2003) and BS 5930 (1999) as clarified by Baldwin et al (2007).

2 Strata legends are in accordance with BS 5930 (1999).

Water level observations of discernible entries during the advancing of the exploratory hole are given at the foot of the log and in the Legend column. The term "none observed" is used where no discrete entries are identified although this does not necessarily indicate that the hole has not been advanced below groundwater level. Under certain conditions groundwater cannot be observed, for instance, drilling with water flush or overwater, or boring at a rate much faster than water can make its way into the borehole (ref BS5930: 1999, Clause 47.2.7). In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.

Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs, however, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.

The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.

The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures

Notes:

Project Hirwaun Industrial Estate

Project No. H8076
Carried out for Enviroparks Ltd

Key
Sheet 2 of 3

Key to Exploratory Hole Records



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- BS 5930 : 1999 : Code of Practice for site investigations. British Standards Institution

Updated July 2007

Notes:

Project Hirwaun Industrial Estate

Project No. H8076
Carried out for Enviroparks Ltd

Key
Sheet 3 of 3



| Drilled MY Logged PL Checked HW | Start 27/08/2008 End 28/08/2008 | Equipment, Methods at Dando 2000 Hand dug inspection pit GL methods 1.20 - 5.60m. | | | Depth from to Diameter Casing Depth 0.00m 5.60m 200mm 5.60m | Ground Level Coordinates National Grid Chainage | +199.24 mOD E 293941.51 N 206685.12 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------|
| Samples a | nd Tests | | | | Strata | 1 | |
| Depth | Type & No | Records | Date | Time | Description | Depth, Level | Legend Backfill/ |
| 0.30 | ES 1 | | 27/08/2008 | 0800 dry | MADE GROUND: Very dense brown clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with low | (Thickness) | Instruments |
| 0.70 | ES 2 | | | | cobble content. Cobbles are angular to subangular of sandstone. | (1.50) | |
| | SPT C B 3 | 50 (4,10/10,40 for 40mm) | 1.20 | dry | | | |
| 1.50 | ES 4 | | | | MADE GROUND: Dense and medium dense grey and black slightly silty sandy angular to subangular fine to coarse GRAVEL of | 1.50 +197.74 | |
| 2.00-2.45 2.00 | SPT C B 5 | N=36 (10,6/9,9,9,9) | 2.00 | 1.50 | sandstone, concrete and brick with low cobble content. Cobbles are angular to subangular of sandstone, concrete and | | |
| 2.50 | ES 6 | | | | brick. Rare strands of steel wire (10mm). | (2.00) | \gg |
| 3.00-3.45 3.00-3.45 | SPT C B 7 | N=25 (10,11/10,4,6,5) | 3.00 | 1.60 1700 | <u>-</u> | - | |
| 3.50 | ES 8 | | 3.50 | 1.60 | Dense becoming very dense brown and grey clayey sandy subangular to subrounded | 3.50 +195.74 | |
| | SPT C B 9 | N=30 (6,6/10,7,6,7) | 4.00 | 1.60 | fine to coarse GRAVEL of sandstone, siltstone and quartzite with medium cobble content. Cobbles are subangular to subrounded of sandstone and | | |
| 4.50 | ES 10 | | 28/08/2008 3.50 | 0800 1.60 | quartzite. (FLUVIAL GLACIAL DEPOSITS) | (2.10) | ند. د د و ا |
| 5.00-5.45 5.00 | SPT C B 11 | N=25 (4,5/5,6,7,7) | 5.00 | 1.60 | 5.00-5.45 m Medium dense | | الم الم |
| 5.50-5.81 5.60-5.91 | SPT C SPT-C | 50 (10,10/12,20,18 for 10mm) -30 (25,20/20,10,-for 10mm) | 28/08/2008 5.50 - 5.60 | 1700 1.60 1 .60 | EXPLORATORY HOLE ENDS AT 5.60 m | 5.60 +193.64 | |
| •. •- •- | | | | | <u>-</u> | | |
| | | | | | - - - - | | |
| | | | | | <u>-</u> | | |
| | | | | | - - - - | | |
| | | | | | <u>-</u> | | |
| ·· · · | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Depth | Type & No | Records | Date Casing | Time Water | - | | |
| Groundwater Entr No. Struck (m) Properties of the control of the c | ost strike beha | | Depth se | ealed (m) | Depth Related Remarks * From to (m) | 1.20 -1.50 6 1.50 -2.00 9 2.00 -3.00 5 5.00 -5.50 | Fime Tools used 50 mins Chisel 80 mins Chisel 80 mins Chisel 50 mins Chisel |
| Notes: For explana abbreviations see k levels in metres. St in depth column. Scale 1:50 | ey sheet. All de ratum thickness | pths and reduced | Project No Carried ou |). | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | BH101 eet 1 of 1 |



| Drilled KO Logged RF Checked HW | Start 17/09/2008 End 18/09/2008 | Equipment, Methods ar Hands England 36 Hand dug inspection pit GL Rotary open holed 1.20 - 12 Rotary cored 6.00 - 7.50 an | - 1.20m. 2.00m. | | Depth from 0.00m to 12.00m Diamet 142mm 12.00m 18.00m 106mm | m 12.00m | Ground Level Coordinates National Grid Chainage | +199.24 mOD E 293941.51 N 206685.12 |
|--------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------|-------------------------------------------|
| Samples an | d Tests | | | Strata | | | | |
| Depth | Type & No | Records | Date Time Casing Water | | Description | | Depth, Level (Thickness) | Legend Backfill/ Instruments |
| Depth | Type & No | Records | | Made ground sandstone clay and bricks and cond (Driller's description) Small to medium sandy of silty brown clay and la and sandstone boulders description) (FLUVIAL G | gravel and silty rete rubble. gravel with bands rge cobbles (Driller's | | | Legerd Instruments |
| 7.50-7.60 | 0 NR 0 NR 0 NR | SPT C (50 for 100mm) SPT C N=50 (9,10/14,15,15,6 | Date Time | Stratum continues to 44 70 m | | 7.50 m Very dense. | (8.30) | SP SP |
| Depth | TCR SCR RQD If | Records/Samples | Casing Water | Stratum continues to 11.70 m | | | | |
| (m) | st strike behav | viour (fter 20 minutes. slow fter 20 minutes. fast | Depth sealed (m) - - | Depth Related Remarks * From to (m) 0.00 18.00 Air/mist flush | n 100% return. | | Chiselling Depths (m) | Time Tools used |
| Notes: For explanation | on of symbols a | and oths and reduced | Project | Hirwaun Industrial Estate | | | Borehole | |
| levels in metres. Stra in depth column. | tum thickness | given in brackets | Project No. | H8076 | | | В | H101R |
| Scale 1:50 | (c) E: 408 | SGL www.esgl.co.uk 3.24 08/01/2009 16:16:03 | Carried out for | Enviroparks Ltd | | | Sł | neet 1 of 2 |



| Drilled KO Logged RF Checked HW | End | 9/2008 | Equipment, Methods a Hands England 36 Hand dug inspection pit GL Rotary open holed 1.20 - 12 Rotary cored 6.00 - 7.50 ar | 1.20m. 2.00m. | | Depth from 0.00m to 12.00m Diameter 142mm Casing Depth 12.00m 12.00m 18.00m 106mm | Ground Level Coordinates National Grid Chainage | +199.24 mOD E 293941.51 N 206685.12 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------|
| Samples an | nd Te | ests | | | | Strata | 1 | |
| Depth | TCR SCR RQD | lf | Records/Samples | Date Casing | Time Water | Description | Depth, Level (Thickness) | Legend Backfill/ |
| 10.50-10.95 | | | SPT C N=53 (10,12/12,11,15 | | | (Continued from Sheet 1) Small to medium sandy gravel with bands of silty brown clay and large cobbles and sandstone boulders. (Driller's description) (FLUVIAL GLACIAL DEPOSITS) | | 0 |
| - 12.00-12.15 12.00-13.50 | | · | SPT C (50,25) If NI/10/20 C 1 | 12.00 | | Grey siltstone with strong sandstone bands. (Driller's description) (LOWER COAL MEASURES) Strong locally very strong grey MUDSTONE. | 11.70 +187.54 (0.30) 12.00 +187.24 (0.30) 12.30 +186.94 | |
| 12.00-13.50 | 93 52 29 | | | | | Weathering: Dark grey staining on discontinuity surfaces. Discontinuities: Subhorizontal and subvertical extremely closely spaced rough undulating with <1mm silt infill. (LOWER COAL MEASURES) | | |
| 13.50-15.00 | | | C 2 | | | Very strong grey SILTSTONE. Weathering: Dark grey staining on discontinuity surfaces, local weakening penetrating <20mm. Discontinuities: Subhorizontal and 45 | | |
| 13.50-15.00 | 81 60 41 | | | | | degree closely and medium spaced rough and smooth stepped with <1mm silt infill (locally NI). (LOWER COAL MEASURES) | | |
| - 15.00-16.50 | 95 | NI 150 300 | C3 | | | | (5.70) | |
| 15.00-16.50 | 71 49 | | | 17/09/2008 12.00 | | | | |
| 16.71 - 16.50-18.00 | 97 67 | | C 4 | 18/09/2008 12.00 | 0800 0.95 | - | | |
| | 55 | | | 18/09/2008 12.00 | 1200 | | - 18.00 +181.24 | |
| Depth | T T T T T T T T T T T T T T T T T T T | ı If | Records/Samples | Date Casing | Time Water | EXPLORATORY HOLE ENDS AT 18.00 m | | |
| Groundwater Entrie No. Struck Pos (m) | es st strik | e beha | • | Depth se | | Depth Related Remarks * From to (m) | Chiselling Depths (m) T | ime Tools used |
| Notes: For explanational special behavior of the second specia | on of sy y sheet atum thi | . All de ickness | and pths and reduced given in brackets SGL www.esgl.co.uk 8.24 08/01/2009 16:16:04 | Project Project No Carried ou | | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | H101R eet 2 of 2 |



| Drilled MY Logged PL Checked HW | Start 29/08/2008 End 01/09/2008 | Equipment, Methods at Dando 2000 Hand dug inspection pit GL methods 1.20 - 7.50m. | | | Depth from to Diameter Casing Depth 0.00m 7.50m 200mm 7.50m rcussion | Ground Level Coordinates National Grid Chainage | Εź | 9.16 mOD 293857.10 206723.94 |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------|
| Samples ar | nd Tests | | | | Strata | 1 | | |
| Depth | Type & No | Records | Date Casing | Time Water | Description | Depth, Level (Thickness) | Legend | Backfill/ Instruments |
| 0.30 | ES 1 W 2 ES 3 | | 29/08/2008 | | MADE GROUND: Brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with low cobble content. Cobbles are subangular to subrounded of sandstone and quartzite. | (1.70) | | |
| 1.20-1.32 - 1.20 - 1.50 | SPT C B 4 ES 5 | (25,50 for 40mm) | 1.20 | 1.00 | - - - - - - - - | | | |
| 2.00-2.45 - 2.00 | SPT C B 6 | N=23 (7,7/7,7,4,5) | 2.00 | 1.00 | Dense brown and grey clayey slightly sandy subangular to subrounded fine to coarse GRAVEL of sandstone with high cobble content. Cobbles are subangular to subrounded of sandstone and | 1.70 +197.46 | · | |
| 2.50 | ES 7 SPT C B 8 | N=2 (2,1/0,1,0,1) | 3.00 | 1.50 | quartzite. (FLUVIAL GLACIAL DEPOSITS) | (2.20) | • _ • _ • _ • • • • • • • • • • • • • • | |
| 3.45-3.90 | SPT C ES 9 | N=4 (1,1/1,1,1,1) | 3.00 | 1.50 | - - - - - - | | ان ان ان ان ان | |
| 4.00-4.50 | U 10 | 27 mm rec | 29/08/2008 4.50 01/09/2008 | 2.00 | Firm to stiff grey slightly sandy slightly gravelly organic silty CLAY with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite. (GLACIAL | 3.90 +195.26 | | |
| 5.00-5.45 5.00 | SPT C B 12 | N=20 (1,2/4,5,5,6) | 4.50 | 3.40 | TILL) | (1.70) | | |
| | SPT C B 13 | N=30 (4,7/5,5,8,12) | 6.00 | 3.40 | Medium dense brown and pink slightly silty sandy subangular to subrounded fine to coarse GRAVEL of sandstone, siltstone and quartzite with low cobble content. Cobbles are subrounded of pink | 5.60 +193.56 | · | |
| 6.50-6.88 | SPT C | 50 (12,13/18,17,15,- for 5mm) | 6.50 | 3.40 | sandstone. (Red sandstone boulder - Driller's description.) (FLUVIAL GLACIAL DEPOSITS) | (1.60) | | |
| 7.00 - 7.20 7.50-7.95 | B 15 SPT-C | N=4 2 (4,6/1 0 ,10,12,10) - · | 01/09/2008 7.50 -7 .50 · | 1700 3.40 3 .40 | Very dense dark grey subangular fine to coarse GRAVEL of siltstone (Possible bedrock). | 7.20 +191.96 (0.30) 7.50 +191.66 | · | SP |
| · · · · · · · · · · · · · · · · · · · | | | | | EXPLORATORY HOLE ENDS AT 7.50 m | | | |
| | | | | | | | | |
| Depth | Type & No | Records | Date Casing | Time Water | - - - - - | | | |
| Groundwater Entri | es est strike beha | viour | Casing Depth se | | Depth Related Remarks * From to (m) | 1.20 -1.70 1 1.70 -1.70 3 5.60 -5.60 6 6.00 -6.00 9 | ime Tool 50 mins Chis 0 mins Chis 0 mins Chis 0 mins Chis 0 mins Chis | el el el |
| Notes: For explanati abbreviations see ke levels in metres. Stri in depth column. Scale 1:50 | ey sheet. All de atum thickness (c) E | pths and reduced | Project No Carried ou | | Hirwaun Industrial Estate H8076 Enviroparks Ltd | l | H102 eet 1 of 1 | |



| Drilled MY Logged PL Checked HW | ogged PL | | | | Depth from to Diameter Casing Depth 0.00m 8.70m 200mm 8.70m | Ground Level Coordinates National Grid Chainage | +198.88 mOD E 293740.83 N 206755.00 |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|---------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Samples a | nd Tests | | | | Strata | 1 | |
| Depth | Type & No | Records | Date | Time Water | Description | Depth, Level (Thickness) | Legend Backfill/ |
| 0.30 - 0.60 - 0.70 | ES 1 B 2 ES 3 | | Casing | water | MADE GROUND Dense brown clayey sandy angular to subangular fine to coarse GRAVEL of sandstone and quartzite with low cobble content. Cobbles are angular to subangular of sandstone and quartzite. | (Tillckiless) | |
| - - - - - - - - - - - - - - - - - - - | SPT C B 4 ES 5 | N=39 (4,10/10,10,9,10) | 1.20 | damp | - | (2.00) | |
| - - - 2.00-2.45 - 2.00 - - - - 2.50 | SPT C B 6 | N=26 (4,4/6,7,7,6) | 2.00 | 1.50 | Medium dense brown and grey slightly clayey slightly sandy angular to subangular fine to coarse GRAVEL of sandstone and quartzite with medium | 2.00 +196.88 | |
| - 2.60 3.00-3.50 | B 8 | 27 blows | | | cobble content. Cobbles are angular to subangular of sandstone and quartzite. (FLUVIAL GLACIAL DEPOSITS) Soft to firm brown and grey slightly | 2.60 +196.28 | |
| 3.50 3.50 3.50 | D 10 ES 11 | | | | sandy slightly gravelly silty CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite. Cobbles are subangular to subrounded of sandstone and quartzite. (GLACIAL TILL) | | |
| - 4.00-4.45 - 4.00 4.50 | SPT S B 12 ES 13 | N=16 (3,4/4,4,4,4) | 4.00 | 2.00 | and quartitio. (OE OFFIC TIEE) | (3.40) | |
| - - - 5.00-5.45 - 5.00 | SPT S B 14 | N=7 (2,2/2,1,2,2) | 5.00 | 2.60 | 5.00-6.00 m Grey. | | |
| - - - - - - 6.00-6.45 | SPT C | N=8 (2,2/2,2,2,2) | 02/09/2008 5.70 | 2.60 | | 6.00 +192.88 | |
| 6.50 | B 15 ES 16 | (-1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1. | 0.00 | 2.00 | Loose becoming medium dense grey clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone and quartzite with low cobble content. Cobbles are subangular to subrounded of sandstone and quartzite. (FLUVIAL GLACIAL | (1.50) | |
| - 7.00-7.45 - 7.00 | SPT C B 17 | N=25 (4,6/6,6,7,6) | 7.00 | 2.50 | DEPÓSITS) ` | | |
| 7.50 - - - - 8.00-8.45 - 8.00 | SPT C B 19 | N=24 (10,9/8,8,4,4) | 03/09/2008 | 3 1.50 | Medium dense grey and brown slightly clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone, quartzite and mudstone with low cobble content. Cobbles are subangular to subrounded of sandstone and quartzite. (FLUVIAL GLACIAL DEPOSITS) | 7.50 +191.38 (0.50) 8.00 +190.88 (0.60) | |
| 8:70-8:89 8:70 - 8:70 | SPT-C B 20 | – – –50 (25 , f or-0mm/ – – 25,25 for 35mm) | 8.70 - 8 . 70 | 1 .50 | Medium dense brown and grey subrounded COBBLES of sandstone and quartzite with a little clay, sand and gravel. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite. (FLUVIAL GLACIAL DEPOSITS) | 8.60 +190.28 8.70 +190.18 | |
| | Typo 8 No. | Records | Date | Time | Moderately strong to strong grey stained brown SANDSTONE recovered as angular | | |
| (m) | ost strike behav | | Casing Depth s | Water | Depth Related Remarks * From to (m) | 1.20 -1.60 7.80 -7.80 8.40 -8.40 | Time Tools used 00 mins Chisel 15 mins Chisel 15 mins Chisel 15 mins Chisel 15 mins Chisel |
| Notes: For explanat abbreviations see ke levels in metres. Str in depth column. Scale 1:50 | ey sheet. All dep ratum thickness (c) E | oths and reduced | Project No Carried or | | dirwaun Industrial Estate 18076 Enviroparks Ltd | | B H103 eet 1 of 2 |



Equipment, Methods and Remarks
DANDO 2000
Hand dug inspection pit GL - 1.20m. Light cable percussion metods
1.20m to 8.60m. Depth from 0.00m Casing Depth 8.70m Ground Level +198.88 mOD E 293740.83 N 206755.00 Start 02/09/2008 Drilled MY **to** 8.70m Coordinates National Grid Logged PL End Checked HW 03/09/2008 Chainage Samples and Tests **Strata** Depth, Level (Thickness) Date Time Description Backfill/ Depth Type & No Records Legend Casing Water struments cobbles of sandstone. EXPLORATORY HOLE ENDS AT $8.70\ \mathrm{m}$ Date Casing Depth Type & No Records Chiselling Depths (m) **Groundwater Entries** Depth Related Remarks * Struck Post strike behaviour (m) to (m) Time Tools used Depth sealed (m) Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. **Borehole** Project Hirwaun Industrial Estate **BH103** Project No. H8076 (c) ESGL www.esgl.co.uk 408.24 08/01/2009 16:16:09 Carried out for Enviroparks Ltd Sheet 2 of 2 Scale 1:50



Equipment, Methods and Remarks Hands England 36 Rotary open hole GL - 10.00m. Rotary cored 10.00 - 15.50m. **Depth from** 0.00m 10.00m Diameter 142mm 106mm Casing Depth 10.00m Ground Level +198.88 mOD E 293740.83 Start 23/09/2008 **to** 10.00m 15.50m Drilled Coordinate Logged RF N 206755.00 End Checked HW 23/09/2008 Chainage Samples and Tests **Strata** Depth, Level (Thickness) Time Backfill/ Date Description Type & No Records Legend Casing Water strument 23/09/2008 0800 Made ground brown clay and sandy gravel reworked. (Driller's description) (1.50)1.50 +197.38 Small to medium sandy gravel with bands of silty brown clay and large cobbles and sandstone boulders. (Driller's description) (FLUVIAL GLACIAL DEPOSITS) (8.50)Flush: 0.00-15.50 air/mist, 100 % Date Casing Time Water Depth Type & No Records **Groundwater Entries** Depth Related Remarks Chiselling Struck Post strike behaviour Depths (m) Tools used No. Depth sealed to (m) Rose to 1.20 m after 20 minutes. Medium 1.50 Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in death solution. **Borehole** Project Hirwaun Industrial Estate **BH103R** Project No. H8076 (c) ESGL www.esgl.co.uk 408.24 08/01/2009 16:16:10 Carried out for Enviroparks Ltd Sheet 1 of 2 Scale 1:50



| Drilled KO Logged RF Checked HW | End 23/09 | 9/2008 | Equipment, Methods a Hands England 36 Rotary open hole GL - 10.0 Rotary cored 10.00 - 15.50 | 0m. | s | Depth from to Diameter Casing Depth 0.00m 10.00m 142mm 10.00m 10.00m 15.50m 106mm | Ground Level Coordinates National Grid Chainage | +198.88 mOD E 293740.83 N 206755.00 |
|---------------------------------------------------------------------------------------------------|---------------------------------|----------------------|------------------------------------------------------------------------------------------------------|--------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples ar | | ests | | 1 | | Strata | | |
| Depth | TCR SCR RQD | lf | Records/Samples | Date Casing | Time Water | Description (Continued from Sheet 1) | Depth, Level (Thickness) | Legend Backfill/ Instruments |
| 10.00-10.04 10.00-11.00 | 0 0 0 0 | NR NR NR NR | (50 for 40mm) SPT C (50 for 50mm) | | | Badly broken sandstone with large joints filled with brown sandy silt. (Driller's description) (LOWER COAL MEASURES) | (2.00) | SP |
| 12.00-12.01 12.00-13.00 | | | SPT C (50 for 10mm) C 1 | | | Very strong grey fine grained SANDSTONE. Weathering: Orange brown staining on | 12.00 +186.88 | |
| 12.00-13.00 | 98 95 85 | 100 150 580 | | | | discontinuity surfaces. Discontinuities: Subhorizontal above 13.00m closely spaced below 13.00m medium spaced rough planar. (LOWER COAL | | 1 |
| 13.00-14.00 | | | C 2 | | | MEASURĖS) | | |
| 13.00-14.00 | 90 64 64 | | | | | 13.50-13.70 m Discontinuity 45 degrees rough | (3.00) | |
| 14.00-15.50 | | 350 500 730 | C3 | | | planar with orange brown stairing on surface. | | |
| 14.00-15.50 | 65 62 62 | | | | | Discontinuities widely spaced | 15.00 +183.88 | |
| | | NR NR NR | | 23/09/2008 10.00 | 3 1800 2.10 | AZCL. Solid sandstone grey fine grained. (Driller's description) | (0.50) 15.50 +183.38 |) 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 |
| | | | | | | | | |
| Depth Groundwater Entrie | TCR SCR RQD | If | Records/Samples | Date Casing | Time Water | Depth Related Remarks * | Chiselling | |
| No. Struck Po | | e beha | viour | Depth s | ealed (m) | From to (m) | | ime Tools used |
| Notes: For explanationable abbreviations see kelevels in metres. Strain depth column. Scale 1:50 | on of sy y sheet atum thi | . All de ickness | and pths and reduced given in brackets SGL www.esgl.co.uk 8.24 08/01/2009 16:16:11 | Project No Carried or | | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | 1103R eet 2 of 2 |



| Che | ged PL cked HW | Start 04/09/2008 End 08/09/2008 | Equipment, Methods at DANDO 2000 Hand dug inspection pit GL methods1.20 - 10.90m. | | | | Depth from to Dia 0.00m 10.90m 20 | ameter Casing Depth 00mm 10.90m | Ground Level Coordinates National Grid Chainage | E 293794.50 |
|---------------------------------|----------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------|----------------------------------------------------------|------------------------------------------|
| S | amples an | d Tests | | | | Strata | | | | |
| | Depth | Type & No | Records | Date Casing | Time Water | | Description | | Depth, Level (Thickness) | Legend Backfill/ |
| - | 0.30 | ES 1 | | | | MADE GROUND Mediun brown very clayey sandy subrounded fine to coars sandstone and quartzite | subangular to se GRAVEL of with low cobble | | | |
| - - - - | 0.70 | ES 2 | | | | content. Cobbles are sul subrounded of sandston | | - | | |
| - - - - | 1.20-1.65 1.20-1.65 1.50 | SPT C B 3 ES 4 | N=27 (4,4/4,6,10,7) | 1.20 | dry | | | | (2.60) | |
| - - - - | 2.00-2.45 2.00-2.45 | SPT C B 5 | N=48 (10,10/10,12,12,14) | 2.00 | 1.50 | | | - | | |
| - - - - | 2.50 2.60 | ES 6 B 7 | 9711 | | | Soft grey brown and oral sandy slightly gravelly si low cobble content. Grav | Ity CLAY with | | 2.60 +196.6 | 7 |
| - | 3.50 | U 8 ES 9 | 27 blows | 3.00 | 2.00 | to subrounded fine to co sandstone and quartzite subangular to subrounde and quartzite. (GLACIAL | arse of . Cobbles are ed of sandstone | _ | (1.40) | |
| | 4.00-4.45 4.00-4.45 | SPT C B 10 | N=8 (2,2/2,2,2,2) | 4.00 | 1.60 | Soft CLAY with large gra | avel boulders. | | 4.00 +195.2 (0.40) | 7 |
| - - - - | 4.50 | ES 11 | | | | Medium dense soft grey slightly sandy slightly gra CLAY. Gravel is subang | avelly silty ular to subrounded | | 4.40 +194.8 | 7 |
| - - - - | 5.00-5.45 5.00-5.45 | SPT C B 12 | N=18 (10,10/6,4,4,4) | 5.00 | 2.00 | fine to coarse of sandsto quartzite. (GLACIAL TIL | | _ | | · _ · |
| - | 5.50 6.00-6.50 | ES 13 U 14 | 29 blows | 04/09/2008 | 3 2.00 | | | - | (2.60) | |
| - - - - | 6.50 | ES 15 | | | | | | 6.50-7.00 m Dense | | |
| - - - - - - - | 7.00-7.45 7.00-7.45 | SPT C B 16 | N=36 (6,6/8,8,10,10) | 7.00 | 2.60 | Brown and grey slightly sandy slightly gravelly susubrounded COBBLES of quartzite. Gravel is subasubrounded fine to coars | ubangular to of sandstone and ingular to se of sandstone | | 7.00 +192.2 | 7 0 0 0 |
| - | 8.00-8.45 8.00-8.45 | SPT C B 17 | N=50 (6,10/12,12,14,12) | 8.00 | 2.60 | and quartzite. (FLUVIAL DEPOSITS) | GLACIAL | - | | |
| - | 9.00-9.45 9.00-9.45 | SPT C B 18 | N=47 (6,8/10,12,12,13) | 9.00 | 2.60 | | | - | (3.90) | 0 0 1 0 0 ₹ 0 0 € |
| | Denth | Type & No | Records | Date | Time | Stratum continues to 10.90 m | | | | 2 0 0 |
| C | Depth | | Records | Casing | Water | | | | Chicallin | |
| Gro No. | oundwater Entrie Struck Pos (m) 9.10 | es st strike behav | viour | Depth s | ealed (m) 1.50 | Depth Related Remarks * From to (m) | | | . , , | Time Tools used 60 mins Chisel |
| abbr level in de | es: For explanation eviations see key is in metres. Strappth column. | y sheet. All der tum thickness | and pths and reduced given in brackets SGL www.esgl.co.uk 8.24 08/01/2009 16:16:13 | Project No Carried or | 0. | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | | | 3H104 heet 1 of 2 |



| Drilled MY Logged PL Checked HW | Start 04/09/2008 End 08/09/2008 | Equipment, Methods a DANDO 2000 Hand dug inspection pit GL methods1.20 - 10.90m. | | | Depth from to Diame 0.00m 10.90m 200m | cter Casing Depth m 10.90m | Ground Level Coordinates National Grid Chainage | +199.27 mOD E 293794.50 N 206810.29 |
|-----------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples ar | nd Tests | | | | Strata | | | |
| Depth | Type & No | Records | Date Casing | Time Water | Description (Continued from Sheet 1) | | Depth, Level (Thickness) | Legend Backfill/ Instrument |
| 10.00-10.45 10.00-10.45 | SPT C B 19 SPT-C B 20 | N=53 (10,10/12,14,17,10) N=50 (25 fer-70mm/50 for-40mm) | 08/09/2008 | 1.50 | Brown and grey slightly clayey slightly sandy slightly gravelly subangular to subrounded COBBLES of sandstone and quartzite. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite. (FLUVIAL GLACIAL DEPOSITS) EXPLORATORY HOLE ENDS AT 10.90 m | | 10.90 +188.37 | 0 0 0 0 |
| | | | | | | | | |
| | | | | | | | | |
| Depth | Type & No | Records | Date Casing | Time Water | | | | |
| Groundwater Entrie No. Struck Po (m) | st strike beha | | Depth se | ealed (m) | Depth Related Remarks * From to (m) | | 10.50 -10.90 6 | i me Tools used O mins Chisel |
| Notes: For explanation abbreviations see kelevels in metres. Strain depth column. Scale 1:50 | | and pths and reduced given in brackets ESGL www.esgl.co.uk 18.24 08/01/2009 16:16:15 | Project No Carried ou |). | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | | H104 eet 2 of 2 |



| Drilled MY Logged PL Checked HW | Start 15/09/2008 End 15/09/2008 | Equipment, Methods Dando 2000 Hand dug inspection pit G methods1.20 - 6.00m. | | e percussion | Depth from to 0.00m 6.00m | Diameter 200mm Casing Depth 6.00m | Ground Level Coordinates National Grid Chainage | +199.53 mOD E 293875.60 N 206822.06 |
|--------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------|--------------------------------------------------|
| Samples a | nd Tests | | | Strata | | | 1 | |
| Depth | Type & No | Records | Date Tim | е | Description | | Depth, Level | Legend Backfill/ |
| 0.30 | ES 1 | | 15/09/2008 08 | MADE GROUND: grey clayey sandy fine to coarse GR/ quartzite with low Cobbles are subar | Medium dense brown and subangular to subrounded AVEL of sandstone and cobble content. ngular to subrounded of artzite (Re-worked | | (Thickness) | Instrument |
| 1.20-1.65 1.20-1.65 1.50 | SPT C B 3 ES 4 | N=18 (4,3/4,6,4,4) | 1.20 | dry | | | (2.00) | |
| 2.00-2.45 2.00-2.45 2.50 | SPT C B 5 | N=11 (2,2/2,3,3,3) | 2.00 | mottled brown clay subrounded fine to sandstone and qua | coming dense dark grey yey sandy subangular to o coarse GRAVEL of artzite with low cobble | | 2.00 +197.53 | ا ميد |
| 3.00-3.45 3.00-3.45 | SPT C B 7 | N=23 (4,8/8,5,5,5) | 3.00 | content. Cobbles a subrounded of sar (FLUVIAL GLACIA | ndstone and quartzite. | | (2.20) | |
| 3.50 | ES 8 SPT C B 9 | N=38 (4,4/8,6,12,12) | 4.00 | dry | | | | د د مــــــــــــــــــــــــــــــــــ |
| 4.00-4.45 | ES 10 | | | slightly clayey slightly subangular to sub | rounded fine to coarse stone and quartzite with | n - | 4.20 +195.33 | |
| - 5.00-5.45 5.00 | SPT C B 11 | N=29 (12,4/5,8,8,8) | 5.00 3 | subangular to sub and quartzite. (FLI DEPOSITS) | rounded of sandstone | | (1.80) | · |
| 6.00-6.21 · 6.00 | SPT-G B 12 | 50-(14,1-1 for-45mm/ 31,19 for 15mm) | 6.00 3 | 00 10 10 EXPLORATOR' | Y HOLE ENDS AT 6.00 m | | 6.00 +193.53 | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |
| Don't | Tupo 9 No | Pagarda | Date Time | | | | | |
| Depth Groundwater Entri No. Struck Po (m) None observed (s | ost strike beha | Records | Casing Water Depth sealed (m) | Depth Related Rema | arks * | | 5.00 -5.20 3 | ime Tools used 0 mins Chisel 0 mins Chisel |
| Notes: For explanatabbreviations see keevels in metres. Str n depth column. | ey sheet. All de ratum thickness | oths and reduced | Project Project No. Carried out for | Hirwaun Industrial Esta H8076 Enviroparks Ltd | ate | | | . H105 eet 1 of 1 |



| Drilled KO Logged RF Checked HW | End | 9/2008 | Equipment, Methods at Hands England 36 Hand dug inspection pit GL Rotary open holed 1.20 - 9 Rotary cored 9.00 - 14.50r | 1.20m. 0.00m. | is. | | Depth from to Diameter 0.00m 9.00m 142mm 9.00m 14.50m 106mm | Casing Depth 9.00m | Ground Level Coordinates National Grid Chainage | +199.50 mOE E 293875.60 N 206822.00 |
|------------------------------------------------|-------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Samples ar | nd Te | ests | | | | Strata | | | | |
| Depth | | & No | Records | Date | Time | | Description | | Depth, Level | Legend Backfi |
| - | | | | 22/09/2008 | Water 0800 | Made ground brown clay | and sandy gravel | _ | (Thickness) | Instrume |
| | | | | 22/05/2000 | 3 0000 | reworked. (Driller's desc | | = | | \times |
| | | | | | | | | = | | SY241-11 |
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| | | | | | | | | = | (0.00) | |
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| | | | | | | | | = | | \times |
| - | | | | | | Consult to one official consults | | | 2.00 +197.50 | |
| | | | | | | Small to medium sandy of silty brown clay and la | rge cobbles | - | | |
| | | | | | | and sandstone boulders description) (FLUVIAL G | . (Driller's SLACIAL DEPOSITS) | = | | િ.ું પગ |
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| _ | | | Flush: 0.00-14.50 | | | | | | | [~]."# } |
| | | | air/mist, 100 % | | | | | = | | |
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| | | | | | | | | = | | |
| - 8.00-8.06 | SP | тс | (50 for 60mm) | | | - . | | | 8.10 +191.40 | 2 |
| | | | | | | Very dense large sandst medium sandy gravel, po | one boulders with | = | | |
| | | | | | | bedrock. (Driller's descri (FLUVIAL GLACIAL DEF | iption) | = | (0.90) | - o"() -SP |
| | | | | | | WEATHERED BEDROO | | = | (/ | (i). |
| - | | | | | | | | | 9.00 +190.50 | <u>ec : </u> |
| | | | | | | Badly broken sandstone filled with brown sandy s | with large joints ilt. (Driller's | = | | |
| 9.00-10.00 | 0 | NR NR | | | | description) (LOWER C | OAL MEASURES) | = | (1.00) | 111111 |
| J.00-10.00 | 0 | NR | | | | | | = | (1.00) | |
| | | | | | | | | = | | 111111 |
| Depth | TCR SCR RQD | lf | Records/Samples | Date Casing | Time Water | | | • | <u> </u> | ***** |
| Froundwater Entri | ies | | - | • | | Depth Related Remarks * | | | Chiselling | + + + |
| No. Struck Po (m) 1 3.00 Ro 2 8.10 Ro | | | viour Ifter 20 minutes. Medium Ifter 20 minutes. Fast | Depth s | ealed (m) 5.00 | From to (m) | | | Depths (m) 1 | ime Tools used |
| otes: For explanati | ey sheet | . All der | oths and reduced | Project | | Hirwaun Industrial Estate | | | Borehole | |
| els in metres. Str depth column. | atum thi | ckness | given in brackets | Project No | | H8076 | | | BI | H105R |
| | | (c) E | SGL www.esgl.co.uk 8.24 08/01/2009 16:16:18 | Carried or | ut for | Enviroparks Ltd | | | Sh | eet 1 of 2 |



| Drilled KO Logged RF Checked HW | Start 22/09. End 22/09. | /2008 | Equipment, Methods at Hands England 36 Hand dug inspection pit GL Rotary open holed 1.20 - 9. Rotary cored 9.00 - 14.50m | - 1.20m. 00m. | s | | Depth from 0.00m to 9.00m 9.00m 14.50m | Diameter 142mm 9.00m 9.00m | Ground Level Coordinates National Grid Chainage | E 2 | .50 mOD 93875.60 06822.06 |
|---------------------------------------------------------------------------------------------------|----------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|-------------------------|---------------------------------|
| Samples ar | nd To | ete | <u> </u> | | | Strata | | | | | |
| Depth | TCR SCR RQD | | Records/Samples | Date | Time | Strata | Description | | Depth, Level | Legend | Backfill/ |
| . 10.00-10.01 | RQD | " | - | Casing | Water | | tinued from Sheet 1) | | (Thickness) 10.00 +189.50 | | Instrument |
| 10.00-11.50 | 95 83 75 | | SPTC (50 for 10mm) C1 | | | Very strong grey fine gra Weathering: Rare orang on discontinuity surfaces Discontinuities: Subhori degree medium spaced rough planar and rough with <1mm clay infill. (Lo MEASURES) | e brown staining s. zontal and 45 (locally closely) | | 1000 | | |
| 11.50-13.00 | 95 67 | 50 200 | C2 | | | | | | (4.50) | | |
| 13.00-14.50 | 59 | 420 | C3 | | | | | - - - - - | | | |
| 13.00-14.50 | 97 67 | | CS 4 | | | | | | | | |
| - | 63 | | | 22/09/2008 9.00 | 1800 | | | 14.10-14.20 m NI recovered as angular coarse gravel of sandstone. | 14.50 +185.00 | | |
| Depth | ISSE | If | Records/Samples | Date Casing | Time | | | | | | |
| Groundwater Entri No. Struck Po (m) | es | | | Depth se | | Depth Related Remarks * From to (m) | | | Chiselling Depths (m) Ti | ime Tools | sused |
| Notes: For explanati abbreviations see ke evels in metres. Strandepth column. Scale 1:50 | ey sheet. | All de ckness | oths and reduced | Project Project No Carried ou | . | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | | | H105R eet 2 of 2 | |



| Drilled MY Logged PL Checked HW | Start 09/09/2008 End 09/09/2008 | Equipment, Methods at Dando 2000 Hand dug inspection pit GL methods 1.20 - 3.40m. | | | | Depth from 1 0.00m 3 | to Diameter .40m 200mm | Casing Depth 3.40m | Ground Level Coordinates National Grid Chainage | E 2 | 9.80 mOD 193799.73 106899.27 |
|-----------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------|-----------------------|----------------------------------------------------------|---------------------------|------------------------------------|
| Samples ar | nd Tests | | Dete | T: | Strata | B | | | Daniti I I | | D. 1000 |
| Depth | Type & No | Records | Date Casing | Time Water | | Description | | | Depth, Level (Thickness) | Legend | Backfill/ Instruments |
| 0.30 | ES 1 | | 09/09/2008 | 0800 dry | MADE GROUND: Brown subangular to subround GRAVEL of sandstone, with low cobble content. | ed fine to coars quartzite and b Cobbles are | se orick | - - - - | | \otimes | |
| 0.70 | ES 2 | | | | subangular to subround and quartzite. | ed of SandSton | е | | (2.00) | \otimes | |
| - 1.20-1.65 - 1.20 - 1.50 - 1.50 | SPT C B 4 ES 5 | N=14 (3,3/4,4,2,4) | 1.20 | dry | | | | | | | |
| 2.00-2.45 2.00 2.00 | SPT C B 6 | N=13 (3,2/3,3,4,3) | 2.00 | 1.60 | Medium dense becomin clayey sandy subangula fine to coarse GRAVEL | r to subrounde of sandstone a | d ind | | 2.00 +197.80 | | |
| 2.50 | ES 7 | | | | quartzite with medium c Cobbles are subangular sandstone and quartzite GLACIAL DEPOSITS) | to subrounded | t. d of | | (1.20) | <u>.</u> | |
| 3.00-3.43 3.00 | SPT C I B 8 | N=46 (16,9 for 55mm/14,14,9,9) | 1 | 2.00 | Ĺ | | | | 3 20 1106 60 | و عبد " | |
| 3.00 | B8 | 20 (25,30/20 fer 20mm) - · | 10/09/2008 3.40 -3:4 0 | 1200 2.00 2.00 | Very dense brown and g clayey slightly sandy sub subrounded fine to coan sandstone and quartzite content. Cobbles are su subrounded of sandston (FLUVIAL GLACIAL DE EXPLORATORY HOLE | pangular to se GRAVEL of with high cobb bangular to e and quartzite POSITS) | ole e. | | 3.20 +196.60 3.40 +196.40 | | |
| | | | | | | | | | | | |
| | | | | | | | | | 1 | | |
| Depth | Type & No | Records | Date Casing | Time Water | | | | | 1 | | |
| Groundwater Entrie | es st strike beha | | Depth se | | Depth Related Remarks * From to (m) | | | | | ime Tools 05 mins Chis | s used sel |
| Notes: For explanationabbreviations see kellevels in metres. Strain depth column. Scale 1:50 | y sheet. All de atum thickness (c) E | pths and reduced | Project Project No Carried ou | | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | | | | H106 eet 1 of 1 | |



| Drilled MY Logged PL Checked HW | Start 11/09/2008 End 12/09/2008 | Equipment, Methods at Dando 2000 Hand dug inspection pit GL methods 1.20 - 4.20m. | | | ecussion | Depth from to 0.00m 4.20m | Diameter Ca 200mm | asing Depth 4.20m | Ground Level Coordinates National Grid Chainage | E 2 | 9.95 mOD 193981.43 106822.81 |
|-------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------|----------------------|----------------------------------------------------------|---------------------------------------------------------------|------------------------------------|
| Samples an | d Tests | | | | Strata | | | | | | |
| Depth | Type & No | Records | Date Casing | Time Water | | Description | | | Depth, Level (Thickness) | Legend | Backfill/ Instruments |
| 0.30 | ES 1 | | 11/09/2008 | 0800 dry | MADE GROUND: Mediu grey clayey sandy suban fine to coarse GRAVEL quartzite with low cobble Cobbles are subangular | gular to subrounde of sandstone and content. | | | | \times | |
| 0.70 | ES 2 | | | | sandstone and quartzite natural). | | | | (1.80) | $\times\!\!\!\times$ | |
| - 1.20-1.65 - 1.20-1.45 | SPT C B 3 | N=20 (4,2/4,6,6,4) | 1.20 | dry 1700 | | | | - - - - | | | |
| | SPT C B 4 | N=27 (3,3/4,5,9,9) | 2.00 | dry - – – – 1.80 | Medium dense becomin sandy subangular to sub coarse GRAVEL of sand with medium cobble con | rounded fine to Istone and quartzite | | | 1.80 +198.15 | XX. | |
| 2.50 2.50 | ES 5 | | | | subangular to subrounde and quartzite. (FLUVIAL DEPOSITS) | ed of sandstone | | - | (2.00) | | |
| 3.00-3.45 3.00-3.45 | SPT C B 6 | N=37 (4,5/8,9,10,10) | 3.00 | 2.40 | | | | | , , | - | |
| 3.50 | ES 7 | | | | Moderately strong grey s | etained brown | | | 3.80 +196.15 | است. و عبد ا | |
| 4.00-4.09 4.00-4.09 - 4.20-4.26 | SPT C B 8 - SPT C - | (75 for 90mm) | 4.00 12/09/2008 - 4.00 | 3.00 1700 3 .00 | SANDSTONE recovered coarse gravel of sandsto | l as: angular fine to ne. | o | | (0.40) 4.20 +195.75 | | |
| | | | | | | | | | | | |
| Depth | Type & No | Records | Date Casing | Time | | | | | | | |
| Groundwater Entrie | es st strike beha | | Casing Depth se | water ealed (m) | Depth Related Remarks * From to (m) | | | | 1.20 -1.80 9 3.80 -4.00 6 | Time Tool: 00 mins Chise 00 mins Chise 00 mins Chise | s used |
| Notes: For explanation abbreviations see key levels in metres. Strain depth column. Scale 1:50 | y sheet. All der atum thickness | oths and reduced | Project Project No Carried ou | | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | | | | H107 eet 1 of 1 | |



| Drilled KO Logged RF Checked HW | Start 18/09/2008 End 19/09/2008 | Equipment, Methods a Hands England 36 Hand dug inpsection pit GL Rotary open holed 1.20 - 8 Rotary cored 8.50 - 13.50n | 1.20m. .50m. | | | Depth from to 0.00m 8.50 8.50m 13.50 | 0m 142mm | Casing Depth 8.50m | Ground Level Coordinates National Grid Chainage | +199.92 mOD E 293970.55 N 206841.49 |
|-----------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|----------|-----------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples ar | nd Tests | | | | Strata | | | | | |
| Depth | Type & No | Records | | ime ater | | Description | | | Depth, Level | Legend Backfill/ |
| - - - - | | | | 0800 | Made ground sandstone clay and bricks and cond (Driller's description) | gravel and silty crete rubble. | | - - - - | (Thickness) | instruments |
| - - | | | | | | | | | (1.70) | |
| - - - - - - | | | | | Dense small to medium bands of silty brown clay | and large | th | | 1.70 +198.22 | 9 9 9 |
| | | | | | cobbles and sandstone I (Driller's description) (FL DEPOSITS) | | L | 111111111 | | |
| | | | | | | | | 1 | | |
| - - - 4.50-4.95 | SPT C | N=48 (9,10/11,13,12,12) | | | | | | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | (6.60) | |
| | SPT C | N=43 (9,10/10,10,11,12) | | | | | | | | |
| - - - - - - | | Flush: 0.00-13.50 air/mist, 100 % | | | | | | - - - - - | | |
| 7.50-7.95 | SPT C | N=41 (10,10/9,10,11,11) | | | | | | - - - - - | | |
| 8.50-8.51 8.50-10.00 | SPT C C 1 | (50 for 10mm) | | | Badly broken sandstone filled with brown sandy s description) Medium strong locally st | ilt. (Driller's rong grey fine | | | 8.30 +191.62 8.50 +191.42 | |
| 8.50-10.00 | 63 5 0 NI NI 80 | | | | grained SANDSTONE. L as medium to coarse an Weathering: Orange bro on discontinuity surfaces Discontinuities: Intact co closely to closely spaced | gular gravel. wn discolouratic s. are very | | —————————————————————————————————————— | (2.50) | |
| Depth | TCR SCR RQD If | Records/Samples | | me ater | Stratum continues to 11.00 m | | | | | |
| (m) | es est strike beha | viour Ifter 20 minutes. Fast | Depth seale | | Depth Related Remarks * From to (m) | | | | Chiselling Depths (m) | Time Tools used |
| Notes: For explanati abbreviations see ke evels in metres. Stra | on of symbols a | and oths and reduced | Project | | Hirwaun Industrial Estate | | | | Borehole | 14070 |
| levels in metres. Stra in depth column. Scale 1:50 | | SGL www.esgl.co.uk 8.24 08/01/2009 16:16:24 | Project No. Carried out fo | | H8076 Enviroparks Ltd | | | | | H107R leet 1 of 2 |



Equipment, Methods and Remarks Hands England 36 Hand dug inpsection pit GL - 1.20m. Rotary open holed 1.20 - 8.50m. Rotary cored 8.50 - 13.50m. Diameter 142mm 106mm Casing Depth 8.50m Ground Level **to** 8.50m 13.50m +199.92 mOD E 293970.55 Drilled Start 18/09/2008 KO Coordinate Logged RF N 206841.49 End Checked HW 19/09/2008 Chainage Samples and Tests **Strata** Depth, Level (Thickness) Time Backfill/ Date Description Records/Samples Legend Casing Water (Continued from She struments 10.00-11.00 and subvertical smooth stepped, with <2mm sandy silt infill. (LOWER COAL MEASURES) 10.00-11.00 18/09/2008 8.50 11.00 +188.92 11.00-12.00 19/09/2008 No recovery. Badly broken sandstone with large joints filled with brown sandy silt. (Driller's description) (LOWER COAL MEASURES) 8.50 11.00-12.00 (1.00)NR 12.00 +187.92 12.00-12.04 12.00-13.50 SPT C (50 for 40mm) Very strong grey fine grained SANDSTONE. Weathering: Orange brown staining on discontinuity surfaces.
Discontinuities: Subhorizontal and subvertical very closely to closely 12.00-13.50 29 13 30 100 spaced rough planar and smooth stepped. (LOWER COAL MEASURES) (1.50)19/09/2008 1300 -13.50-13.53 -13.50 +186.42 SPT C (80 for 30mm) EXPLORATORY HOLE ENDS AT 13.50 m Depth TCR SCR RQD If Records/Samples **Groundwater Entries** Depth Related Remarks Chiselling Struck Post strike behaviour Depths (m) Time Tools used Depth sealed to (m) Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in death solution. **Borehole** Hirwaun Industrial Estate **BH107R** Project No. H8076 (c) ESGL www.esgl.co.uk 408.24 08/01/2009 16:16:25 Carried out for Enviroparks Ltd Sheet 2 of 2 Scale 1:50



| Drilled MY Logged PL Checked HW | Start 10/09/2008 End 10/09/2008 | Equipment, Methods Dando 2000 Hand dug inspection pit G methods 1.20 - 1.80m. | | cable pe | rcussion | | to Diameter .80m 200mm | Casing Depth 1.80m | Ground Level Coordinates National Grid Chainage | E 2 | 9.87 mOD 293862.79 206911.57 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------|-----------------------|----------------------------------------------------------|----------------------------------|------------------------------------|
| Samples a | nd Tests | | | | Strata | • | | | 1 | | |
| Depth | Type & No | Records | | Time Water | | Description | | | Depth, Level | Legend | Backfill/ Instruments |
| 0.30 | ES 1 | | Casing | vvaler | Very dense brown claye gravelly subangular fine GRAVEL of sandstone a high cobble content. Col subangular of sandstone (FLUVIAL GLACIAL DEI | to coarse and quartzite w obles are and quartzite | | | (Thickness) | | instruments |
| 1.20-1.43 1.20 1.50 | SPT C B 3 ES 4 | 50 (10,12/50) | 1.20 | dry | | | | | (1.80) | , | |
| 1.80 2.62 1.80 1.80 1.80 1.80 1.80 1.80 1.80 1.80 1.80 1.80 1.80 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1.80 - 1. | SPTC D5 | — -50 (25,25/50 for 70mm) - | -1:80 10/09/2008 1:80 | - 4.00 0800 dry | EXPLORATORY HOLE | E ENDS AT 1.80 n | n | | 1.80 +198.07 | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Depth | Type & No | Records | Date Casing V | Time Vater | | | | - | | | |
| Groundwater Entr No. Struck P (m) None observed (s | ost strike beha | | Depth sea | iled (m) | Depth Related Remarks * From to (m) | | | | | i me Tool 0 mins Chise | s used |
| Notes: For explanar abbreviations see k levels in metres. St in depth column. Scale 1:50 | | and oths and reduced given in brackets SGL www.esgl.co.uk 8.24 08/01/2009 16:16:27 | Project No. Carried out | | Hirwaun Industrial Estate H8076 Enviroparks Ltd | | | | | H108 | |



| Drilled KO Logged RF Checked HW | Start 18/09/2008 End 22/09/2008 | Equipment, Methods at Hands England 36 Hand dug inspection pit Gl Rotary open holed 1.20 - 6 Rotary cored 6.00 - 12.00 | L - 1.20m. 5.00m. | Depth from to 0.00m to 0.00m 1.200m Diameter 1.200m Casing Depth 6.00m 6.00m 12.00m 10.00m 6.00m | Ground Level |
|-------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Samples ar | nd Tests | | | Strata | |
| Depth | Type & No | Records | Date Time | Description | Depth, Level Legend Backfill/ |
| Depth | Type & No | Records N=39 (5,7/10,9,9,11) | Casing Water 18/09/2008 0800 | Dense small to medium sandy gravel with bands of silty brown clay and large cobbles and sandstone boulders. (Driller's description) (FLUVIAL GLACIAL DEPOSITS) | (4.60) |
| 4.50-4.95 | SPT C | N=41 (8,9/9,10,9,13) | | Dense large sandstone boulders with — medium sandy gravel possible top of bedrock. (Driller's description) | 4.60 +195.27 |
| 6.00-6.06 - 6.00-7.00 | SPT C 0 0 0 0 | - (50 for 60mm) | 18/09/2008 1800 6.00 22/09/2008 0800 6.00 0.80 | No recovery. Badly broken sandstone with large joints filled with brown sandy silt. (Driller's description) (LOWER COAL MEASURES) | 5.80 +194.07 |
| 7.00-7.02 | 0 0 0 0 NR NR | SPT C (50 for 20mm) SPT C (50 for 10mm) | | | (4.20) |
| 8.00-9.00 - 8.00-9.00 - 9.00-9.06 | 0 0 0 | SPT C (50 for 55mm) | | | |
| 9.00-10.00 | 0 0 0 | Decordo (Comunica | Date Time | - - - - - - - - - - - - - - - - - - - | |
| (m) | st strike beha | viour after 20 minutes. Fast | Casing Water Depth sealed (m) | Depth Related Remarks * From to (m) | Chiselling Depths (m) Time Tools used |
| Notes: For explanation abbreviations see ker levels in metres. Strain depth column. Scale 1:50 | | and pths and reduced given in brackets SGL www.esgl.co.uk 8.24 08/01/2009 16:16:28 | Project No. | Hirwaun Industrial Estate H8076 Enviroparks Ltd | Borehole BH108R Sheet 1 of 2 |



| Drilled KO Logged RF Checked HW | Start 18/09/2008 End 22/09/2008 | Equipment, Methods a Hands England 36 Hand dug inspection pit GL Rotary open holed 1.20 - 6 Rotary cored 6.00 - 12.00n | 1.20m. .00m. | Depth from to Diameter Casing Depth 0.00m 6.00m 142mm 6.00m 6.00m 12.00m 106mm | Ground Level +199.87 mOD E 293862.79 National Grid N 206911.57 Chainage |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Samples ar | nd Tests | | | Strata | |
| Depth | TCR SCR If | Records/Samples | Date Time | Description (Continued from Sheet 1) | Depth, Level Legend Backfill/ |
| Checked HW Samples ar Depth 10.00-10.02 10.00-11.00 10.00-11.00 11.00 11.00-12.00 11.34 11.00-12.00 12.00-12.02 | 22/09/2008 TOR TOR INT 10 NI 10 NI 100 250 250 350 350 If | Rotary open holed 1.20 - 6 Rotary cored 6.00 - 12.00n | Date Time Casing Water | Strata Description (Continued from Sheet 1) Very strong grey fine grained SANDSTONE. Weathering: Orange brown and dark grey staining on discontinuity surfaces. Discontinuities: Subhorizontal and subvertical very closely and closely spaced rough planar, with upto 40mm sandy silt infill. (some core loss). (LOWER COAL MEASURES) Very strong grey fine grained SANDSTONE. Weathering: Slight brown staining on discontinuity surfaces. Discontinuities: Subhorizontal medium spaced rough planar; (LOWER COAL MEASURES) EXPLORATORY HOLE ENDS AT 12.00 m | Depth, Level (Thickness) Legend Backfill (Instruments) |
| Groundwater Entrie No. Struck Pos (m) | | viour | Depth sealed (m) | Depth Related Remarks * From to (m) | Chiselling Depths (m) Time Tools used |
| Notes: For explanationabbreviations see kelevels in metres. Stra | on of symbols y sheet. All de | and epths and reduced s given in brackets | • | Hirwaun Industrial Estate | Borehole BH108R |
| in depth column. Scale 1:50 | | ESGL www.esgl.co.uk 08.24 08/01/2009 16:16:29 | • | H8076 Enviroparks Ltd | Sheet 2 of 2 |



| Drilled MY Logged PL Checked HW | Start 10/09/2008 End 11/09/2008 | Equipment, Methods Dando 2000 Hand dug inspection pit G methods 1.20 - 3.00m. | | percussion | Depth from to 0.00m 3.00 | Diameter C 0m 200mm | Casing Depth 3.00m | Ground Level Coordinates National Grid Chainage | E 2 | 93933.25 06877.21 |
|----------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------|
| Samples a | nd Tests | | | Strata | • | | | 1 | | |
| Depth | Type & No | Records | Date Time | • | Description | | | Depth, Level (Thickness) | Legend | Backfill/ Instruments |
| 0.30 | ES 1 | | Casing Water 10/09/2008 08 | mADE GROUN silty slightly san subangular fine sandstone, bric with medium co | e to coarse GRAVEL of the concrete and quartzite obble content. Cobbles are angular of sandstone, | | | (Tilickness) | X | instruments |
| 1.20-1.29 1.20-1.29 1.50 | SPT C B 3 ES 4 | (75 for 90mm) | 1.20 0.3 | | | | - - - - - - - | (2.80) | | |
| 2.00-2.45 2.00-2.45 | SPT C B 5 | N=31 (10,10/8,7,8,8) | 2.00 1.9 | 50 | | | | | | |
| 2.50 | ES 6 | | 11/09/2008 17/ 3.00 0.3 | 00 | | | - - - - | 2.80 +197.16 | | |
| 3:00-3:96 | SPT-C | (75 for 60mm) | -3:00 0: | SANDSTONE r coarse gravel o weathered bedr | ecovered as: angular fine fandstone (Possible | - to | | 3.00 +196.96 | | SP |
| | | | | | | | | | | |
| Depth Groundwater Entr No. Struck P (m) None observed (| ost strike beha | Records | Date Time Casing Wate Depth sealed (m) | | emarks * | | | 1.20 -1.50 6 1.80 -2.00 3 2.30 -2.50 3 2.50 -2.80 9 | ime Tools 0 mins Chise | el el el |
| Notes: For explana abbreviations see k evels in metres. St in depth column. Scale 1:50 | ey sheet. All de ratum thickness | oths and reduced | Project Project No. Carried out for | Hirwaun Industrial E H8076 Enviroparks Ltd | Estate | | | | H109 eet 1 of 1 | |



| | 0 | Equipment, Methods | e and Romarks | Dimensions and Orientation | | Ground Level | ±10 | 9.65 mOD |
|-----------------------------------------------------------------|------------------------------------|------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------|-----------|-----------------------------|--------------------------------|--------------------------|
| Logged PL | Start 22/08/2008 | CAT 428C | | Width 0.60 m | | Coordinates | E 2 | 293921.63 |
| Checked HW | End 22/08/2008 | Machine excavated tri Pit moved 5.00m NW. | al pit GL - 0.50m. | Length 2.50 m | 305 (Deg) | National Grid Chainage | N 2 | 206645.27 |
| | | | | c | | Chamage | | |
| Samples a | nd Tests | | Strata | | | | • | , |
| Depth | Type & No. | Date Records | Desc | ription | | Depth, Level (Thickness) | Legend | Backfill/ Instruments |
| | | * 0800 | 1 MADE GROUND: Brown clavev sandy | subangular to | | (1.1.0.0.000) | $\times \times \times$ | |
| - | | | MADE GROUND: Brown clayey sandy subrounded fine to coarse GRAVEL of s | andstone and | - | | $\times\!\!\times\!\!\times$ | |
| | | | quartzite. | | .— | (0.50) | $\times\!\!\times\!\!\times$ | |
| | | | | | .— | ` ´ | $\times\!\!\times\!\!\times$ | |
| | | 22/08/2008 dry | | | | | $\times\!\!\times\!\!\!\times$ | |
| | | | EXPLORATORY HOLE ENDS AT | 0.50 m | | 0.50 +199.15 | | |
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| Depth | Type & No. | Records Date | | | - | | | |
| Groundwater Entr | | Date | Depth Related Remarks * | | | Stability Stab | le | ! |
| No. Struck Post Stri (m) | ike Behaviour | | From to (m) | on of blue water of | | Gradinty Stabi | | |
| None observed (se | ee Key Sheet) | | 0.00 0.50 Pit terminated at 0.50m due to discove | ery of blue water pipe marker tape. | | Shoring None | , | |
| | | | | | | Weather Raini | | |
| | | | | | | | 3 | |
| Notes: For explanati | ion of symbols by sheet. All de | and pths and reduced | Project Hirwaun Industrial Estate | | | Trial Pit | | |
| abbreviations see ke evels in metres. Str n depth column. | atum thickness | given in brackets | Project No. H8076 | | |] | ГР1 | |
| Scale 1:25 | (c) E 40 | SGL www.esgl.co.uk 8.24 08/01/2009 13:44:56 | Carried out for Enviroparks Ltd | | | She | et 1 of 1 | |
| | | | | | | | | |



| Logged PL Checked HW | Start 22/08/2008 End 22/08/2008 | Equipment, Methods CAT428C Machine excavated tri | | Dimensions and Orientation Width 0.60 m Length 2.50 m D C | Ground Level Coordinates National Grid Chainage | +199.51 mOD E 293916.98 N 206649.83 |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples ar | nd Tests | | Strata | | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ Instrument |
| *** | | 1000 | MADE GROUND: Brown clayey sandy subrounded fine to coarse GRAVEL of s quartzite. | | 7 0.10 +199. <i>4</i> 1 | |
| 0.30 0.30 | ES 1 D 6 | | 2 MADE GROUND: Dark brown very cla subangular to subrounded fine to coarse | yey sandy c GRAVEL of | 1 | $\otimes\otimes$ |
| 0.50 | B 11 | | sandstone and quartzite with medium or Cobbles are subangular to subrounded quartzite. 3 boulders of 650 x 650m. | obble content. | (0.80) | |
| 0.70 0.70 | ES 2 D 7 | | | | | |
| · · · · · · · · · · · · · · · · · · · | | | 3 MADE GROUND: Soft to firm black gr sandy slightly gravelly silty CLAY with lo content. Gravel is subangular to subrour coarse of sandstone and quartzite. Cobl subangular to subrounded of sandstone brick. | w cobble nded fine to bles are | - 0.90 +198.61 - | |
| 1.50 1.50 1.50 | B 12 ES 3 D 8 | | | | (1.20) | |
| 2.50 2.50 | B 13 ES 4 | | 4 Soft to firm brown mottled orange and sandy slightly gravelly silty CLAY with lo content. Cobbles are subangular to subi sandstone and quartzite. Possible rewormaterial. (GLACIAL TILL) | w cobble rounded of | 2.10 +197.41 | × × × × × × × × × × × × × × × × × × × |
| 2.50 | D9 | | | | (1.70) | × × × × × × × × × × × × × × × × × × × |
| 3.50 3.50 3.50 | D 10 B 14 ES 5 | 22/08/2008 dry | | · · · · · · · · · · · · · · · · · · · | - - - - - - 3.80 +195.71 | × × × × × × × × × × × × × × × × × × × |
| - | | | EXPLORATORY HOLE ENDS AT | 3.00 III | | |
| | | | | | 1 | |
| Depth | Type & No. | Records Date | | | | |
| Groundwater Entri No. Struck Post Stri (m) None observed (se | ike Behaviour | | Depth Related Remarks * From to (m) | | Stability Stab Shoring Non Weather Rain | e |
| Notes: For explanati hbbreviations see ke evels in metres. Stra n depth column. Scale 1:25 | ey sheet. All dep atum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | 'P1A eet 1 of 1 |



Equipment, Methods and Remarks Dimensions and Orientation Ground Level +199.44 mOD Logged PL 22/08/2008 Coordinat F 293949 01 Width 0.60 m Machine excavated trial pit GL - 3.50m. Checked HW National Grid N 206705.96 End 22/08/2008 B - 205 (Deg) Length 2.50 m Chainage Samples and Tests Strata Depth, Level (Thickness) Date Description Backfill/ Depth Type & No. Legend Records 1 MADE GROUND: Dark brown clayey sandy subangular to 0.10 +199.34 subrounded fine to coarse GRAVEL of sandstone and 2 MADE GROUND: Brown clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone and quartzite with low cobble content. Cobbles are 0.30 0.30 ES 1 D 7 0.50 B 13 subangular to subrounded of sandstone and quartzite. 0.70 ES2 (1.30)ES3 1.30 1.40 +198.04 3 MADE GROUND: Dark grey silty sandy subangular to subrounded fine to coarse GRAVEL of sandstone, 1.50 B 14 quartzite and brick with medium cobble content.
Cobbles are subangular to subrounded of sandstone,
quartzite and brick. Rare fragments of glass, metal (0.60)D 10 1.70 1.70 and wall ties. Small pockets of clay. 1 boulder of quartzite (750 x 700mm). 2.00 +197.44 4 MADE GROUND: Soft to firm black , brown and grey slightly sandy slightly gravelly clayey SILT with much decomposed plant material. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite with rare whole bricks. 2.50 B 15 2.70 2.70 2.70-2.80 m [(1.50)ES₅ D 12 ES 6 3.30 22/08/2008 3.50 B 16 3.50 +195.94 EXPLORATORY HOLE ENDS AT 3.50 m Records Date Depth Type & No. Groundwater Entries Depth Related Remarks * Stability Stable No. Struck Post Strike Behaviour (m) From to (m) Remained at 2.40 m after 20 minutes. Seepage Shoring None Weather Raining Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in death solution. Project Hirwaun Industrial Estate Trial Pit TP2 Project No. H8076 (c) ESGL www.esgl.co.uk 408.24 08/01/2009 13:46:17 Carried out for Enviroparks Ltd Sheet 1 of 1 Scale 1:25



Equipment, Methods and Remarks CAT428C Dimensions and Orientation Ground Level +199.66 mOD Logged PL 21/08/2008 Coordinat F 293960 06 Width 0.60 m Machine excavated trial pit GL - 2.30m.

Trench was opened to 6.00m for observation of wall. Checked HW National Grid N 206769.19 End 21/08/2008 в 📥 160 (Deg) Length 6.00 m Chainage Samples and Tests Strata Depth, Level (Thickness) Date Records Backfill/ Type & No. Legend 0800 1 MADE GROUND: Soft brown sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite. (0.30)0.20 0.20 0.20 D 5 B 9 0.30 +199.36 2 MADE GROUND: Orange brown and grey clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone and quartzite with medium cobble content. 0.50 B 10 Cobbles are subangular to subrounded of sandstone and 0.50 0.50 ES2 D6 quartzite. Rare steel bar 15mm x 15mm. Double brick cavity wall at 2.20m depth running at 220 degrees. Bricks are orange red and cement bonded. 1.20 B 11 (2.00)B 12 ES 4 1.90 1.90 2.20 m Brick wall 2.30 +197.36 EXPLORATORY HOLE ENDS AT 2.30 m $\,$ Records Date Depth Type & No. Groundwater Entries Depth Related Remarks * Stability Stable No. Struck Post Strike Behaviour (m) From to (m) 0.00 Seepage from surface Shoring None Weather Raining Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Project Hirwaun Industrial Estate Trial Pit TP3 Project No. H8076 (c) ESGL www.esgl.co.uk 408.24 08/01/2009 13:46:43 Carried out for Enviroparks Ltd Sheet 1 of 1 Scale 1:25



| Logged PL Checked HW | Start 22/08/2008 End 22/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m Length 2.50 m D C B 230 (Deg) | Ground Level Coordinates National Grid Chainage | E 2 | 9.29 mOD 293876.50 206719.70 |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------|------------|------------------------------------|
| Samples a | nd Tests | | Strata | | | _ | |
| Depth | Type & No. | Date Records | Desc | cription | Depth, Level (Thickness) | Legend | Backfill/ Instrumer |
| 0.30 0.30 0.30 0.30 | ES 1 B 11 D 6 | 0800 | MADE GROUND: Soft brown very clay subangular to subrounded fine to coarst sandstone and quartzite with low cobble Cobbles are subangular to subrounded quartzite. 2 MADE GROUND: Brown and grey clay to subrounded fine to coarse GRAVEL of quartzite and brick with low cobble contears subangular to subrounded of sandst and brick. | re GRAVEL of content. of sandstone and subsangular of sandstone, ent. Cobbles | (0.40) 0.40 +198.89 | | |
| 1.30 1.40 1.40 | B 12 ES 3 D 8 | | | | (2.20) | | |
| 2.30 2.40 2.40 | B 13 ES 4 D 9 | | 3 MADE GROUND: Soft to firm grey and sandy slightly gravelly silty CLAY with lo content. Gravel is subangular to subrou coarse of sandstone and quartzite. Cobl subangular to subrounded of sandstone 3 boulders of quartzite 700mm x 700mm | w cobble nded fine to bles are and quartzite. 1. Rare small | 2.60 +196.69 | | |
| 3.30 3.40 3.40 | B 14 D 10 ES 5 | | pockets of black silty sand 100mm x 100 re-worked natural material. | JMM. Possible - - - | (0.90) 3.50 +195.79 | | |
| | | | EXPLORATORY HOLE ENDS AT | | | | |
| | | | | - - - - | | | |
| | | Danasis | | .** | | | |
| Depth | Type & No. | Records Date | | | ļ | | |
| Groundwater Entr No. Struck Post Str (m) None observed (se | ike Behaviour | | Depth Related Remarks * From to (m) | | Stability Stab Shoring Non Weather Rain | e | |
| Notes: For explanat libbreviations see ke evels in metres. Str n depth column. Scale 1:25 | ion of symbols a ey sheet. All dep atum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | TP4 | |



| Logged PL Checked HW | Start 22/08/2008 End 22/08/2008 | Equipment, Methods cat428c Machine excavated tri | | Dimensions and Orientation Width 0.60 m Length 2.50 m D C B 220 (Deg | Ground Level Coordinates National Grid Chainage | +199.27 mOD E 293841.16 N 206752.36 |
|-------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | • | | |
| Depth | Type & No. | Date | | scription | Depth, Level | Legend Backfill/ |
| 0.30 0.30 0.30 0.60 0.60 0.60 | ES 1 B 11 D 6 B 12 ES 2 D 7 | Records 0800 | 1 MADE GROUND: Dark brown clayer subrounded fine to coarse GRAVEL or quartzite with low cobble content. Cobsubangular to subrounded of sandstors. 2 MADE GROUND: Orange brown clast to subrounded fine to coarse GRAVEL quartzite with low cobble content. Cobsubangular to subrounded of sandstors. 3 MADE GROUND: Grey clayey sandsubrounded fine to coarse GRAVEL or quartzite with low cobble content. Cobsubangular to subrounded content. Cobsubangular to coarse GRAVEL or quartzite with low cobble content. Cobsubangular with low cobble content. | f sandstone and bles are ne and quartzite. Interpretation of sandstone and bles are ne and quartzite. Interpretation of sandstone and bles are ne ne and quartzite. In subangular to ne sandstone and bles are ne | (Thickness) (0.40) 0.40 +198.87 (0.30) 0.70 +198.57 | |
| 1.20 1.20 1.20 | B 13 ES 3 D 8 | | subangular to subrounded of sandstor Rare gravel sized lumps of green glas | sy fused slag. | - (0.80) 1.50 +197.77 | |
| 2.00 2.00 2.20 | ES 4 D 9 B 14 | | MADE GROUND: Grey clayey sands subrounded fine to coarse GRAVEL of quartzite with low cobble content. Cobsubangular to subrounded of sandstores. | bles are | (1.10) | |
| 3.00 3.00 3.20 | D 10 ES 5 B 15 | | 5 MADE GROUND: Soft to firm grey b slightly sandy slightly gravelly silty CL/ cobble content. Gravel is subangular t fine to coarse of sandstone, brick and Cobbles are subangular to subrounde quartzite. Rare fragments of cardboar wire. | AY with low o subrounded quartzite. d of sandstone and | - 2.60 +196.67 (1.00) | |
| - | | | EXPLORATORY HOLE ENDS | AT 3.60 m | - 3.60 +195.67 | |
| Depth | Type & No. | Records Date | | | 1 | |
| roundwater Entr lo. Struck Post Str (m) 1 0.00 Seepag | ries rike Behaviour | Date | Depth Related Remarks * From to (m) | | Stability Stab Shoring Non Weather Rain | е |
| lotes: For explanat bbreviations see k evels in metres. Sta depth column. cale 1:25 | ey sheet. All de ratum thickness | oths and reduced | Project Hirwaun Industrial Estat Project No. H8076 Carried out for Enviroparks Ltd | e | 1 | TP5 eet 1 of 1 |



| Logged PL Checked HW | Start 20/08/2008 End 20/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m A Length 2.50 m D C B 212 (Deg) | Ground Level Coordinates National Grid Chainage | +199.05 mOD E 293790.98 N 206748.53 |
|------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ Instrument |
| | | 0800 | MADE GROUND: Soft brown sandy sl silty CLAY. Gravel is subangular to subr to coarse of sandstone and quartzite. | rounded fine | 0.10 +198.95 | |
| 0.30 0.30 0.30 | ES 1 B 13 D7 | | 2 MADE GROUND: Brown clayey sandy subrounded fine to coarse GRAVEL of s quartzite with low cobble content. Cobbl subangular to subrounded of sandstone | andstone and es are | (0.50) | |
| 0.70 0.70 | ES 2 D 8 | | 3 MADE GROUND: Orange brown and subangular to subrounded fine to coarse sandstone and quartzite with low cobble Cobbles are subangular to subrounded | e GRAVEL of content. | - 0.60 +198.45 - - | |
| 0.90 0.90 0.90 | B 14 ES 3 D 9 | | quartzite. Possible re-worked natural ma | aterial | - - - (1.40) | |
| 1.60 1.60 1.60 | D 10 B 15 ES 4 | | | - - - - | | |
| - - - | | | 4 MADE GROUND: Grey mottled black subangular to subrounded fine to coarse sandstone and quartzite with low cobble Cobbles are subangular to subrounded quartzite. Possible re-worked natural management | e GRAVEL of content. of sandstone and | 2.00 +197.05 | |
| 2.60 2.60 2.60 | D11 B16 ES5 | | | - - - - | (1.00) | |
| - | | | 5 Soft to firm grey brown and black clays rare small pockets of black woody peat and rootlets. (ALLUVIUM) | ey SILT with and many roots | (0.50) | X X X X X X X X X X X X X X X X X X X |
| 3.50 3.50 3.50 | D 12 B 17 ES 6 | | EXPLORATORY HOLE ENDS AT | -3.50 m | 3.50 +195.55 | |
| - | | | | - - | | |
| | | | | - - - | | |
| | | | | - - - | | |
| | | | | | | |
| Depth | Type & No. | Records Date | | | | |
| Groundwater Entri lo. Struck Post Stri (m) None observed (se | ike Behaviour | | Depth Related Remarks * From to (m) | | Stability Colla 2.00 Shoring Non Weather Rain | m. e |
| lotes: For explanati bbreviations see ke evels in metres. Str n depth column. Scale 1:25 | ey sheet. All dep atum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | TP6 eet 1 of 1 |



| Logged PL Checked HW | Start 21/08/2008 End 21/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m D A B 140 (Deg) | Ground Level Coordinates National Grid Chainage | +199.20 mOD E 293755.36 N 206802.22 |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | | | |
| Depth | Type & No. | Date Records | Des | cription | Depth, Level (Thickness) | Legend Backfill/ Instrumer |
| 0.30 0.30 0.30 | ES 1 B 13 D 7 | 00800 | MADE GROUND: Brown clayey sand subangular fine to coarse GRAVEL of squartzite with low cobble content. Cobb angular to subangular of sandstone and 2 MADE GROUND: Grey and dark grey angular to subangular fine to coarse GF | andstone and les are displayed displayed and les are displayed and | (0.40) - 0.40 +198.80 | |
| 0.70 0.70 0.70 | B 14 ES 2 D 8 | | sandstone, brick and quartzite with low content. Cobbles are angular to subang sandstone and quartzite. | cobble | (0.55) | |
| 1.20 1.20 1.20 | B 15 ES 3 D 9 | | 3 Brown orange and grey clayey sandy subrounded fine to coarse GRAVEL of quartzite with medium cobble content. (subangular to subrounded of sandstone Possible re-worked material. (FLUVIAL DEPOSITS) | sandstone and Cobbles are e and quartzite. | 0.95 +198.25 | |
| 2.20 2.20 2.20 2.20 | D 10 B 16 ES 4 | | 4 Grey clayey sandy subangular to subicoarse GRAVEL of sandstone and qual cobble content. Cobbles are subangula of sandstone and quartzite. Possible rematerial. (FLUVIAL GLACIAL DEPOSITION OF THE PROPERTY O | rtzite with low r to subrounded -worked | 1.70 +197.50 (1.80) | |
| 3.20 3.20 3.20 | D 11 B 17 ES 5 | | | - - - - - | | |
| 3.70 3.70 3.70 | D 12 B 18 ES 6 | | 5 Soft to firm grey mottled brown and or sandy slightly gravelly silty CLAY with locontent. Gravel is subangular to subroucoarse of sandstone and quartzite. Cobsubangular to subrounded of sandstone (GLACIAL TILL) EXPLORATORY HOLE ENDS A | ow cobble index of the common | (0.30) (0.30) 7 3.80 +195.40 | × × × × × |
| Depth | Type & No. | Records | | - - - - | | |
| Froundwater Entr | 1 | Date | Denth Related Remarks * | | | |
| iroundwater Entr lo. Struck Post Str (m) 1 0.00 Seepag | rike Behaviour | | Depth Related Remarks * From to (m) | | Stability Stab Shoring Non Weather Rain | e |
| lotes: For explanat bbreviations see ke evels in metres. Str a depth column. cale 1:25 | ey sheet. All dep ratum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | TP7 eet 1 of 1 |



| Logged PL Checked HW | Start 21/08/2008 End 21/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m A Length 2.50 m D C | Ground Level Coordinates National Grid Chainage | +199.43 mOD E 293863.26 N 206795.70 |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples and Tests Strata | | | | | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ Instruments |
| | | 0800 | MADE GROUND: Soft brown slightly s gravelly silty CLAY. Gravel is subangula subrounded fine to coarse of sandstone | r to | 0.10 +199.33 | M |
| 0.30 0.30 0.30 | ES 1 B 11 D 6 | | MADE GROUND: Grey clayey sandy s subrounded fine to coarse GRAVEL of s quartzite with medium cobble content. C subangular to subrounded of sandstone | candstone and Cobbles are | (0.60) | |
| 0.60 | ES 2 D 7 | | | | 0.70 +198.73 | |
| 0.80 0.80 0.80 | B 12 ES 3 D 8 | | 3 Orange brown very clayey sandy suba subrounded fine to coarse GRAVEL of s quartzite with medium cobble content. C subangular to subrounded of sandstone Possible re-worked material. Unable to progress below 2.30m. (POS: GLACIAL DEPOSITS) | andstone and cobbles are and quartzite. | | |
| 1.50 1.50 1.50 | B 13 ES 4 D 9 | | | | (1.60) | |
| 2.10 2.10 2.10 | D 10 B 14 ES 5 | | | - - | - 2.30 +197.13 | A |
| | | Records | | | | |
| Depth | Type & No. | Date | Porth Political Proceeds & | | | |
| Groundwater Entries No. Struck Post Strike Behaviour (m) 1 0.00 Strong inflow from surface | | | Depth Related Remarks * From to (m) | | Stability Stab Shoring Non Weather Rain | е |
| Notes: For explanati abbreviations see ke evels in metres. Str n depth column. Scale 1:25 | ey sheet. All dep atum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | TP8 eet 1 of 1 |



| Logged PL Checked HW | Start 21/08/2008 End 21/08/2008 | Equipment, Methods CAT428C Machine excavated tri | | Dimensions and Orientation Width 0.60 m Length 2.50 m D C B 178 (Deg) | Ground Level Coordinates National Grid Chainage | +199.93 mOD E 293971.87 N 206818.72 |
|--------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | • | | |
| Depth | Type & No. | Date Records | | cription | Depth, Level (Thickness) | Legend Backfill/ |
| 0.20 0.20 0.20 0.20 | ES 1 B 11 D 6 | 0800 | 1 MADE GROUND: Soft brown sandy silty CLAY with low cobble content. Grasubangular to subrounded fine to coars and quartzite. Cobbles are subangular of sandstone and quartzite. 2 MADE GROUND: Grey and brown cl to subrounded fine to coarse GRAVEL brick and quartzite with medium cobble Cobbles are subangular to subrounded quartzite. | avel is se of sandstone to subrounded ayey sandy subangular of sandstone, content. | (0.30) - 0.30 +199.63 | |
| 1.40 1.40 | D7 B 13 ES 3 | | 3 MADE GROUND: Grey clayey sandy subrounded fine to coarse GRAVEL of and quartzite with medium cobble cont | sandstone, brick | (1.00) | |
| 1.40 1.40 2.40 2.40 | D8 B 14 ES4 | | and quartzite with medium cobble cont subangular to subrounded of sandston quartzite. | | (1.60) | |
| 2.40 | E54 D9 | | 4 Soft grey slightly sandy slightly grave CLAY with low cobble content. Gravel i subrounded fine to coarse of sandston Cobbles are subangular to subrounded quartzite. (GLACIAL TILL) | s subangular to e and quartzite. | 2.90 +197.03 (0.60) | × |
| 3.40 3.40 3.40 | D 10 B 15 ES 5 | | EXPLORATORY HOLE ENDS A | T 3.50 m | - 3.50 +196.43 | x x |
| | | Bassila | | | | |
| Depth | Type & No. | Records Date | | | | |
| Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet) | | | Depth Related Remarks * From to (m) | | Stability Stab Shoring Non Weather Rain | е |
| lotes: For explanat bbreviations see ke evels in metres. Str depth column. cale 1:25 | ey sheet. All der atum thickness | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | TP9 eet 1 of 1 |



| Logged PL Checked HW | Start 20/08/2008 End 20/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m Length 5.00 m C | Ground Level Coordinates National Grid Chainage | +199.54 mOD E 293832.84 N 206821.27 |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ Instrument |
| 0.30 0.30 0.30 | ES 1 D 5 B 9 | 0800 | MADE GROUND: Brown clayey sandy subrounded fine to coarse GRAVEL of s quartzite. | subangular to candstone and | (0.70) | |
| 0.70 0.70 0.70 | B 10 ES 2 D 6 | | 2 MADE GROUND: Grey and dark grey subangular to subrounded fine to coarse sandstone, brick and quartzite with rare bricks. Rare fragments of steel wire, cla glass. Pit was terminated at 3.10m due to a bla pipe of approximately 9 inches diameter length of the pit. | e GRAVEL of whole y pipe and ack cast iron | 0.70 +198.84 | |
| 1.70 1.70 1.70 | B 11 ES 3 D 7 | | | | (2.40) | |
| 2.70 2.70 2.70 2.70 | B 12 ES 4 D8 | | | - - - - - - | 3.10 +196.44 | |
| | | | EXPLORATORY HOLE ENDS AT | 3.10 m | | |
| | | | | - - - - - | | |
| Depth | Type & No. | Records | | | | |
| Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet) | | Date | Depth Related Remarks * From to (m) 3.10 Cast iron pipe | | Stability Stab Shoring Non Weather Rain | e |
| Notes: For explanati abbreviations see ke levels in metres. Str in depth column. Scale 1:25 | ey sheet. All dep atum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | ГР10 eet 1 of 1 |



| Logged PL Checked HW | Start 20/08/2008 End 20/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m Length 2.50 m D C B 238 (Deg) | Ground Level Coordinates National Grid Chainage | +199.98 mOD E 293809.63 N 206940.04 |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples ar | nd Tests | | Strata | - | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ Instruments |
| 0.30 0.30 0.30 0.60 | ES 1 B 10 D 6 ES 2 | 0800 | 1 MADE GROUND: Soft dark brown san gravelly silty CLAY with low cobble controls subangular to subrounded fine to coar sandstone, brick and quartzite. Cobbles subangular to subrounded of sandstone quartzite. Rare whole bricks. 2 MADE GROUND: Black silty fine SAN 3 MADE GROUND: Soft grey brown and organic silty CLAY. | ent. Gravel se of are brick and | (0.40) - 0.40 +199.58 (0.30) - 0.70 +199.28 | |
| 1.20 1.30 1.30 | B 11 ES 3 D 7 | | 4 MADE GROUND:Stiff brown orange a sandy slightly gravelly silty CLAY with m | edium cobble | (0.70) - - 1.40 +198.58 | 1 V |
| 2.20 2.30 2.30 | B 12 ES 4 D 8 | | content. Ğravel is subangular to subrour coarse of sandstone and quartzite. Cobb subangular to subrounded of sandstone Rare fragments of glass, asbestos ceme | nded fine to bles are and quartzite. | (2.10) | |
| 3.20 3.30 3.30 | B 13 ES 5 D 9 | | | - - - | 3.50 +196.48 | |
| | | | EXPLORATORY HOLE ENDS AT | 3.50 III | | |
| | | | | | 4 | |
| Depth | Type & No. | Records | | - 1 | 1 | |
| Groundwater Entri No. Struck Post Stri (m) 1 1.40 Seepage | es ke Behaviour | Date | Depth Related Remarks * From to (m) | | Stability Stab Shoring None Weather Rain | 9 |
| Notes: For explanati abbreviations see ke levels in metres. Str in depth column. Scale 1:25 | ey sheet. All dep atum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | P11 eet 1 of 1 |



| Logged PL Checked HW | Start 20/08/2008 End 20/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m Length 2.50 m D A C B 225 (Deg) | Ground Level Coordinates National Grid Chainage | +199.83 mOD E 293845.19 N 206914.26 |
|-----------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | | | |
| Depth | Type & No. | Date Records | Descr | ription | Depth, Level (Thickness) | Legend Backfill/ |
| 0.10 0.10 0.10 0.30 0.30 0.50 | ES 1 D 4 B 8 D 5 B 7 ES 2 | 0800 | 1 MADE GROUND: Soft brown clayey sa subrounded fine to coarse GRAVEL of squartzite. 2 Orange brown and grey clayey sandy s subrounded fine to coarse GRAVEL of squartzite with medium cobble content. C subangular to subrounded of sandstone Possible re-worked material. (POSSIBLE GLACIAL DEPOSITS) | andstone and ubangular to andstone and obbles are and quartzite. | 0.10 +199.73 (1.60) | |
| 1.30 1.30 1.30 | ES 3 D6 B9 | | 3 Grey angular COBBLES AND BOULD! | | 1.70 +198.13 | |
| - | | | Quartzite. Possible weathered bedrock. EXPLORATORY HOLE ENDS AT | | 1.80 +198.03 | |
| Depth | Type & No. | Records | | | | |
| iroundwater Entr io. Struck Post Str (m) 1 1.40 Strong i | ries rike Behaviour | Date | Depth Related Remarks * From to (m) | | Stability Collid 1.50 Shoring Non Weather Rain | m. e |
| otes: For explanat obreviations see k vels in metres. Str depth column. cale 1:25 | ey sheet. All der ratum thickness | and oths and reduced given in brackets SGL www.esgl.co.uk | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | P11A eet 1 of 1 |



| Logged PL Checked HW | Start 18/08/2008 End 18/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.60 m Length 2.50 m D C B 265 (Deg. | Ground Level Coordinates National Grid Chainage | +199.90 mOD E 293875.53 N 206902.89 | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|--|
| Samples a | Samples and Tests Strata | | | | | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ | |
| 0.30 0.30 0.30 | ES 1 D 4 B 7 | 0800 | Brown slightly clayey sandy angular fin GRAVEL of sandstone and quartzite with content. Cobbles are angular of sandsto quartzite. Possible weathered bedrock. | e to coarse n high cobble ne and | | | |
| 0.70 0.70 0.70 | ES 2 D 5 B 8 | | | | (1.75) | | |
| 1.30 1.30 1.30 | ES 3 D 6 B 9 | | | | | | |
| | | | EXPLORATORY HOLE ENDS AT | 1.75 m | 1.75 +198.15 | | |
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| | T 6 :: | Records | | | | | |
| Depth Groundwater Entr | Date Date | | | | 01 | | |
| No. Struck Post Strike Behaviour (m) 1 1.70 Seepage | | | From to (m) | | Stability State Shoring Non Weather Hea | е | |
| Notes: For explanation of symbols and bibreviations see key sheet. All depths and reduced evels in metres. Stratum thickness given in brackets in depth column. (c) ESGL www.esgl.co.uk 408.24 08/01/2009 13:54:47 | | | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | Trial Pit TP12 Sheet 1 of 1 | | |



| Logged PL Checked HW | Start 20/08/2008 End 20/08/2008 | Equipment, Methods CAT428C Machine excavated tri Pit was 1.40m from no | al pit GL - 1.80m. | Dimensions and Orientation Width 0.60 m Length 2.50 m D C B 105 (Deg | Ground Level Coordinates National Grid Chainage | E 293 | 56 mOD 3874.48 6934.10 |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------|------------------------------|
| Samples a | nd Tests | | Strata | • | | | |
| Depth | Type & No. | Date Records | | ription | Depth, Level (Thickness) | | Backfill/ |
| 0.20 0.20 0.20 0.20 | ES 1 D 4 B 7 | 0800 | 1 MADE GROUND: Soft dark brown sar gravelly silty CLAY with low cobble controls subangular to subrounded fine to coal sandstone, brick and quartzite. Cobbles subangular to subrounded of sandstone 2 Stiff orange brown and grey slightly sa gravelly silty CLAY with high cobble con is subangular to subrounded fine to coal sandstone and quartzite. Cobbles are su | ent. Gravel rse of are and quartzite. my slightly tent. Gravel rse of | (0.30) = 0.30 +200.26 | | |
| 0.60 0.60 | D5 B8 ES3 | | sandstone and qualitatie. Cobbles are st subrounded of sandstone and quartzite. Unable to progress beyond 1.80m. | | (1.50) | × × × × × × × × × × × × × × × × × × × | |
| 1.50 1.50 | D 6 B 9 | | | | 1 | × × × | |
| | | | | 1.70 m Possible weathered bedrock at base | - - 1.80 +198.76 | × × 1 | |
| | | | | | | | |
| Depth Groundwater Ente | Type & No. | Records Date | Don'th Bolated Bounding * | | | | |
| Groundwater Enti No. Struck Post Sti (m) 1 1.80 Seepag | rike Behaviour | | Depth Related Remarks * From to (m) | | Stability State Shoring Non Weather Rain | e | |
| Notes: For explanat abbreviations see k evels in metres. St n depth column. Scale 1:25 | ey sheet. All dep ratum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk 1.24 08/01/2009 13:55:22 | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | P12A eet 1 of 1 | |



| Logged PL Checked HW | Start 19/08/2008 End 19/08/2008 | Equipment, Methods CAT428C Machine excavated tri | | Ground Level Coordinates National Grid Chainage | +200.39 mOD E 293900.08 N 206910.71 | | | |
|---------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------|--|--|
| Samples a | nd Tests | | Strata | - | | | | |
| Depth | Type & No. | Date Records | Desc | cription | Depth, Level (Thickness) | Legend Backfill/ | | |
| 0.30 0.30 0.30 | ES 1 D 5 B 9 | 0800 | MADE GROUND: Soft black sandy sli silty CLAY with low cobble content. Gra subangular to subrounded fine to coarse brick and quartzite. Cobbles are subang subrounded of sandstone, brick and quartzite. Stiff orange brown and grey slightly sa gravelly silty CLAY with medium cobble Gravel is subangular to subrounded fine. | vel is e of sandstone, gular to artzite. andy slightly content. e to coarse of | (0.35) - 0.35 +200.04 | x | | |
| 0.70 0.70 0.70 | B 10 ES 2 D 6 | | sandstone and quartzite. Cobbles are so subrounded of sandstone and quartzite. weathered bedrock. (GLACIAL TILL) | ubangular to Possible | | × - × - × × × × × × × × × × × × × × × × | | |
| 1.30 1.30 1.30 | B 11 ES 3 D 7 | | | | (1.95) | × × × × × × × × × × × × × × × × × × × | | |
| - | B 12 ES 4 | | EXPLORATORY HOLE ENDS AT | 2.00 m Possible weathered bedrock at base of trial pit. | 2.30 +198.09 | × × × × × × × × × × × × × × × × × × × | | |
| Depth | Type & No. | Records | | | | | | |
| Groundwater Entr No. Struck Post Str (m) 1 1.80 Strong i | ries rike Behaviour | Date | Depth Related Remarks * From to (m) | | Stability Stab Shoring Non Weather Rain | e | | |
| lotes: For explanat bbreviations see k evels in metres. Str d depth column. cale 1:25 | ey sheet. All der ratum thickness | and oths and reduced given in brackets SGL www.esgl.co.uk L24 08/01/2009 13:55:47 | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | • | | |



| Logged PL Checked HW | Start 18/08/2008 End 18/08/2008 | Equipment, Methods and Remarks CAT428C Machine excavated trial pit GL - 2.80m. | | Dimensions and Orientation Width 0.60 m D A Ength 2.50 m D C | Ground Level Coordinates National Grid Chainage | +201.10 mOD E 293926.53 N 206915.37 |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ |
| 0.30 0.30 0.30 | ES 1 D 5 B 9 | 0800 | 1 MADE GROUND: Soft brown sandy sl silty CLAY with low cobble content. Grav subangular to subrounded fine to coarse and quartzite Cobbles are subangular to sandstone and quartzite 2 MADE GROUND: Black and grey silty subangular fine to coarse GRAVEL of sa | vel is s of sandstone s usbrounded of sandy angular to andstone, brick | (0.30) - 0.30 +200.80 (0.50) | |
| 0.70 0.70 0.70 | B 10 ES 2 D 6 | | and mudstone with medium cobble cont subangular to subrounded of sandstone 3 Firm to stiff brown orange and grey sli slightly gravelly silty CLAY with low cobb | and quartzite. ghtly sandy le content. | (0.50) - - 0.80 +200.30 | × - 2 |
| 1.30 1.30 | B 11 ES 3 | | Gravel is subangular to subrounded fine sandstone and quartzite. Cobbles are su subrounded of sandstone and quartzite. re-worked material. (GLACIAL TILL) | ubangular to | - (0.60) | × × × × × × × × × × × × × × × × × × × |
| 1.30 | D7 | | 4 Brown silty very sandy angular to suba to coarse GRAVEL of sandstone and qu cobble content. Cobbles are subangular of sandstone and quartzite. Possible re- material. (FLUVIAL GLACIAL DEPOSIT: | artzite with low to subrounded worked | 1.40 +199.70 | |
| 2.30 2.30 2.30 2.30 | B 12 ES 4 D 8 | | | - - - - | (1.40) | |
| | | | EXPLORATORY HOLE ENDS AT | | 2.80 +198.30 | |
| | | | | | | |
| Depth | Type & No. | Records Date | | | | |
| Groundwater Entr lo. Struck Post Str (m) 1 1.80 Seepag | rike Behaviour | | Depth Related Remarks * From to (m) | | Stability Collision 1.40 Shoring Non Weather Rain | m. e |
| lotes: For explanat bbreviations see ko evels in metres. Str n depth column. cale 1:25 | ey sheet. All dep ratum thickness (c) E | oths and reduced | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | TP15 eet 1 of 1 |



| Logged PL Checked HW | Start 19/08/2008 End 19/08/2008 | Equipment, Methods and Remarks CAT428C Machine excavated trial pit GL - 3.20m. | | Dimensions and Orientation Width 0.60 m Length 2.50 m D C B 292 (Deg) | Ground Level Coordinates National Grid Chainage | +201.48 mOD E 293960.69 N 206892.10 |
|-------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ |
| 0.30 0.30 0.30 | ES 1 D 4 B 7 | 0800 | MADE GROUND: Brown and grey clat to subrounded fine to coarse GRAVEL obrick and quartzite with high cobble con are subangular to subrounded of sandst quartzite. 2 MADE GROUND: Dark grey and gree recovered as angular fine to coarse graving and subrounded fine to coarse GRAVEL of quartzite with medium cobble content. | of sandstone, tent. Cobbles one, brick and in fused slag /el. /yey sandy subangular of sandstone and cobbles are | (0.40) - 0.40 +201.08 - 0.50 +200.98 (0.30) - 0.80 +200.68 | |
| - 1.00 1.00 1.00 | ES 2 D 5 B 8 | | subangular to subrounded of sandstone 4 Stiff brown orange and grey slightly sa gravelly silty CLAY with medium cobble Gravel is subangular to subrounded fine sandstone and quartzite. Cobbles are si subrounded of sandstone and quartzite. re-worked material. (GLACIAL TILL) | indy slightly content. to coarse of ubangular to | | × × × × × × × × × × × × × × × × × × × |
| 2.30 2.30 2.30 2.30 | ES 3 D 6 B 9 | | | | (2.40) | × × × × × × × × × × × × × × × × × × × |
| | | | EXPLORATORY HOLE ENDS AT | | 3.20 +198.28 | × |
| - Ponth | Tupo e Ma | Records | | | | |
| Depth | Type & No. | Date Date | | | | |
| Groundwater Entr No. Struck Post Str (m) 1 0.30 Strong i | rike Behaviour | | Depth Related Remarks * From to (m) | | Stability Colla 2.00 Shoring None Weather Rain | m. e |
| lotes: For explanat bbreviations see k evels in metres. Str depth column. cale 1:25 | ey sheet. All der ratum thickness | oths and reduced | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | P16 eet 1 of 1 |



| Logged PL Checked HW | Start 19/08/2008 End 19/08/2008 | Equipment, Methods CAT428C Machine excavated tria | | Dimensions and Orientation Width 0.80 m | Ground Level Coordinates National Grid Chainage | +203.44 mOD E 293965.94 N 206926.16 |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| Samples a | nd Tests | | Strata | • | | |
| Depth | Type & No. | Date Records | Desc | ription | Depth, Level (Thickness) | Legend Backfill/ |
| 0.30 0.30 0.30 | ES 1 B 13 D 7 | 0800 | MADE GROUND: Firm brown slightly gravelly silty CLAY with medium cobble Gravel is subangular to subrounded fine sandstone, brick and quartzite. Cobbles subangular to subrounded of sandstone quartzite. | content. to coarse of are | (0.90) | |
| 0.70 0.70 0.70 | B 14 ES 2 D 8 | | 2 MADE GROUND: Firm to stiff orange | grov and brown | - - 0.90 +2 <i>0</i> 2. <i>54</i> | |
| - 1.20 - 1.20 - 1.20 | B 15 ES 3 D 9 | | slightly sandy slightly gravelly silty CLAY cobble content. Gravel is subangular to fine to coarse of sandstone and quartzit are subangular to subrounded of sandst quartzite. 3 boulders of quartzite 400mm 1.35m: Black cast iron pipe approximate | with low subrounded e. Cobbles one and a x 400mm. | | 1 |
| 1.50 1.50 1.50 | D 10 B 16 ES 4 | | diameter with a small steel pipe directly An electric cable alongside with a small water pipe alongside the cable. All are a degrees. Black cast iron pipe was encased in gre clay. | plastic at 48 | | |
| 2.50 2.50 2.50 2.50 | D 11 B 17 ES 5 | | | | (2.60) | |
| 3.50 3.50 3.50 3.50 | D12 B18 ES6 | | EXPLORATORY HOLE ENDS AT | 3.50 m | 3.50 +199.94 | |
| | | | | | | |
| Donth | Type 9 No | Records | | | | |
| Groundwater Entr No. Struck Post Str (m) 1 1.30 Strong in | ike Behaviour | Date | Depth Related Remarks * From to (m) | | Stability Coll. 2.00 Shoring Non Weather Rain | m ¯ |
| Notes: For explanat abbreviations see ke levels in metres. Str in depth column. Scale 1:25 | ey sheet. All dep atum thickness (c) E | and oths and reduced given in brackets SGL www.esgl.co.uk 1.24 08/01/2009 13:56:54 | Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd | | | ГР17 eet 1 of 1 |



ENCLOSURE B INSTRUMENTATION AND MONITORING

| Installation Details | B1 |
|------------------------|-------|
| Groundwater Monitoring | B2 |
| Gas Monitoring | B3-B6 |

Groundwater Installation Details

| Hole No | Instrument ID | Installation Type | Date of Installation | Reference depth (mBGL) | Piezometer Diameter (mm) | Top of response zone (mBGL) | Base of response zone (mBGL) | Tubing Completion Details | Headworks | Remarks |
|---------|---------------|-------------------|----------------------|---------------------------|-----------------------------|--------------------------------|---------------------------------|------------------------------|-----------------------|---------|
| BH101R | | SP | 18 Sep 2008 | 0.00 | 50 | 1.00 | 7.00 | Open | Lockable top cover | |
| BH102 | 1 | SP | 1 Sep 2008 | 0.00 | 50 | 1.00 | 7.50 | Gas tap | Lockable top cover | |
| BH103R | | SP | 23 Sep 2008 | 0.00 | 50 | 2.00 | 11.50 | open | lockable top cover | |
| BH105R | | SP | 22 Sep 2008 | 0.00 | 50 | 3.50 | 8.30 | open | lockable top cover | |
| BH109 | | SP | 11 Sep 2008 | 0.00 | 50 | 1.50 | 3.00 | Gas tap | Lockable top cover | |

Carried out for

Enviroparks Ltd

| Borehole | BH101 | BH102 | BH103 | BH104 | BH105 | BH106 | BH107 | BH108 | BH109 |
|------------------------|---------|----------------------------|-------|-----------|------------|-------|----------|-------|-------|
| Date Installed | | | | | | | | | |
| Depth to Base (m) | 5.26 | 6.91 | 12.47 | | 8.27 | | | | 2.58 |
| Ground Level (m A.O.D) | | | | | | | | | |
| Date | | Depth to Water from GL (m) | | | | | | | |
| 06-Oct-08 | 2.42 | 2.24 | 2.10 | | 2.04 | | | | 0.14 |
| 09-Oct-08 | 2.31 | | 2.13 | | 2.06 | | | | 0.10 |
| 17-Oct-08 | 2.39 | 2.21 | 2.12 | | 2.05 | | | | 0.12 |
| 31-Oct-08 | 2.27 | 2.25 | 2.10 | | 2.04 | | | | 0.16 |
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| Remarks: | | | | | | | | | |
| Groundwater Monitoring | Project | | Hirv | vain Indu | ıstrial Es | tate | Contrac | H8076 | |
| Soil Mechanics | Client: | | | | | | Figure N | | |
| Son wechanics | CS B2 | | | | | | | | |

| Date : 09/10/ | /2008 | | Meteorological and Site Conditions |
|----------------------|-------|-----------------------------|------------------------------------|
| Operator: յլ | L | State of ground | Damp |
| | | Wind | Light |
| | | Wind Direction | West |
| | | Cloud Cover | 20% |
| | | Precipitation | None |
| | | Barometric Pressure (mb) | 1013 |
| | | Temperature(deg.C) | 12 |
| | - | | |
| Equipment Used | d: | Multi Gas Meter, Gas Flow M | eter |

| Borehole | Instrument | 02 | CH₄ | CO ₂ | H2S | Flow rate | PID | Water Level |
|----------|------------|--------|--------|-----------------|-------|-----------|-------|-------------|
| | Depth (m) | (%v/v) | (%v/v) | (%v/v) | (ppm) | (Ltr/hr) | (PPM) | (m) |
| BH101 | 5.26 | 19.70 | - | 1.2 | 0.0 | 0.1 | 0.0 | 2.31 |
| BH102 | 6.91 | 17.60 | - | 1.3 | 0.0 | 0.2 | 0.0 | |
| BH103 | 12.47 | 18.20 | - | 1.2 | 0.0 | 0.4 | 0.0 | 2.13 |
| BH105 | 8.27 | 20.10 | • | 0.2 | 0.0 | 0.0 | 0.0 | 2.06 |
| BH109 | 2.58 | 21.00 | - | 0.1 | 0.0 | 0.1 | 0.0 | 0.10 |
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Remarks: CH4 and LEL have been voided due to false readings

| Gas Monitoring / Groundwater | Project: | Hirwaun Inustrial Estate | Contract: | H8076 |
|------------------------------|----------|--------------------------|-----------|-------|
| Soil Mechanics | Client: | Pell Frischmann | Figure: | В3 |

| Date : | 31/10/2008 | | Meteorological and Site Conditions |
|-----------|------------|-----------------------------|------------------------------------|
| Operator: | JL | State of ground | Wet |
| | | Wind | Light |
| | | Wind Direction | Northerly |
| | | Cloud Cover | Clear |
| | | Precipitation | None |
| | | Barometric Pressure (mb) | 988 |
| | | Temperature(deg.C) | 7.5 |
| | | | |
| Equipme | ent Used: | Multi Gas Meter, Gas Flow M | eter |

| Borehole | Instrument | 02 | CH₄ | CO ₂ | H2S | Flow rate | PID | Water Level |
|----------|------------|--------|--------|-----------------|-------|-----------|-------|-------------|
| | Depth (m) | (%v/v) | (%v/v) | (%v/v) | (ppm) | (Ltr/hr) | (PPM) | (m) |
| BH101 | 5.26 | 19.10 | - | 1.3 | - | 0.3 | 0.0 | 2.27 |
| BH102 | 6.91 | 15.40 | - | 1.2 | - | 0.1 | 0.0 | 2.25 |
| BH103 | 12.47 | 17.00 | - | 1.4 | - | 0.2 | 0.0 | 2.10 |
| BH105 | 8.27 | 20.80 | - | 0.0 | - | 0.1 | 0.0 | 2.04 |
| BH109 | 2.58 | 20.70 | - | 0.1 | - | 0.1 | 0.0 | 0.16 |
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Remarks:

| Gas Monitoring / Groundwater | Project: | Hirwaun Industrial Estate | Contract: | H8076 |
|------------------------------|----------|---------------------------|-----------|-------|
| Soil Mechanics | Client: | Pell Frischmann | Figure: | В4 |

| Date : | 07/11/2008 | | Meteorological and Site Conditions | | |
|-----------|------------|---------------------------------|------------------------------------|--|--|
| Operator: | JL | State of ground | Light Rain | | |
| | | Wind | strong | | |
| | | Wind Direction | westerly | | |
| | | Cloud Cover | 30% | | |
| | | Precipitation | slight | | |
| | | Barometric Pressure (mb) | 1011 | | |
| | | Temperature(deg.C) | 6.0 | | |
| | | | | | |
| Equipme | nt Used: | Multi Gas Meter, Gas Flow Meter | | | |

| Borehole | Instrument | O ₂ | CH₄ | CO ₂ | H2S | Flow rate | PID | Water Level |
|----------|------------|----------------|--------|-----------------|-------|-----------|-------|-------------|
| | Depth (m) | (%v/v) | (%v/v) | (%v/v) | (ppm) | (Ltr/hr) | (PPM) | (m) |
| BH101 | 5.26 | 20.10 | 0.5 | 0.0 | 0.0 | 0.1 | 0.0 | 2.30 |
| BH102 | 6.91 | 17.40 | 0.8 | 0.6 | 0.0 | 0.2 | 0.0 | 2.28 |
| BH103 | 12.47 | 17.20 | 1.2 | 0.9 | 0.0 | 0.3 | 0.0 | 2.09 |
| BH105 | 8.27 | 20.40 | 0.7 | 0.2 | 0.0 | 0.1 | 0.0 | 2.09 |
| BH109 | 2.58 | 20.40 | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0.09 |
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Remarks:

| Gas Monitoring / Groundwater | Project: | Hirwaun Industrial Estate | Contract: | H8076 |
|------------------------------|----------|---------------------------|-----------|-------|
| Soil Mechanics | Client: | Pell Frischmann | Figure: | B5 |

| Date : | 11/11/2008 | | Meteorological and Site Conditions | | | |
|-----------|------------|---------------------------------------|------------------------------------|--|--|--|
| Operator: | СР | State of ground | Saturated | | | |
| | | Wind | Strong Gusts | | | |
| | | Wind Direction | West | | | |
| | | Cloud Cover | 90% | | | |
| | | Precipitation | None | | | |
| | | Barometric Pressure (mb) | 978 | | | |
| | | Temperature(deg.C) | 8 | | | |
| | | | | | | |
| Equipme | ent Used: | Used: Multi Gas Meter, Gas Flow Meter | | | | |

| Borehole | Instrument | O ₂ | CH₄ | CO ₂ | H2S | Flow rate | PID | Water Level |
|----------|------------|----------------|--------|-----------------|-------|-----------|-------|-------------|
| | Depth (m) | (%v/v) | (%v/v) | (%v/v) | (ppm) | (Ltr/hr) | (PPM) | (m) |
| BH101 | 5.26 | 19.20 | 0.3 | 4.3 | 0.0 | 0.1 | 0.0 | 2.31 |
| BH102 | 6.91 | 19.70 | 0.3 | 0.4 | 0.0 | 0.1 | 0.0 | 2.31 |
| BH103 | 12.47 | 19.10 | 0.1 | 0.2 | 0.0 | 0.1 | 0.0 | 2.21 |
| BH105 | 8.27 | 19.80 | 0.3 | 0.3 | 0.0 | 0.1 | 0.0 | 2.11 |
| BH109 | 2.58 | 19.70 | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0.04 |
| | | | | | | | | |
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Remarks:

| Gas Monitoring / Groundwater | Project: | Hirwaun Industrial Estate | Contract: | H8076 |
|------------------------------|----------|---------------------------|-----------|-------|
| Soil Mechanics | Client: | Pell Frischmann | Figure: | В6 |



ENCLOSURE C GEOTECHNICAL LABORATORY TEST RESULTS

| Index Properties – Summary of Results | INDX 1 |
|-----------------------------------------------------------------------------|--------------|
| Particle Size Distribution Analyses | PSD 1 to 14 |
| Unconsolidated Undrained Triaxial Compression Tests – Summary of Results | UUSUM 1 |
| Uniaxial Compressive Strength of Rock – Summary of Results | RUCS 1 |
| One Dimensional Consolidation Test | OED 1 to 2 |
| Chemical Tests – Summary of Results | CHEM 1 |
| Compaction tests 2.5 kg method | COMPL 1 to 2 |
| Compaction tests 4.5 kg method | COMPH 1 to 2 |

INDEX PROPERTIES - SUMMARY OF RESULTS Project No **Project Name** H8076 Hirwaun Industrial Estate Sample W_P p_d W_{L} W р < 425 I_{P} μm Depth (m) Hole No. Soil Description Remarks No. type from to Mg/m³ Ma/n Brown grey clayey sandy fine to coarse BH101 9 4.00 4.45 В 7.2 subrounded GRAVEL with high cobble Grey brown slightly sandy CLAY BH102 11 4.70 D 21 4.50 100 34 a 19 15 Brown grey slightly sandy slightly gravelly BH103 12 4.00 В 38 92 s 50 a 27 23 CLAY Brown sandy CLAY BH104 8 3.00 3.50 U 1.44 24 Brown grey slightly gravelly CLAY BH104 12 5.00 5.45 В 19 79 s 26 a 16 10 Brown grey slightly gravelly slightly sandy BH105 7 3.00 20 3.45 В slightly organic SILT with low cobble conte Brown grey slightly clayey very sandy fine to BH109 3 1.20 1.29 В 12 coarse subangular GRAVEL with low cobble Grey brown slightly sandy slightly gravelly TP11 10 0.30 72 s 41 a Orange brown grey slightly gravelly sandy TP11 В 12 2.20 24 92 s 36 a 18 18 Brown grey slightly sandy gravelly CLAY TP12A 5 0.60 D 21 43 a 21 63 s 22 Brown slightly sandy slightly gravelly CLAY TP14 10 0.70 В 18 75 s 38 a 18 20 Brown slightly sandy slightly gravelly CLAY TP15 11 1.30 В 85 s 28 a 11 Brown grey slightly sandy slightly gravelly TP1A 9 2.50 D 19 82 s 31 a 18 13 Grey brown very silty very sandy GRAVEL TP5 13 В 1.20 8.1 with low cobble content Brown grey slightly sandy slightly gravelly TP7 18 3.70 CLAY Brown grey slightly sandy gravelly CLAY TP9 15 3.40 В 68 s 27 a 17 10

General notes: All above tests carried out to BS1377: 1990 definitive method in all cases unless annotated otherwise. See individual test reports for further details.

Key: p bulk density, linear $W_{L \ Liquid \ limit}$ W_{P} Plastic limit <425um preparation p_s particle density

 $P_{\rm d}$ dry density a 4 point cone test NP non - plastic n from natural soil -g = gas jar

w moisture content b 1 point cone test I_P Plasticity Index s sieved specimen -p = small pyknometer

SLR 1
Rev 82
Jul 07

Soil Mechanics

Printed:27/10/2008 14:27

INDX 1

Table

Particle Size Distribution Analysis H8076 Project No Sample BH101 Hole No Details: Depth (m BGL) 4.00 Project Name Hirwaun Industrial Estate Samp No 9 Туре В ID ESGH8076200809020000000246 Spec Ref SILT Medium Coarse SAND GRAVEL CLAY COBBLES **BOULDERS** Fine Fine Coarse Fine Coarse Medium Medium 100 90 80 70 Percent Passing 30 20

1 Particle size mm

| Sievin | g | Sedimentation | | |
|---------------|---------|------------------|-----------|--|
| Particle Size | % | Particle Size | % | |
| mm | Passing | mm | Passing | |
| 125 | 100 | | | |
| 90 | 100 | | | |
| 75 | 100 | | | |
| 63 | 70 | | | |
| 50 | 61 | | | |
| 37.5 | 56 | | | |
| 28 | 48 | | | |
| 20 | 37 | | | |
| 14 | 29 | | | |
| 10 | 25 | | | |
| 6.3 | 21 | | | |
| 5.0 | 20 | | | |
| 3.35 | 18 | | | |
| 2.00 | 17 | | | |
| 1.18 | 17 | | | |
| 0.600 | 16 | | | |
| 0.425 | 16 | | | |
| 0.300 | 15 | Dry mass of sa | ample ka | |
| 0.212 | 15 | Diy illass 01 Sa | ampie, ky | |
| 0.150 | 14 | 4.3 | | |
| 0.063 | 12 | 4.3 | | |

0.01

0.1

| Soil description | Brown grey clayey sandy fine to coarse subrounded GRAVEL with high cobble content | | | | |
|---------------------------------------|-----------------------------------------------------------------------------------|-------------|--------|--|--|
| Preparation / Pretreatment | Sieve: pre dried, | | | | |
| Remarks | | | | | |
| | | Whole | *<60mm | | |
| Sample | Cobbles / boulders | 32 | 0 | | |
| Proportions | Gravel | 51 | 75 | | |
| * .00 | Sand | 5 | 7 | | |
| *<60mm values to aid description only | Silt | silt+clay = | | | |
| 2000. p don't diny | Clay | 12 | 18 | | |

100

1000

10

Uniformity Coefficient D₆₀ / D₁₀ #N/A

| | BS 1377 : Part 2 : 1990 | | | |
|-------------|-------------------------|---------------|--|--|
| Test Method | Sieving | 9.2 wet sieve | | |
| | Sedimentation | none | | |

QA Ref SLR 2.9 Rev 78 Jan 08

10

0.001





Figure

PSD₁

Particle Size Distribution Analysis H8076 Project No Sample BH102 Hole No Details: Depth (m BGL) 6.00 Project Name Hirwaun Industrial Estate Samp No 13 Туре В ID ESGH8076200809160000000263 Spec Ref SILT Medium Coarse SAND GRAVEL CLAY COBBLES **BOULDERS** Fine Fine Coarse Fine Coarse Medium Medium 100 90 80 70 Percent Passing 30 20 10

1 Particle size mm

| Sieving | | Sedimentation | |
|------------------|--------------|------------------|--------------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 99 | | |
| 14 | 98 | | |
| 10 | 94 | | |
| 6.3 | 87 | | |
| 5.0 | 82 | | |
| 3.35 | 74 | | |
| 2.00 | 60 | | |
| 1.18 | 47 | | |
| 0.600 | 26 | | |
| 0.425 | 15 | | |
| 0.300 | 8 | Dry mass of or | ample ka |
| 0.212 | 6 | Dry mass of sa | ampie, kg |
| 0.150 | 5 | 11.1 | |
| 0.063 | 4 | 11.1 | |

0.01

0.1

| Soil description | Brown grey slightly clayey g | ravelly SAN | D |
|---------------------------------------|------------------------------|-------------|--------|
| Preparation / Pretreatment | Sieve: pre dried, | | |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 0 | 0 |
| Proportions | Gravel | 40 | 40 |
| * 00 | Sand | 57 | 57 |
| *<60mm values to aid description only | Silt | silt+clay = | |
| accompaint only | Clay | 3 | 3 |

100

1000

10

Uniformity Coefficient D₆₀ / D₁₀ 6

| | BS 1377 : Part 2 : 1990 | | |
|-------------|-------------------------|---------------|--|
| Test Method | Sieving | 9.2 wet sieve | |
| | Sedimentation | none | |

QA Ref SLR 2.9 Rev 78 Jan 08

0.001





Figure

Particle Size Distribution Analysis H8076 Project No Sample BH103 Hole No Details: Depth (m BGL) 7.00 Project Name Hirwaun Industrial Estate Samp No 17 Туре В ID ESGH8076200809160000000282 Spec Ref SILT Medium Coarse SAND GRAVEL CLAY COBBLES **BOULDERS** Fine Fine Coarse Fine Coarse Medium Medium 100 90 80 70 Percent Passing 30 20 10 0.001 0.01 0.1 1 Particle size mm 10 100 1000

| Sieving | | Sedimentation | |
|---------------|---------|------------------|-----------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 99 | | |
| 20 | 97 | | |
| 14 | 94 | | |
| 10 | 87 | | |
| 6.3 | 76 | | |
| 5.0 | 71 | | |
| 3.35 | 62 | | |
| 2.00 | 50 | | |
| 1.18 | 39 | | |
| 0.600 | 20 | | |
| 0.425 | 12 | | |
| 0.300 | 9 | Dry mass of sa | ample ka |
| 0.212 | 8 | Diy illass 01 Sa | ampie, ky |
| 0.150 | 7 | 8.0 | |
| 0.063 | 6 | 6.0 | |

| Soil description | Brown grey clayey SAND ar | nd GRAVEL | |
|---------------------------------------|---------------------------|-------------|--------|
| Preparation / Pretreatment | Sieve: pre dried, | | |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 0 | 0 |
| Proportions | Gravel | 50 | 50 |
| * 00 | Sand | 44 | 44 |
| *<60mm values to aid description only | Silt | silt+clay = | |
| accompaint only | Clay | 6 | 6 |

Uniformity Coefficient D₆₀ / D₁₀ 9

| | BS 1377 : Part 2 : 1990 | | |
|-------------|-------------------------|---------------|--|
| Test Method | Sieving | 9.2 wet sieve | |
| | Sedimentation | none | |

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

PSD₃

Particle Size Distribution Analysis Project No H8076 Sample Hole No BH104 Details: Depth (m BGL) 8.00 Project Name Hirwaun Industrial Estate Samp No 17 Туре В ID ESGH8076200809160000000302 Spec Ref SAND SILT GRAVEL CLAY COBBLES **BOULDERS** Fine Medium Fine Coarse Fine Medium Coarse Coarse Medium 100 90 80 70 Percent Passing 30 20 10 0 0.001 0.01 0.1 1 Particle size mm 10 100 1000 Sieving Sedimentation COBBLES with much slightly sandy GRAVEL Soil description Particle Size % Particle Size Passing Passing mm mm 100 125 90 100 Preparation / Sieve: pre dried, Pretreatment 75 65 63 33 50 12 Remarks 37.5 4 1 28 20 1 Whole *<60mm Sample 14 1 Cobbles / boulders 72 0 **Proportions** 10 Gravel 27 96 6.3 1 Sand 4 <60mm values to aid Silt silt+clay 5.0 1 description only 3.35 1 Clay 0 0 2.00 1 1.18 0 **Uniformity Coefficient** D₆₀ / D₁₀ 2 0.600 0 0 0.425 0.300 0 BS 1377 : Part 2 : 1990 Dry mass of sample, kg Sieving 0.212 0 **Test Method** wet sieve 0.150 0 Sedimentation none 0.063

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Project No H8076

Project Name Hirwaun Industrial Estate

Sample Hole No
Details: Depth (m BGL)

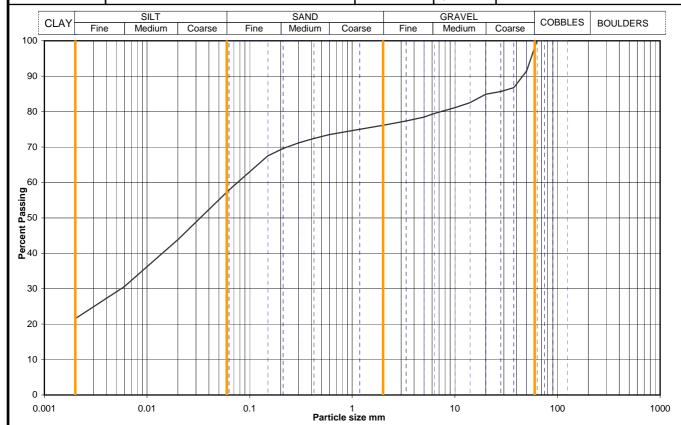
 Depth (m BGL)
 3.00

 Samp No
 7
 Type
 B

 ID
 ESGH80762008091600000000312

BH105

Spec Ref



| Sieving | | Sedimentation | |
|---------------|---------|-------------------|-----------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 44 |
| 90 | 100 | 0.0060 | 31 |
| 75 | 100 | 0.0020 | 22 |
| 63 | 100 | | |
| 50 | 91 | | |
| 37.5 | 87 | | |
| 28 | 86 | | |
| 20 | 85 | | |
| 14 | 83 | | |
| 10 | 81 | | |
| 6.3 | 79 | | |
| 5.0 | 78 | | |
| 3.35 | 77 | | |
| 2.00 | 76 | | |
| 1.18 | 75 | Particle density | / Ma/m2 |
| 0.600 | 74 | Faitible delisity | y, wg/ms |
| 0.425 | 72 | 2.65 a | ssumed |
| 0.300 | 71 | Dry mass of sa | omolo ka |
| 0.212 | 70 | Dry mass of sa | ampie, kg |
| 0.150 | 67 | 9.3 | |
| 0.063 | 58 | 9.3 | |

| Soil description | Brown grey slightly gravelly slightly sandy slightly organic SILT with low cobble content | | |
|------------------------------------------|-------------------------------------------------------------------------------------------|-----------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: | as BS1377 | , |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 2 | 0 |
| Proportions | Gravel | 22 | 22 |
| * 00 | Sand | 19 | 19 |
| *<60mm values to aid description only | Silt | 36 | 37 |
| 2221publi biliy | Clay | 21 | 21 |

Uniformity Coefficient D₆₀ / D₁₀ #N/A

| | BS 1377 : Part 2 : 1990 | | |
|-------------|-------------------------|---------------|--|
| Test Method | Sieving | 9.2 wet sieve | |
| | Sedimentation | 9.4 pipette | |

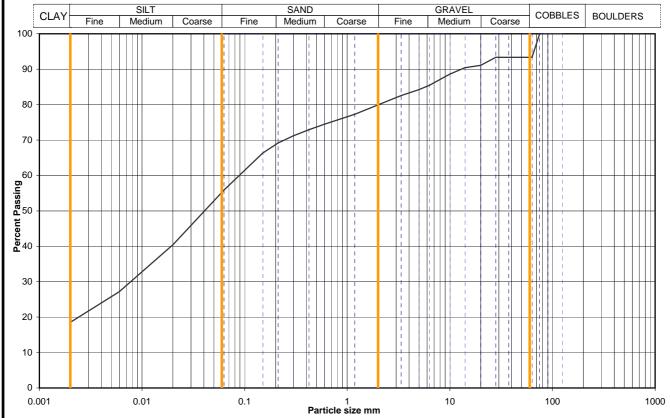
QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Particle Size Distribution Analysis Project No H8076 Sample BH106 Hole No Details: Depth (m BGL) 2.00 Project Name Hirwaun Industrial Estate Samp No 6 Туре В ID ESGH8076200809160000000322 Spec Ref SAND GRAVEL



| Sieving | | Sedimentation | |
|---------------|---------|------------------|-----------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 40 |
| 90 | 100 | 0.0060 | 27 |
| 75 | 100 | 0.0020 | 19 |
| 63 | 93 | | |
| 50 | 93 | | |
| 37.5 | 93 | | |
| 28 | 93 | | |
| 20 | 91 | | |
| 14 | 90 | | |
| 10 | 89 | | |
| 6.3 | 85 | | |
| 5.0 | 84 | | |
| 3.35 | 83 | | |
| 2.00 | 80 | | |
| 1.18 | 77 | Particle densit | v Ma/m2 |
| 0.600 | 74 | Faiticle derisit | y, wg/ms |
| 0.425 | 73 | 2.65 a | ssumed |
| 0.300 | 71 | Dry mass of a | omplo ka |
| 0.212 | 69 | Dry mass of sa | апріе, ку |
| 0.150 | 66 | E 0 | |
| 0.063 | 56 | 5.8 | |

| Soil description | Brown grey slightly gravelly slightly sandy SILT with low cobble content | | |
|---------------------------------------|--------------------------------------------------------------------------|-----------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: | as BS1377 | |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 7 | 0 |
| Proportions | Gravel | 13 | 14 |
| * 00 | Sand | 25 | 27 |
| *<60mm values to aid description only | Silt | 37 | 40 |
| accomption only | Clay | 18 | 19 |

| Uniformity Coefficient D ₆₀ / | D ₁₀ #N/A |
|------------------------------------------|-----------------------------|
|------------------------------------------|-----------------------------|

| | BS 1377 : Part 2 : 1990 | | |
|-------------|-------------------------|---------------|--|
| Test Method | Sieving | 9.2 wet sieve | |
| | Sedimentation | 9.4 pipette | |

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

PSD₆

Project No H8076

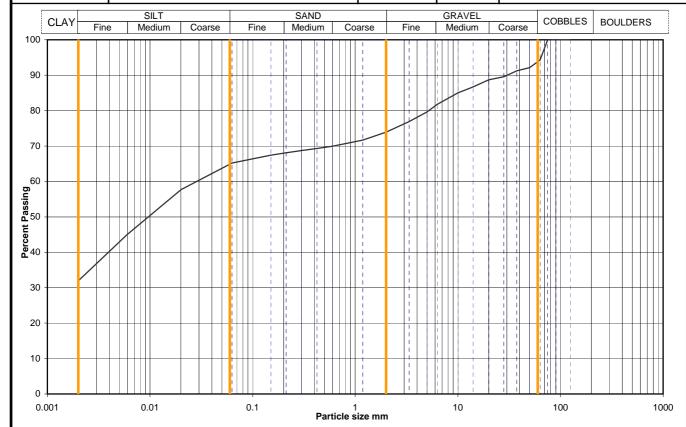
Project Name Hirwaun Industrial Estate

Sample Hole No BH107
Details: Depth (m BGL) 3.00

 Samp No
 6
 Type
 B

 ID
 ESGH80762008091600000000330

Spec Ref



| Sievin | Sieving | | ation |
|---------------|---------|-------------------------|-----------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 58 |
| 90 | 100 | 0.0060 | 45 |
| 75 | 100 | 0.0020 | 32 |
| 63 | 94 | | |
| 50 | 92 | | |
| 37.5 | 91 | | |
| 28 | 90 | | |
| 20 | 89 | | |
| 14 | 87 | | |
| 10 | 85 | | |
| 6.3 | 82 | | |
| 5.0 | 80 | | |
| 3.35 | 77 | | |
| 2.00 | 74 | | |
| 1.18 | 72 | Particle density | / Ma/m3 |
| 0.600 | 70 | Particle density, Mg/m3 | |
| 0.425 | 69 | 2.65 assumed | |
| 0.300 | 69 | Dry mass of sample, kg | |
| 0.212 | 68 | Diy illass 01 Se | ampie, ky |
| 0.150 | 67 | 8.5 | |
| 0.063 | 65 | 1 8.5 | |

| Soil description | Brown grey slightly gravelly slightly sandy CLAY with low cobble content | | |
|------------------------------------------|--------------------------------------------------------------------------|-------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: as BS1377 | | |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 6 | 0 |
| Proportions | Gravel | 20 | 21 |
| * 00 | Sand | 9 | 10 |
| *<60mm values to aid description only | Silt | 33 | 35 |
| accompliant only | Clay | 32 | 34 |

Uniformity Coefficient D₆₀ / D₁₀ #N/A

| | BS 1377 : Part 2 : 1990 | | | |
|-------------|-------------------------|-------------|--|--|
| Test Method | Sieving 9.2 wet sieve | | | |
| | Sedimentation | 9.4 pipette | | |

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QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Particle Size Distribution Analysis H8076 Project No Sample BH109 Hole No Details: Depth (m BGL) 1.20 Project Name Hirwaun Industrial Estate Samp No 3 Туре В ID ESGH8076200809160000000340 Spec Ref SILT Medium Coarse SAND GRAVEL CLAY COBBLES **BOULDERS** Fine Fine Coarse Fine Coarse Medium Medium 100 90 80 70 Percent Passing 30 20 10 0.001 0.01 0.1 1 Particle size mm 10 100 1000

| Sievin | Sieving | | ation |
|---------------|---------|------------------|-----------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 96 | | |
| 37.5 | 86 | | |
| 28 | 81 | | |
| 20 | 72 | | |
| 14 | 66 | | |
| 10 | 59 | | |
| 6.3 | 50 | | |
| 5.0 | 44 | | |
| 3.35 | 37 | | |
| 2.00 | 30 | | |
| 1.18 | 26 | | |
| 0.600 | 22 | | |
| 0.425 | 19 | | |
| 0.300 | 16 | Dry mass of sa | ample ka |
| 0.212 | 14 | Diy illass 01 Sa | ampie, ky |
| 0.150 | 12 | 11.4 | |
| 0.063 | 9 | 11.4 | |

| Soil description | Brown grey slightly clayey very sandy fine to coarse subangular GRAVEL with low cobble content | | |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------|-------|--------|
| Preparation / Pretreatment | Sieve: pre dried, | | |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 1 | 0 |
| Proportions | Gravel | 69 | 70 |
| * 00 | Sand | 21 | 21 |
| *<60mm values to aid description only Silt silt+clay = | | | |
| accompanion only | Clay | 9 | 9 |

Uniformity Coefficient D₆₀ / D₁₀ 113

| | BS 1377 : Part 2 : 1990 | | | |
|-------------|-------------------------|------|--|--|
| Test Method | Sieving 9.2 wet sieve | | | |
| | Sedimentation | none | | |

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Project No H8076

Hirwaun Industrial Estate

Project Name

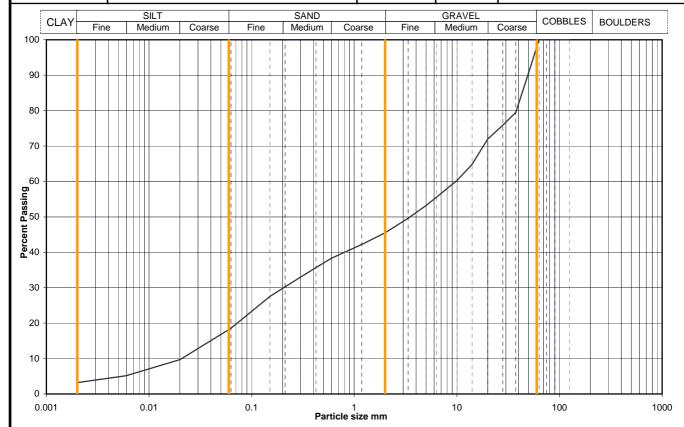
Sample Details:

Hole No TP11A
Depth (m BGL) 1.30

 Samp No
 9
 Type
 B

 ID
 ESGH8076200808270000000034

Spec Ref



| Sievin | Sieving | | ation |
|---------------|---------|-------------------------|--------------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 10 |
| 90 | 100 | 0.0060 | 5 |
| 75 | 100 | 0.0020 | 3 |
| 63 | 100 | | |
| 50 | 91 | | |
| 37.5 | 79 | | |
| 28 | 76 | | |
| 20 | 72 | | |
| 14 | 65 | | |
| 10 | 60 | | |
| 6.3 | 56 | | |
| 5.0 | 53 | | |
| 3.35 | 50 | | |
| 2.00 | 45 | | |
| 1.18 | 42 | Particle density | / Ma/m2 |
| 0.600 | 38 | raiticle delisit | y, ivig/iiio |
| 0.425 | 36 | 2.65 assumed | |
| 0.300 | 33 | Dr. mass of sample line | |
| 0.212 | 30 | Dry mass of sample, kg | |
| 0.150 | 28 | 18.0 | |
| 0.063 | 19 | | |

| Soil description | Brown grey silty very sandy GRAVEL with low cobble content | | |
|---------------------------------------|------------------------------------------------------------|-------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: as BS1377 | | |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 2 | 0 |
| Proportions | Gravel | 53 | 54 |
| * 00 | Sand | 27 | 28 |
| *<60mm values to aid description only | Silt | 15 | 15 |
| accompliant only | Clay | 3 | 3 |

Uniformity Coefficient D₆₀ / D₁₀ 468

| | BS 1377 : Part 2 : 1990 | | | |
|-------------|-------------------------|-------------|--|--|
| Test Method | Sieving 9.2 wet sieve | | | |
| | Sedimentation | 9.4 pipette | | |

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QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Project No H8076

Hirwaun Industrial Estate

Project Name

Sample Details:

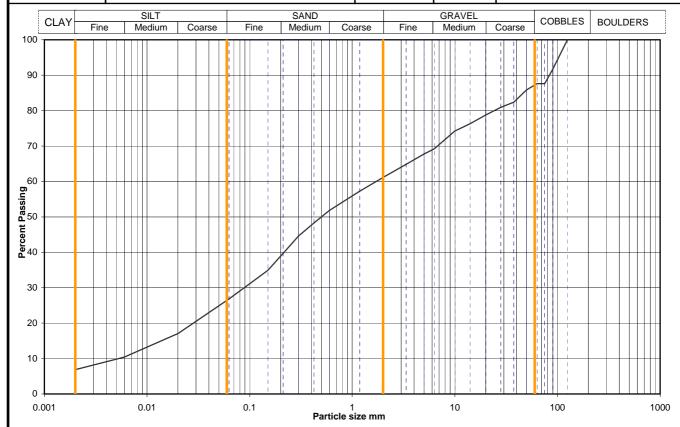
 Hole No
 TP3

 Depth (m BGL)
 1.20

 Samp No
 11
 Type
 B

ID ESGH8076200808270000000140

Spec Ref



| Sievin | Sieving | | ation |
|---------------|---------|------------------------|--------------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 17 |
| 90 | 92 | 0.0060 | 10 |
| 75 | 88 | 0.0020 | 7 |
| 63 | 88 | | |
| 50 | 86 | | |
| 37.5 | 82 | | |
| 28 | 81 | | |
| 20 | 79 | | |
| 14 | 76 | | |
| 10 | 74 | | |
| 6.3 | 69 | | |
| 5.0 | 68 | | |
| 3.35 | 65 | | |
| 2.00 | 61 | | |
| 1.18 | 57 | Particle density | / Ma/m3 |
| 0.600 | 52 | i article derisit | y, ivig/iiio |
| 0.425 | 48 | 2.65 assumed | |
| 0.300 | 45 | Dry mass of sample, kg | |
| 0.212 | 40 | | |
| 0.150 | 35 | 18.8 | |
| 0.063 | 27 | 18.8 | |

| Soil description | Brown very silty very gravelly SAND with medium cobble content | | |
|------------------------------------------|----------------------------------------------------------------|-----------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: | as BS1377 | , |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 13 | 0 |
| Proportions | Gravel | 26 | 30 |
| * 00 | Sand | 35 | 40 |
| *<60mm values to aid description only | Silt | 19 | 22 |
| accompact cray | Clay | 7 | 8 |

Uniformity Coefficient D₆₀ / D₁₀ 323

| | BS 1377 : Part 2 : 1990 | | | |
|-------------|-------------------------|-------------|--|--|
| Test Method | Sieving 9.2 wet sieve | | | |
| | Sedimentation | 9.4 pipette | | |

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Project No H8076

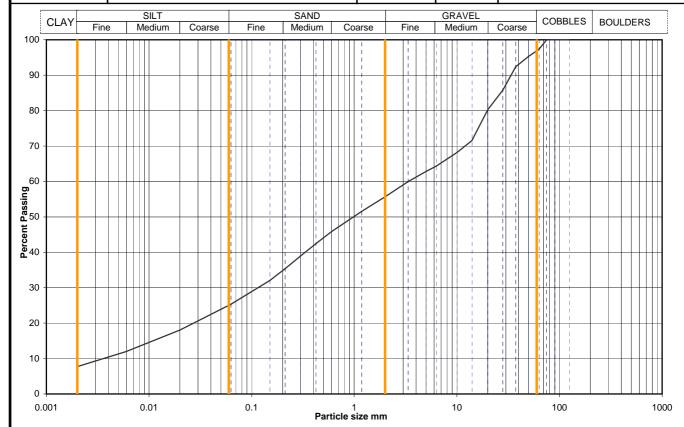
Project Name Hirwaun Industrial Estate

Sample Hole No TP5
Details: Depth (m BGL) 1.20

 Samp No
 13
 Type
 B

 ID
 ESGH80762008082700000000166

Spec Ref



| Sieving Sedin | | Sediment | ation |
|---------------|---------|-------------------------|---------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 18 |
| 90 | 100 | 0.0060 | 12 |
| 75 | 100 | 0.0020 | 8 |
| 63 | 97 | | |
| 50 | 95 | | |
| 37.5 | 92 | | |
| 28 | 86 | | |
| 20 | 80 | | |
| 14 | 72 | | |
| 10 | 68 | | |
| 6.3 | 64 | | |
| 5.0 | 63 | | |
| 3.35 | 60 | | |
| 2.00 | 56 | | |
| 1.18 | 52 | Dorticle density Ma/m2 | |
| 0.600 | 46 | Particle density, Mg/m3 | |
| 0.425 | 42 | 2.65 assumed | |
| 0.300 | 39 | Day makes of something | |
| 0.212 | 35 | Dry mass of sample, kg | |
| 0.150 | 32 | 12.0 | |
| 0.063 | 25 | 12.0 | |

| Soil description | Grey brown very silty very sandy GRAVEL with low cobble content | | |
|------------------------------------------|-----------------------------------------------------------------|-----------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: | as BS1377 | , |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 3 | 0 |
| Proportions | Gravel | 41 | 42 |
| | Sand | 31 | 32 |
| *<60mm values to aid description only | Silt | 17 | 18 |
| accompilation only | Clay | 8 | 8 |

Uniformity Coefficient D₆₀ / D₁₀ 940

| | BS 1377 : Part 2 : 1990 | | | |
|-------------|-------------------------|-------------|--|--|
| Test Method | Sieving 9.2 wet sieve | | | |
| | Sedimentation | 9.4 pipette | | |

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Project No H8076

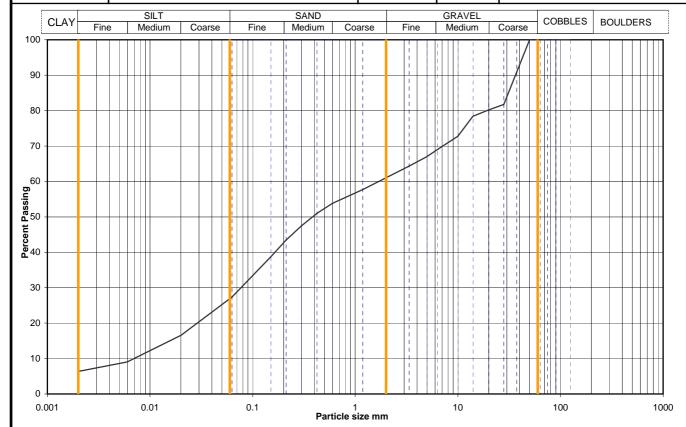
Project Name Hirwaun Industrial Estate

Sample Hole No TP7
Details: Depth (m BGL) 2.20

Samp No 10 Type D

ID ESGH8076200808270000000201

Spec Ref



| Sievin | Sieving Sedimentation | | ation |
|---------------|-----------------------|-------------------------|--------------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 17 |
| 90 | 100 | 0.0060 | 9 |
| 75 | 100 | 0.0020 | 6 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 91 | | |
| 28 | 82 | | |
| 20 | 80 | | |
| 14 | 78 | | |
| 10 | 73 | | |
| 6.3 | 69 | | |
| 5.0 | 67 | | |
| 3.35 | 64 | | |
| 2.00 | 61 | | |
| 1.18 | 58 | Particle density, Mg/m3 | |
| 0.600 | 54 | i article derisit | y, ivig/iiio |
| 0.425 | 51 | 2.65 as | ssumed |
| 0.300 | 48 | Dry mass of sa | ample ka |
| 0.212 | 43 | Diy illass 01 Se | ampie, kg |
| 0.150 | 39 | 1.5 | |
| 0.063 | 27 | 1.5 | |

| Soil description | Grey brown very silty very sandy GRAVEL | | |
|---------------------------------------|-----------------------------------------|-----------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: | as BS1377 | , |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 0 | 0 |
| Proportions | Gravel | 39 | 39 |
| * 00 | Sand | 34 | 34 |
| *<60mm values to aid description only | Silt | 21 | 21 |
| accompanion only | Clay | 6 | 6 |

Uniformity Coefficient D₆₀ / D₁₀ 242

 BS 1377 : Part 2 : 1990

 Test Method
 Sieving
 9.2 wet sieve

 Sedimentation
 9.4 pipette

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

Project No H8076

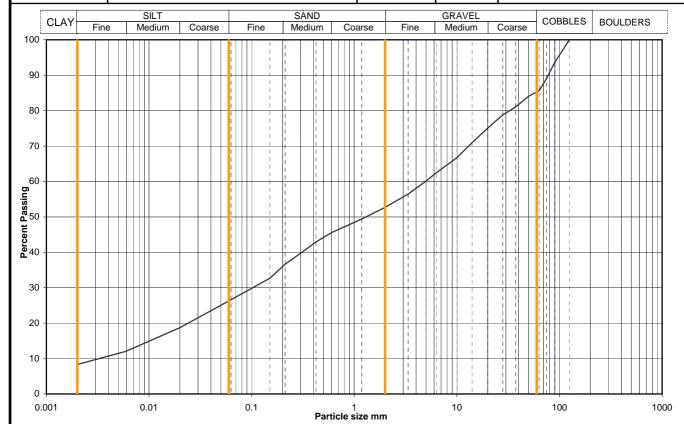
Project Name Hirwaun Industrial Estate

Sample Hole No TP8
Details: Depth (m BGL) 1.50

 Samp No
 13
 Type
 B

 ID
 ESGH8076200808270000000218

Spec Ref



| Sievin | Sieving | | ation |
|---------------|---------|-------------------------|-----------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 19 |
| 90 | 94 | 0.0060 | 12 |
| 75 | 89 | 0.0020 | 8 |
| 63 | 86 | | |
| 50 | 84 | | |
| 37.5 | 81 | | |
| 28 | 79 | | |
| 20 | 75 | | |
| 14 | 71 | | |
| 10 | 67 | | |
| 6.3 | 62 | | |
| 5.0 | 60 | | |
| 3.35 | 56 | | |
| 2.00 | 53 | | |
| 1.18 | 49 | Particle density, Mg/m3 | |
| 0.600 | 46 | i article derisit | y, wg/ms |
| 0.425 | 43 | 2.65 assumed | |
| 0.300 | 40 | Dry mass of sample, kg | |
| 0.212 | 37 | Dry mass or so | ampie, kg |
| 0.150 | 33 | 18.3 | |
| 0.063 | 27 | 7 18.3 | |

| Soil description | Brown very silty very sandy GRAVEL with medium cobble content | | |
|-------------------------------|---------------------------------------------------------------|-----------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: | as BS1377 | , |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 15 | 0 |
| Proportions | Gravel | 32 | 38 |
| *<60mm values to aid | Sand | 26 | 31 |
| description only | Silt | 18 | 21 |
| 2223 | Clay | 9 | 11 |

Uniformity Coefficient D₆₀ / D₁₀ 1508

| | BS 1377 : Par | t 2 : 1990 | | |
|-------------|-----------------------|-------------|--|--|
| Test Method | Sieving 9.2 wet sieve | | | |
| | Sedimentation | 9.4 pipette | | |

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

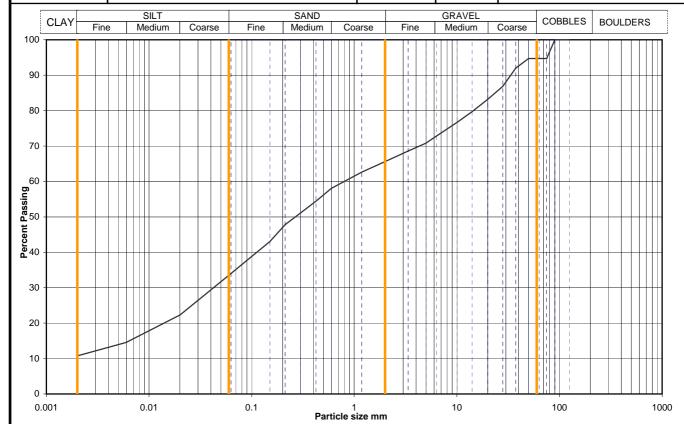
Project No H8076

Project Name Hirwaun Industrial Estate

Sample Hole No TP9
Details: Depth (m BGL) 0.70

Samp No 12 Type B
ID ESGH8076200808270000000227

Spec Ref



| Sievin | Sieving Sedimentation | | ation |
|---------------|-----------------------|-------------------------|-----------|
| Particle Size | % | Particle Size | % |
| mm | Passing | mm | Passing |
| 125 | 100 | 0.0201 | 22 |
| 90 | 100 | 0.0060 | 15 |
| 75 | 95 | 0.0020 | 11 |
| 63 | 95 | | |
| 50 | 95 | | |
| 37.5 | 92 | | |
| 28 | 87 | | |
| 20 | 83 | | |
| 14 | 80 | | |
| 10 | 77 | | |
| 6.3 | 73 | | |
| 5.0 | 71 | | |
| 3.35 | 69 | | |
| 2.00 | 66 | | |
| 1.18 | 63 | Particle density, Mg/m3 | |
| 0.600 | 58 | i article derisit | y, wg/ms |
| 0.425 | 54 | 2.65 a | ssumed |
| 0.300 | 51 | Dry mass of sa | ample ka |
| 0.212 | 48 | Diy iiiass oi se | ampie, ky |
| 0.150 | 43 | 11.6 | |
| 0.063 | 34 | 11.0 | |

| Soil description | Brown slightly gravelly slightly sandy SILT with low cobble content | | |
|------------------------------------------|---------------------------------------------------------------------|-----------|--------|
| Preparation / Pretreatment | Sieve: pre dried, Pipette: | as BS1377 | , |
| Remarks | | | |
| | | Whole | *<60mm |
| Sample | Cobbles / boulders | 5 | 0 |
| Proportions | Gravel | 29 | 31 |
| * 00 | Sand | 32 | 34 |
| *<60mm values to aid description only | Silt | 23 | 24 |
| accompliant only | Clay | 11 | 12 |

Uniformity Coefficient D₆₀ / D₁₀ #N/A

| | BS 1377 : Part 2 : 1990 | | | |
|-------------|-------------------------|-------------|--|--|
| Test Method | Sieving 9.2 wet sieve | | | |
| | Sedimentation | 9.4 pipette | | |

QA Ref SLR 2.9 Rev 78 Jan 08





Figure

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS WITHOUT MEASUREMENT OF PORE **PRESSURE - SUMMARY OF RESULTS** Project No Project Name H8076 Hirwaun Industrial Estate Sample At failure / end of stage Density type Depth (m) Soil Description Hole No. Remarks $\boldsymbol{c}_{\mathrm{u}}$ bulk dry strair 0 D from to Soft brown sandy CLAY BH103 U 31 UU Р 3.00 3.50 1.76 1.34 104.7 60 7.1 24 48 General notes: Tests carried out in accordance with BS1377: Part 7: 1990, clause 8 for single stage, clause 9 for multistage tests. Specimens nominally 2:1 height diameter ratio and tested at a rate of strain of 2%/minute, unless annotated otherwise. See individual test reports for further details. \acute{o}_3 Legend UU - single stage test (may be in sets of specimens) Mode of failure P plastic cell pressure UUM - multistage test on a single specimen \acute{o}_1 - \acute{o}_3 brittle c_{u} suffix R - remoulded or recompacted undrained shear strength compound QA Ref Table

Printed:27/10/2008 14:29

UUSUM 1

Soil Mechanics

SLR 2

Rev 63 Jul 07

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK - SUMMARY OF RESULTS Project No Project Name H8076 Hirwaun Industrial Estate Specimen Sample Uniaxial Compression³ Dimensions² Bulk Water Rock Content¹ Density² Time to Mode of Hole No. Load Remarks Depth (m) Height H/D UCS Type Rate failure failure No. type from to Mg/m³ % kN/min MPa Sample below required BH101R 16.71 SILTSTONE 178.0 1.1 42 AC 70.0 test size SANDSTON Sample below required BH105R 3 С MS 141.0 13.00 14.50 72.0 175.0 2.4 2.64 0.4 42 808 SANDSTON E BH108R 2 11.00 12.00 С 72.0 196.0 2.7 2.62 0.6 42 978 AC 168.0 sample taken at 11.34m

Notes: Test Specification: International Society for Rock Mechanics (ISRM), Rock Characterization Testing and Monitoring, Suggested Methods, 1981

1 ISRM p83 test 1, water content at 105 ± 3 °C, specimen as received at the laboratory

 ${\tt 2~ISRM~p83~clause~(vii), Caliper~method~used~for~determination~of~bulk~volume~and~derivation~of~bulk~density}\\$

3 ISRM p113 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials

above notes apply unless annotated otherwise in the remarks

Mode of failure :

S - Single shear

MS - multiple shear

AC - Axial cleavage

F - Fragmented

Ref RLR 2

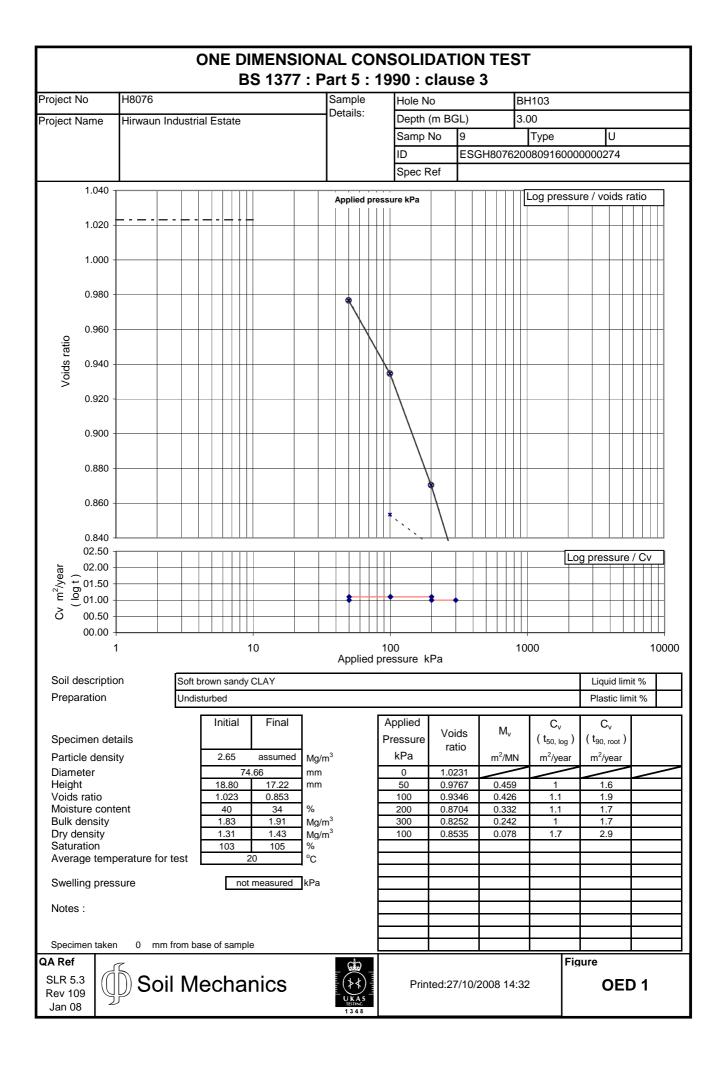
Rev 7 Jul 07

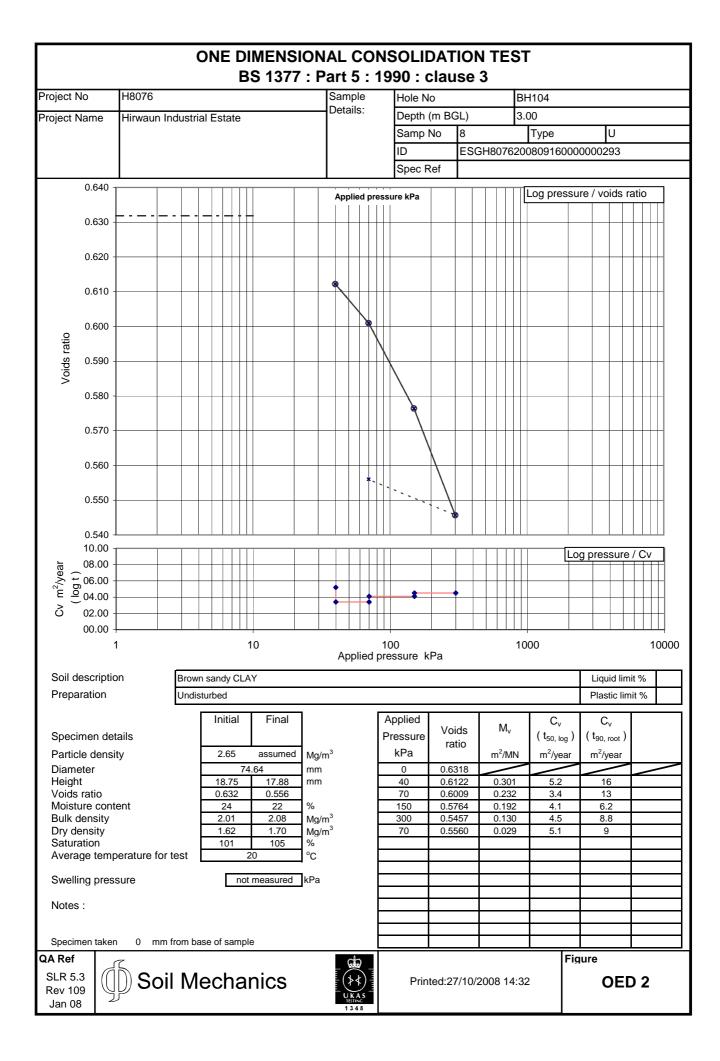


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Table

RUCS 1





CHEMICAL TESTS - SUMMARY OF RESULTS Project No **Project Name** H8076 Hirwaun Industrial Estate Sample рΗ Org LOI Sulphate as SO₄ CO_2 Chloride, Cl <2 water acid mm Depth (m) Hole No. Soil Description Remarks soil 2:1 wate sol. type No. from to g/L Grey brown slightly sandy silty fine to BH101 11 5.00 В 0.04 8.3 54 coarse subrounded GRAVEL Grey brown slightly sandy CLAY 11 4.50 4.70 7.6 0.03 99 Brown grey slightly sandy slightly BH103 0.06 97 gravelly CLAY Brown grey slightly gravelly CLAY 12 BH104 5.00 5.45 В 8.1 0.26 97 Brown grey slightly clayey slightly BH105 11 В 5.00 8.4 0.04 16 sandy fine to coarse subangular Brown grey slightly gravelly slightly BH106 6 2.00 В 4.9 0.03 80 sandy SILT with low cobble content Brown grey slightly gravelly slightly BH107 6 3.00 0.03 74 sandy CLAY with low cobble content Brown grey slightly clayey very sandy BH109 3 1.20 1.29 В 8.9 0.04 30 fine to coarse subangular GRAVEL Grey brown slightly sandy slightly 10 0.70 В 8.8 0.10 81 gravelly CLAY Grey brown slightly sandy slightly TP11 0.06 gravelly slightly organic CLAY Brown grey gravelly clayey SAND TP11A D 6 1.30 5.8 0.07 100 Brown grey sandy gravelly CLAY TP12A D 6 1.50 5.2 0.04 77 Brown slightly sandy slightly gravelly 7 1.30 D 5.3 0.05 84 Grey brown slightly sandy slightly TP2 10 1.70 72 gravelly CLAY Grey brown slightly sandy slightly TP3 6 0.50 D 7.9 0.02 86 gravelly CLAY Grey brown slightly sandy slightly TP5 D 8 1.20 7.9 0.05 81 gravelly SILT Grey brown slightly sandy slightly TP5 9 D 77 2.00 6.6 0.06 gravelly CLAY Brown grey sandy gravelly SILT TP6 10 1.60 D 5.5 0.05 78 Grey brown slightly sandy slightly TP7 8 D 0.70 8.0 0.06 75 gravelly CLAY Grey brown slightly sandy slightly 8 D 7.3 0.06 87 0.80 gravelly CLAY Brown grey slightly sandy gravelly TP9 9 72 CLAY General notes: BS 1377:Part 3:1990 definitive method used in all cases unless annotated otherwise. See individual test reports for further details Kev: 2:1 water:soil extract from soil Organic matter content CO_2 Carbonate content (rapid titration) < 2 mm material passing 2mm sieve Mass loss on ignition QA Ref

Soil Mechanics

SLR 3

Rev 64 Jul 07

Table

Printed:27/10/2008 14:28

CHEM 1

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP BS1377: PART 4: 1990: LIGHT COMPACTION, 2.5 kg rammer Sample Project No TP12A Hole No Details: Depth (m BGL) 0.20 Project Name Hirwaun Industrial Estate Samp No Туре ESGH8076200808270000000046 Spec Ref zero, 5% and 10% air voids 2.2 2.1 2.0 1.9 DENSITY Mg/m3 DRY 1.7 1.6 1.5 1.4 8 12 16 20 24 28 32 MOISTURE CONTENT % Soil description Derived Parameters + Brown grey slightly sandy gravelly CLAY Test method BS 1377:part 4:1990: clause 3.4, 2.5 kg rammer in a CBR mould Maximum dry density, Mg/m3 Preparation Original material was natural, single sample tested 1.98 Material > 37.5mm 16 Material < 37.5mm > 20mm 11 Optimum moisture content, % Particle density, Mg/m³ 2.65 assumed 11 X' Material tested at clients request Remarks QA Ref Figure Soil Mechanics SLD 4, 3.3/4 **COMPL 1** Printed:27/10/2008 14:32 Rev 62 Jul 07

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP BS1377: PART 4: 1990: LIGHT COMPACTION, 2.5 kg rammer Sample Project No TP15 Hole No Details: Depth (m BGL) 0.30 Project Name Hirwaun Industrial Estate Samp No Туре ESGH8076200808270000000067 Spec Ref zero, 5% and 10% air voids 2.2 2.1 2.0 1.9 DENSITY Mg/m3 DRY 1.7 1.6 1.5 1.4 8 12 16 20 24 28 32 MOISTURE CONTENT % Soil description Derived Parameters + Grey brown slightly sandy gravelly CLAY Test method BS 1377:part 4:1990: clause 3.4, 2.5 kg rammer in a CBR mould Maximum dry density, Mg/m3 Preparation Original material was natural, single sample tested 1.93 Material > 37.5mm 13 Material < 37.5mm > 20mm 13 Optimum moisture content, % Particle density, Mg/m³ 2.65 assumed 13 Remarks X' Material tested at clients request QA Ref Figure Soil Mechanics SLD 4, 3.3/4 COMPL 2 Printed:27/10/2008 14:32 Rev 62 Jul 07

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP BS1377: PART 4: 1990: HEAVY COMPACTION, 4.5 kg rammer Sample Project No Hole No Details: Depth (m BGL) 0.50 Project Name Hirwaun Industrial Estate Samp No Туре ESGH8076200808270000000137 Spec Ref zero, 5% and 10% air voids 2.2 2.1 2.0 1.9 DRY DENSITY Mg/m3 1.7 1.6 1.5 1.4 10 12 14 16 0 MOISTURE CONTENT % Soil description Derived Parameters + Grey brown slightly sandy slightly gravelly CLAY Test method BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould Maximum dry density, Mg/m3 Preparation Original material was natural, single sample tested 2.11 Material > 37.5mm 5 Material < 37.5mm > 20mm 4 Optimum moisture content, % Particle density 2.65 assumed 8.7 Remarks QA Ref Figure Soil Mechanics SLD 4, 3.5/6 COMPH 1 Printed:27/10/2008 14:31 Rev 62 Jul 07

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP BS1377: PART 4: 1990: HEAVY COMPACTION, 4.5 kg rammer Sample Project No Hole No Details: Depth (m BGL) 0.90 Project Name Hirwaun Industrial Estate Samp No Туре ESGH8076200808270000000180 Spec Ref zero, 5% and 10% air voids 2.2 2.1 2.0 1.9 DRY DENSITY Mg/m3 1.7 1.6 1.5 1.4 10 12 14 16 0 MOISTURE CONTENT % Soil description Derived Parameters + Brown grey gravelly sandy CLAY Test method BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould Maximum dry density, Mg/m3 Preparation Original material was natural, single sample tested 2.08 Material > 37.5mm 18 Material < 37.5mm > 20mm Optimum moisture content, % Particle density 2.65 assumed 8.2 Remarks X' Material tested at clients request Figure QA Ref SLD 4, 3.5/6 Soil Mechanics **COMPH 2** Printed:27/10/2008 14:31 Rev 62 Jul 07



ENCLOSURE D GEOENVIRONMENTAL LABORATORY TEST RESULTS

TES Report

TES Report no EFS/086407M (ver2) EFS/086384M EFS/086382M EFS/085713M EXR/088900



TEST REPORT SOIL SAMPLE ANALYSIS





Amended Report TES Report No. EFS/086407M (Ver. 2)

Soil Mechanics Unit 15 Crosby Yard Bridgend Mid Glamorgan CF31 1JZ

Site: Hirwaun Industrial Estate

The 16 samples described in this report were logged for analysis by TES Bretby on 06-Oct-2008. This is an amended report that replaces the report issued on 22-Oct-2008

The analysis was completed by: 05-Nov-2008

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by TES Bretby Laboratories.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of PCB Congener (12) Results (Page 5)
Table of TPH Texas banding (std) (Page 6)
GC-FID Chromatograms (Pages 7 to 22)
Table of Report Notes (Page 23)

On behalf of TES Bretby : Jane Colbourne

Project Co-ordinator

Date of Issue: 05-Nov-2008

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS) Tests marked 'A' have been subcontracted to another laboratory.

(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.

All results are reported on a dry weight basis at 105°C unless otherwise stated. (except QC samples) TES Bretby accepts no responsibility for any sampling not carried out by our personnel.

Sample Descriptions

Client: Soil Mechanics

Site: Hirwaun Industrial Estate

Report Number: S08_6407M

| Lab ID Number | Client ID | Description |
|---------------|----------------|-------------------|
| CL/0829481 | TP1A ES 1 0.30 | Brown Gravel SILT |
| CL/0829482 | TP1A ES 3 1.50 | Brown SILT |
| CL/0829483 | TP2 ES 1 0.30 | Brown SILT |
| CL/0829484 | TP2 ES 5 2.70 | Brown SILT |
| CL/0829485 | TP2 ES 6 3.30 | Brown CLAY |
| CL/0829486 | TP3 ES 2 0.50 | Brown Gravel SILT |
| CL/0829487 | TP4 ES 2 0.70 | Brown SILT |
| CL/0829488 | TP5 ES 1 0.30 | Brown SILT |
| CL/0829489 | TP6 ES 1 0.30 | Brown Gravel CLAY |
| CL/0829490 | TP7 ES 1 0.30 | Brown Gravel SILT |
| CL/0829491 | TP8 ES 1 0.30 | Brown Gravel CLAY |
| CL/0829492 | TP8 ES 3 0.80 | Brown Gravel SILT |
| CL/0829493 | TP9 ES 2 0.70 | Brown SILT |
| CL/0829494 | TP10 ES 1 0.30 | Brown SILT |
| CL/0829495 | TP10 ES 2 0.70 | Brown SILT |
| CL/0829496 | TP11 ES 2 1.60 | Brown SILT |
| | | |
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TES Bretby EFS/086407M Ver. 2

| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % | mg/kg | mg/kg |
|-------------------|---------------------------------------------------------------------------------------|-------------------|----------------|---------------|---------------------|---------------|---------------|-------------|---------------|--------------|----------------------|---------------|---------------|----------------|---------------------|-------------------|---------------------|
| | Method Codes : Method Reporting Limits : | ELESULP 20 | ICPACIDS 20 | ICPMSS 0.1 | ICPMSS 2 | ICPMSS 0.1 | ICPMSS 3 | ICPMSS 3 | ICPMSS 3.5 | 0.10 | ICPMSS 0.5 | ICPMSS 2.5 | ICPMSS 0.5 | ICPMSS 19.5 | TMSS 0.2 | TPHFIDUS 10.0 | TPHFIDUS 10.0 |
| | Accreditation Code: | UM | UM | U | UM | U | UM | UM | UM | U. 10 | U.S | UM | U | UM | U.Z | UM | 10.0 |
| TES ID Number CL/ | Client Sample Description | Elemental Sulphur | SO4 (acid sol) | Antimony (MS) | Arsenic (MS) | Cadmium (MS) | Chromium (MS) | Copper (MS) | Lead (MS) | Mercury (MS) | Molybdenum (MS) | Nickel (MS) | Selenium (MS) | Zinc (MS) | Tot.Moisture @ 105C | TPH by GCFID (AR) | TPH Carbon Banding. |
| 0829481 | TP1A ES 1 0.30 | <20 | 72 | <0.5 | 6.7 | 0.22 | 11.6‡ | 13 | 18.9 | <0.1 | <0.5 | 18.5 | <0.5 | 47.8 | 10.5 | 25 | Req |
| 0829482 | TP1A ES 3 1.50 | <20 | 55 | <0.5 | 5.8 | 0.19 | 10.6‡ | 11.4 | 14.9 | <0.1 | <0.5 | 18.2 | <0.5 | 42 | 10.6 | 34 | Req |
| 0829483 | TP2 ES 1 0.30 | <20 | <20 | <0.5 | 5.1 | 0.17 | 7.8‡ | 9.7 | 11.9 | <0.1 | <0.5 | 12.1 | <0.5 | 30.9 | 7.3 | 1000 | Req |
| 0829484 | TP2 ES 5 2.70 | 968 | 690 | 1.7 | 17.9 | 0.42 | 14‡ | 14.1 | 30.3 | 0.12 | 1.4 | 12.4 | 0.7 | 203.1 | 30.8 | 611 | Req |
| 0829485 | TP2 ES 6 3.30 | 36 | 318 | <0.5 | 6.4 | <0.1 | 19.6‡ | 4.9 | 25.6 | 0.12 | <0.5 | 8.6 | 0.9 | 58.8 | 45.5 | 222 | Req |
| 0829486 | TP3 ES 2 0.50 | <20 | <20 | <0.5 | 6.1 | 0.2 | 11.3‡ | 19.4 | 13.4 | <0.1 | <0.5 | 18 | <0.5 | 41.5 | 9.5 | <11.0 | Req |
| 0829487 | TP4 ES 2 0.70 | <20 | <20 | <0.5 | 4.9 | 0.19 | 7.7‡ | 24.8 | 9.5 | <0.1 | <0.5 | 12.6 | <0.5 | 66.2 | 9.6 | 44 | Req |
| 0829488 | TP5 ES 1 0.30 | <20 | <20 | <0.5 | 6.3 | 0.19 | 11.0‡ | 15.1 | 15.9 | <0.1 | <0.5 | 17.1 | <0.5 | 47.5 | 10.2 | 15.6 | Req |
| 0829489 | TP6 ES 1 0.30 | <21 | <21 | <0.5 | 7 | 0.22 | 11.1‡ | 12.8 | 14.1 | <0.1 | 0.5 | 18 | <0.5 | 52.6 | 15.5 | 33 | Req |
| 0829490 | TP7 ES 1 0.30 | <20 | <20 | <0.5 | 6.4 | 0.22 | 10.8‡ | 13.5 | 15.7 | <0.1 | <0.5 | 17.6 | <0.5 | 39.3 | 11.2 | 23 | Req |
| 0829491 | TP8 ES 1 0.30 | <21 | <21 | <0.5 | 7.1 | 0.27 | 10.2‡ | 28.3 | 15 | <0.1 | <0.5 | 18.8 | <0.5 | 72.1 | 14.1 | <11.6 | Req |
| 0829492 | TP8 ES 3 0.80 | <20 | <20 | <0.5 | 7.7 | 0.18 | 10.7‡ | 12.7 | 15.1 | <0.1 | <0.5 | 13.3 | <0.5 | 56.4 | 11.3 | 19 | Req |
| 0829493 | TP9 ES 2 0.70 | <21 | <21 | <0.5 | 5.3 | 0.14 | 9.9‡ | 10.5 | 11.7 | <0.1 | <0.5 | 13.5 | <0.5 | 30.1 | 10.7 | <11.2 | Req |
| 0829494 | TP10 ES 1 0.30 | <20 | <20 | 1 | 6.4 | 0.21 | 9.4‡ | 14.7 | 29.2 | <0.1 | <0.5 | 15.3 | <0.5 | 56.6 | 11.3 | 13.5 | Req |
| 0829495 | TP10 ES 2 0.70 | 13 | 495 | 1.4 | 7.8 | 2.01 | 14.9‡ | 187.2 | 52.1 | 0.22 | 1.1 | 18.6 | <0.5 | 1220 | 11.4 | 444 | Req |
| 0829496 | TP11 ES 2 1.60 | 22 | 470 | 0.6 | 27.8 | 0.77 | 18.4‡ | 14 | 39.2 | <0.1 | 1.2 | 10.7 | 1.1 | 148 | 31.1 | 118 | Req |
| | TES Bretby PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD | Client N | | Soil Me | echanics odroffe | | | | | | S Date Prir | Am | ample A | | S 05-Nov-08 | | S |
| | Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | | | Hirw | aun lı | ndust | rial E | state | | | Report N Table Nu | | | EF: | S/086407M 1 | Bre | etby |

| | Units : | pH Units | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | ug/kg | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % M/M | | |
|-------------------|----------------------------------------------------------------------------------------------------|----------|---------------------|----------|-----------|--------------|-----------------|--------------------|----------------------|--------------------|---------------------|-------------------|----------------------|--------------------|------------------------|----|-----|
| | Method Codes : | WSLM3 | ICPBOR | ICPMAJ | KONECL | KONECR | PAHSCUV | PCBUSECD | SEN9 | SFAPI | SFAPI | SFAPI | SFAPI | SFAS | WSLM59 | | |
| | Method Reporting Limits : Accreditation Code: | U | 0.5 N | 1 N | 5.0 N | 0.1 N | 10 N | | N | 0.5 N | 0.5 N | 0.5 N | 2 N | 0.5 N | 0.02 N | | |
| TES ID Number CL/ | Client Sample Description | pH units | Boron (H20 Soluble) | Barium | Chloride: | Chromium vi: | PAH (screening) | PCB (12 Congeners) | Asbestos (screening) | Cyanide(Free) (AR) | Cyanide(Total) (AR) | Phenol Index.(AR) | Thiocyanate(SCN)(AR) | Sulphide as S (AR) | F.O.C. % | | |
| 0829481 | TP1A ES 1 0.30 | 7.9 | 3.4 | 115 | 10.1 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 1.15 | | |
| 0829482 | TP1A ES 3 1.50 | 8.0 | 3.2 | 120 | 9.2 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.76 | | |
| 0829483 | TP2 ES 1 0.30 | 7.3 | 3.1 | 38 | 21 | <0.1 | <10 | | NBFO | <0.5 | <0.5 | <0.5 | <2.2 | <0.5 | 0.38 | | |
| 0829484 | TP2 ES 5 2.70 | 9.0 | 4.1 | 104 | 96 | <0.1 | 227 | | NBFO | <0.7 | <0.7 | <0.7 | <2.9 | 15.6 | 2.9 | | |
| 0829485 | TP2 ES 6 3.30 | 7.1 | 3.8 | 116 | 70 | <0.1 | <11 | | NBFO | <0.9 | <0.9 | <0.9 | <3.7 | 1.5 | 5.08 | | |
| 0829486 | TP3 ES 2 0.50 | 8.0 | 3 | 142 | 47 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.58 | | |
| 0829487 | TP4 ES 2 0.70 | 8.4 | 3.1 | 106 | 15.4 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.56 | | |
| 0829488 | TP5 ES 1 0.30 | 8.2 | 3 | 123 | 13.3 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.57 | | |
| 0829489 | TP6 ES 1 0.30 | 8.2 | 2.9 | 112 | 26 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.63 | | |
| 0829490 | TP7 ES 1 0.30 | 8.3 | 2.7 | 190 | 50 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.55 | | |
| 0829491 | TP8 ES 1 0.30 | 8.2 | 2.7 | 104 | 7.2 | <0.1 | <10 | Req | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.51 | | |
| 0829492 | TP8 ES 3 0.80 | 7.8 | 2.8 | 96 | 21 | <0.1 | <10 | Req | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.54 | | |
| 0829493 | TP9 ES 2 0.70 | 6.8 | 2.9 | 30 | 15.4 | <0.1 | <10 | Req | NBFO | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.29 | | |
| 0829494 | TP10 ES 1 0.30 | 7.9 | 2.6 | 78 | 12.2 | <0.1 | <10 | | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.73 | | |
| 0829495 | TP10 ES 2 0.70 | 8.3 | 3 | 419 | 28 | <0.1 | 36 | | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 2.31 | | |
| 0829496 | TP11 ES 2 1.60 | 6.6 | 3.4 | 153 | 12.5 | <0.1 | <10 | | NBFO | <0.7 | <0.7 | <0.7 | <2.9 | <0.7 | 3.24 | | |
| | | | | | | | | | | | | | | | | | |
| | TES Bretby | Client N | | | chanics | | | | | | | | ample A | - | is | TF | ES |
| | PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 | Contact | | Mr H Woo | | nduc | trial E | ctata | | | Date Pri | nted | nended Rep | | 05-Nov-08 S/086407M | | tby |
| | Fax +44 (0) 1283 554422 | | | ПIГW | aun II | nausi | ırıaı E | state | | | Table Nu | ımber | | | 1 | | |

| | Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | | | Hirw | aun lı | ndustria | Estate | • | Report Table N | Number umber | | EFS/086407M 1 | Bre | etby |
|---------------|----------------------------------------------------------------------------|--------------|------------------|------------------|---------|----------|--------|---|-------------------|-----------------|------------|-------------------|-----|------|
| | PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD | Contact | | Mr H Woo | odroffe | | | | Date Pr | | nended Rep | port 05-Nov-08 | | |
| | TES Bretby | Client N | | | chanics | | | | | | _ | Analysis | TF | ES I |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 0829496 | TP11 ES 2 1.60 | <15 | <15 | <15 | <29 | | | | | | | | | |
| 0829495 | TP10 ES 2 0.70 | <11 | <11 | <11 | <23 | | | | | | | | | |
| 0829494 | TP10 ES 1 0.30 | <11 | <11 | <11 | <23 | | | | | | | | | |
| 0829493 | TP9 ES 2 0.70 | <11 | <11 | <11 | <22 | | | | | | | | | |
| 0829492 | TP8 ES 3 0.80 | <11 | <11 | <11 | <23 | | | | | | | | | |
| 0829491 | TP8 ES 1 0.30 | <12 | <12 | <12 | <23 | | | | | | | | | |
| 0829490 | TP7 ES 1 0.30 | <11 | <11 | <11 | <23 | | | | | | | | | |
| 0829489 | TP6 ES 1 0.30 | <12 | <12 | <12 | <24 | | | | | | | | | |
| 0829488 | TP5 ES 1 0.30 | <11 | <11 | <11 | <22 | | | | | | | | | |
| 0829487 | TP4 ES 2 0.70 | <11 | <11 | <11 | <22 | | | | | | | | | |
| 0829486 | TP3 ES 2 0.50 | <11 | <11 | <11 | <22 | | | | | | | | | |
| 0829485 | TP2 ES 6 3.30 | <18 | <18 | <18 | <37 | | | | | | | | | |
| 0829484 | TP2 ES 5 2.70 | <14 | <14 | <14 | <29 | | | | | | | | | |
| 0829483 | TP2 ES 1 0.30 | <11 | <11 | <11 | <22 | | | | | | | | | |
| 0829482 | TP1A ES 3 1.50 | <11 | <11 | <11 | <22 | | | | | | | | | |
| 0829481 | TP1A ES 1 0.30 | <11 | <11 | <11 | <22 | | | | | | | | | |
| mber CL/ | Green dample best priori | <u>z</u> ene | ene | enzene | nes | | | | | | | | | |
| TES ID Number | Client Sample Description | Benzene | Toluene | Ethyl Benzene | Xylenes | | | | | | | | | |
| | Accreditation Code: | N | N | N | N | | | | | | | | | |
| | Method Reporting Limits: | 10 | 10 | 10 | 20 | | | | | | | | | |
| | Units : Method Codes : | ug/kg | ug/kg BTEXHSA | ug/kg BTEXHSA | ug/kg | | | | | | | | | |

Polychlorinated Biphenyls (congeners)

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

 Job Number:
 \$08_6407M

 QC Batch Number:
 083657

Directory: 1016PCB.GC11 **Method:** Ultrasonic

Accreditation code:

| Accreditation code. | IN | | | | | | | | | | | | |
|---------------------|---------------|--------|--------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|
| | | | | | | Conce | ntration, | (µg/kg) | | | | | |
| Sample ID | Customer ID | PCB 81 | PCB 77 | PCB 123 | PCB 118 | PCB 114 | PCB 105 | PCB 126 | PCB 167 | PCB 156 | PCB 157 | PCB 169 | PCB 189 |
| * CL0829491 | TP8 ES 1 0.30 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 |
| * CL0829492 | TP8 ES 3 0.80 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| * CL0829493 | TP9 ES 2 0.70 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 | <5.1 |
| | | | | | | | | | | | | | |
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Soil

06-Oct-08

17-Oct-08

20-Oct-08

Matrix:

Date Booked in:

Date Extracted:

Date Analysed:

Total Petroleum Hydrocarbons (TPH) Carbon Ranges

Customer and Site Details: Soil Mechanics : Hirwaun Industrial Estate

Job Number: \$08_6407M QC Batch Number: 83558

Directory: D:\TES\DATA\Y2008\1010TPH_GC7\074B2801.D

Method: Ultra Sonic

Accreditation code: U

| | | | Concentra | ation, (mg/kg) - as o | dry weight. | |
|-----------|----------------|-----------|------------|-----------------------|-------------|------------|
| Sample ID | Client ID | >C8 - C10 | >C10 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 |
| CL0829481 | TP1A ES 1 0.30 | <2 | <2 | <2 | <2 | 15 |
| CL0829482 | TP1A ES 3 1.50 | <2 | <2 | 2.37 | 2.86 | 21.5 |
| CL0829483 | TP2 ES 1 0.30 | <2 | <2 | 17.6 | 148 | 727 |
| CL0829484 | TP2 ES 5 2.70 | 4.73 | 29.9 | 198 | 223 | 136.7 |
| CL0829485 | TP2 ES 6 3.30 | <4 | <4 | <4 | 4.17 | 141.1 |
| CL0829486 | TP3 ES 2 0.50 | <2 | <2 | <2 | <2 | <4.84 |
| CL0829487 | TP4 ES 2 0.70 | <2 | <2 | 2.75 | 8.76 | 25.8 |
| CL0829488 | TP5 ES 1 0.30 | <2 | <2 | <2 | <2 | 10.5 |
| CL0829489 | TP6 ES 1 0.30 | <2 | <2 | 4.18 | 3.57 | 17 |
| CL0829490 | TP7 ES 1 0.30 | <2 | <2 | <2 | <2 | 14 |
| CL0829491 | TP8 ES 1 0.30 | <2 | <2 | <2 | <2 | 5.8 |
| CL0829492 | TP8 ES 3 0.80 | <2 | <2 | <2 | <2 | 13 |
| CL0829493 | TP9 ES 2 0.70 | <2 | <2 | <2 | <2 | <4.90 |
| CL0829494 | TP10 ES 1 0.30 | <2 | <2 | <2 | <2 | 8.62 |
| CL0829495 | TP10 ES 2 0.70 | <2 | <2 | 5.79 | 68 | 314 |
| CL0829496 | TP11 ES 2 1.60 | <3 | <3 | 2.98 | 15.7 | 79.5 |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Soil

06-Oct-08

09-Oct-08

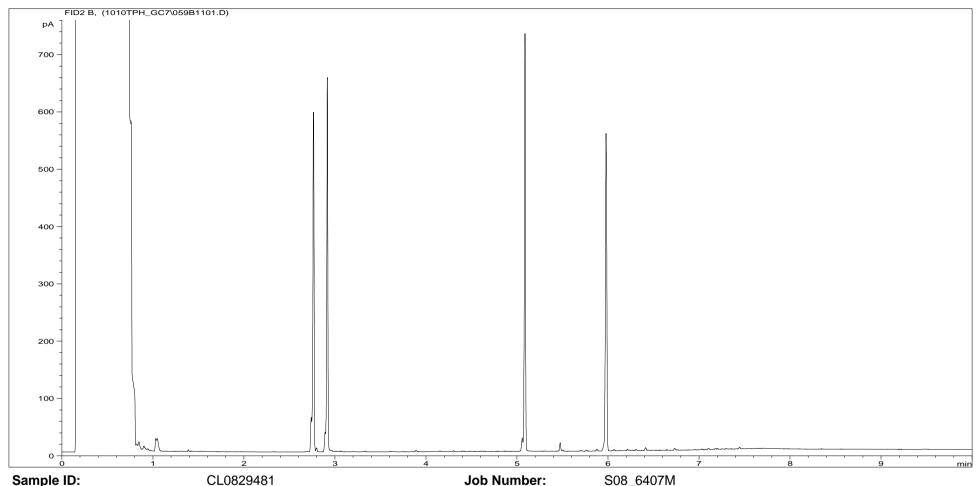
10-Oct-08

Matrix:

Date Booked in:

Date Extracted:

Date Analysed:



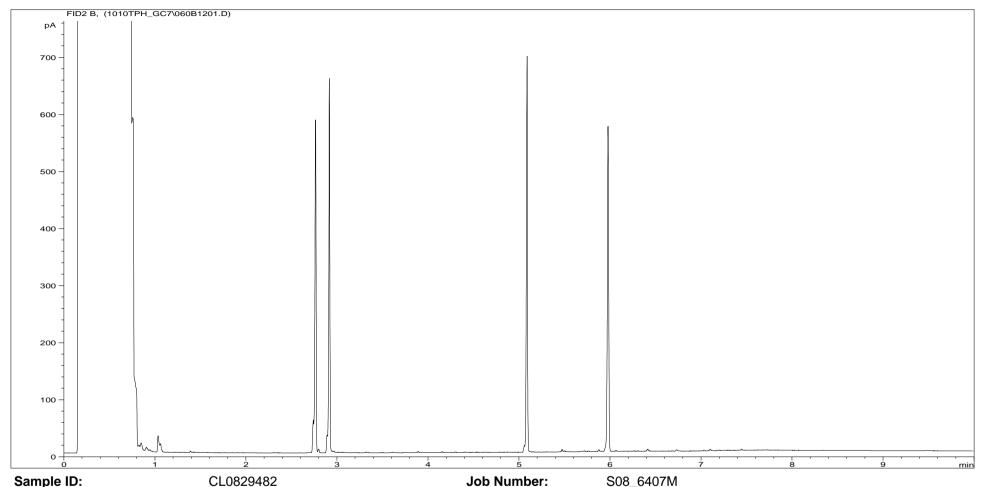
Sample ID: CL Multiplier: 8 Dilution: 1

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP1A ES 1 0.30

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\059B1101.D



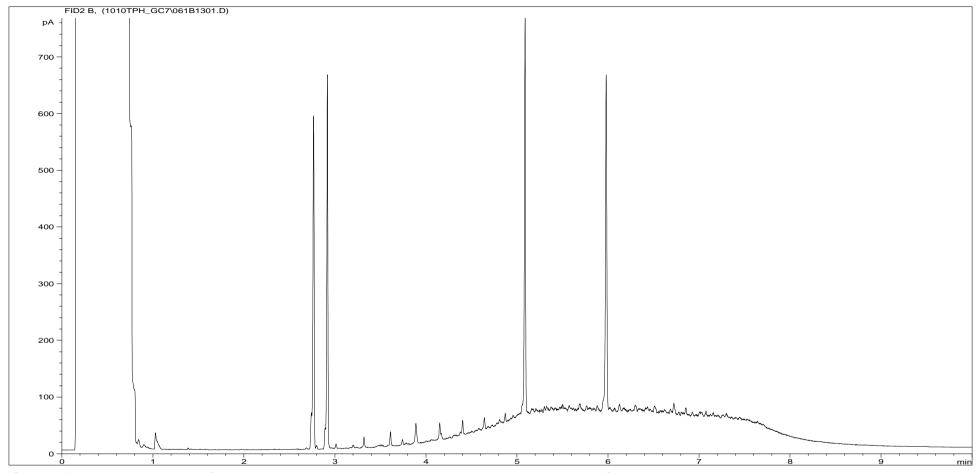
Sample ID: CL08
Multiplier: 8
Dilution: 1

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP1A ES 3 1.50

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\060B1201.D



Sample ID: CL0829483
Multiplier: 8

Job Number: S08_6407M
Client: Soil Mechanics

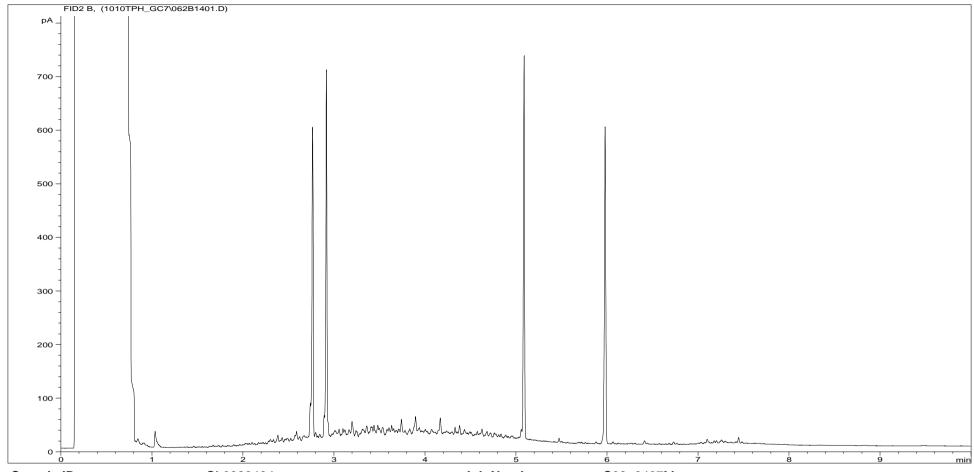
Dilution: 1
Acquisition Method: 5UL RUNENORACE M

Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP2 ES 1 0.30

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\061B1301.D



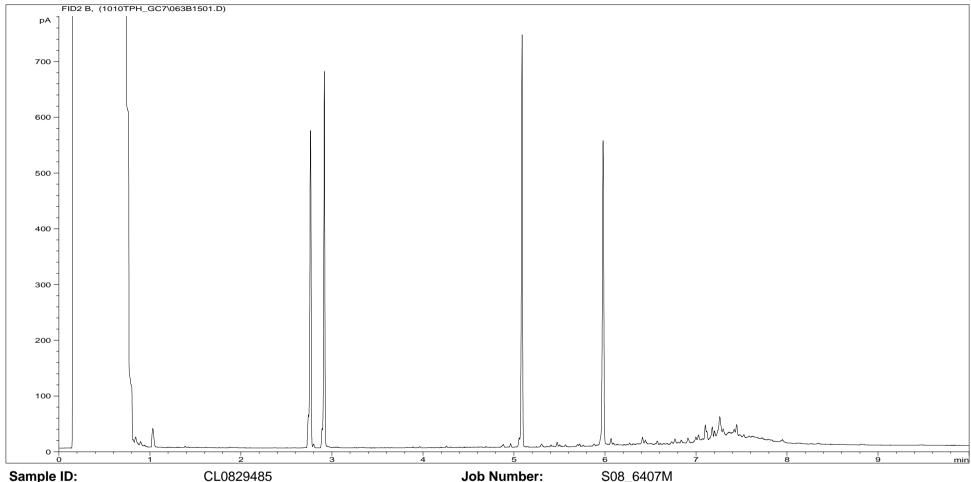
Sample ID:CL0829484Job Number:S08_6407MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP2 ES 5 2.70

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\062B1401.D



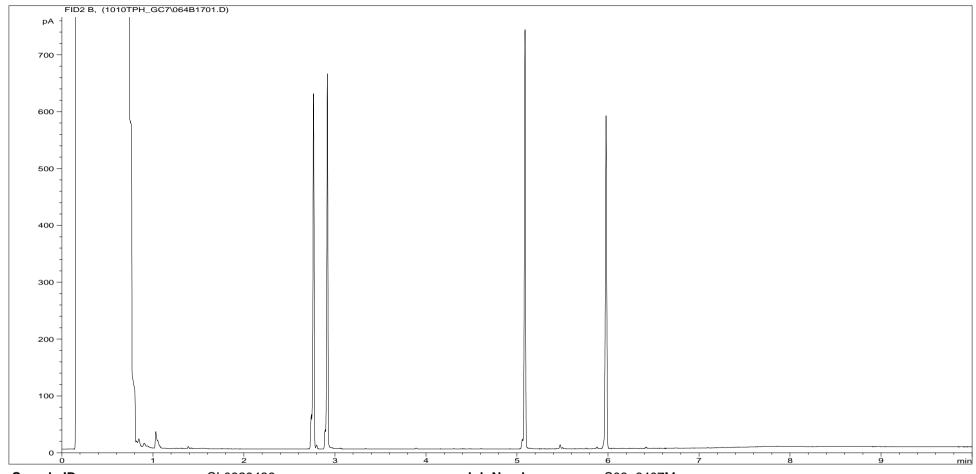
Sample ID: Multiplier: 8 Dilution:

Client: Site:

Hirwaun Industrial Estate **Acquisition Method:** 5UL_RUNFNORACE.M Client Sample Ref: TP2 ES 6 3.30

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\063B1501.D Soil Mechanics



Sample ID: CL0829486 Multiplier: 8 Dilution:

Job Number: S08 6407M Client: Soil Mechanics Site:

Acquisition Method: 5UL_RUNFNORACE.M

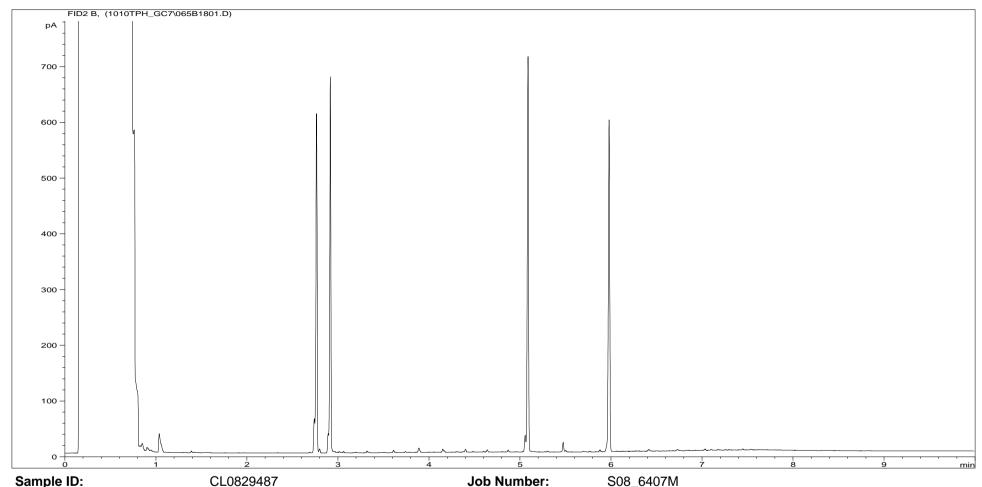
Hirwaun Industrial Estate Client Sample Ref:

TP3 ES 2 0.50

Acquisition Date/Time: 10-Oct-08

D:\TES\DATA\Y2008\1010TPH_GC7\064B1701.D

Datafile:



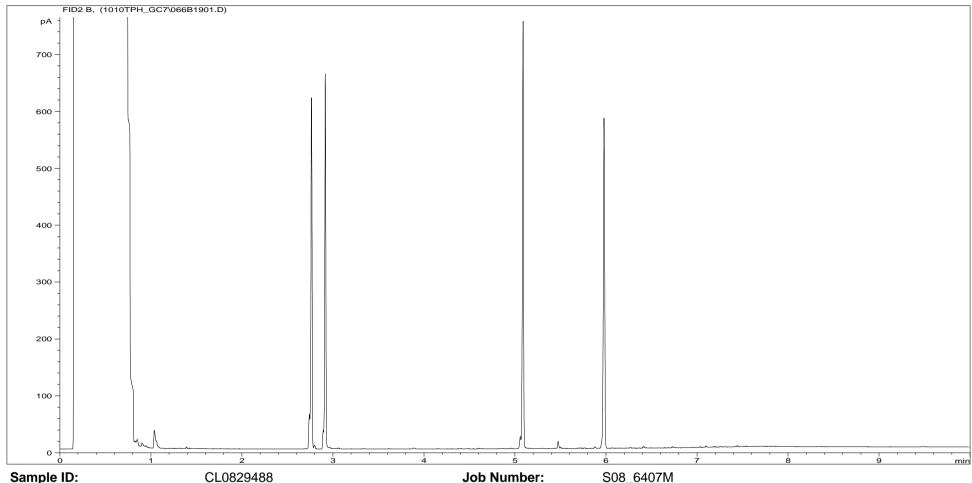
Sample ID: CI Multiplier: 8
Dilution: 1

8 Client: Soil Mechanics
1 Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP4 ES 2 0.70

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\065B1801.D



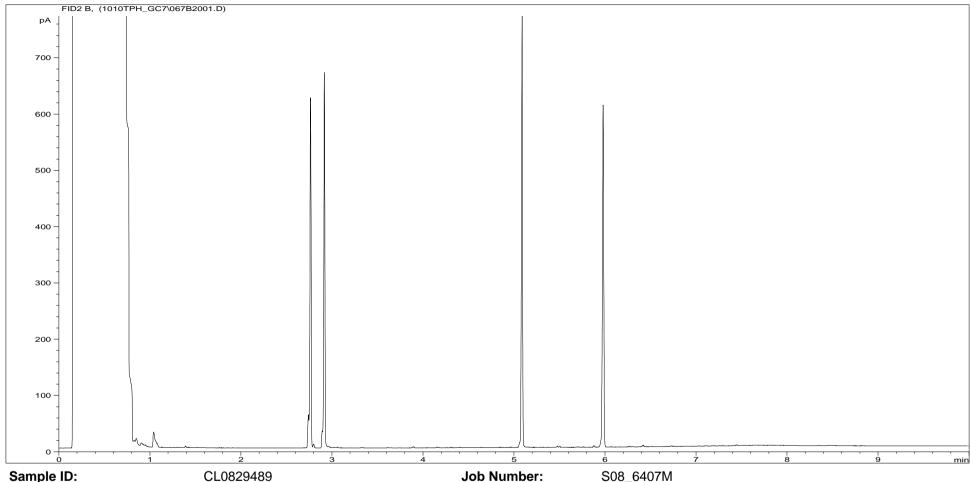
Sample ID: Multiplier: 8

Client: Soil Mechanics Dilution: Hirwaun Industrial Estate Site:

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP5 ES 1 0.30

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\066B1901.D



Sample ID: CL0829489 Multiplier: 8 Dilution:

Client: Soil Mechanics Site:

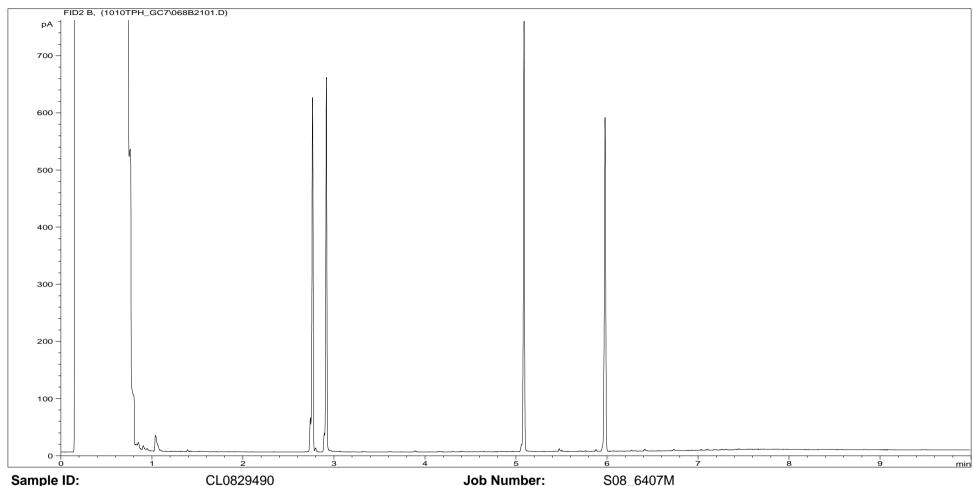
Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP6 ES 1 0.30

Acquisition Date/Time: 10-Oct-08

D:\TES\DATA\Y2008\1010TPH_GC7\067B2001.D

Datafile:



Sample ID: CL0829490 Multiplier: 8 Dilution:

Client: Soil Mechanics

5UL_RUNFNORACE.M

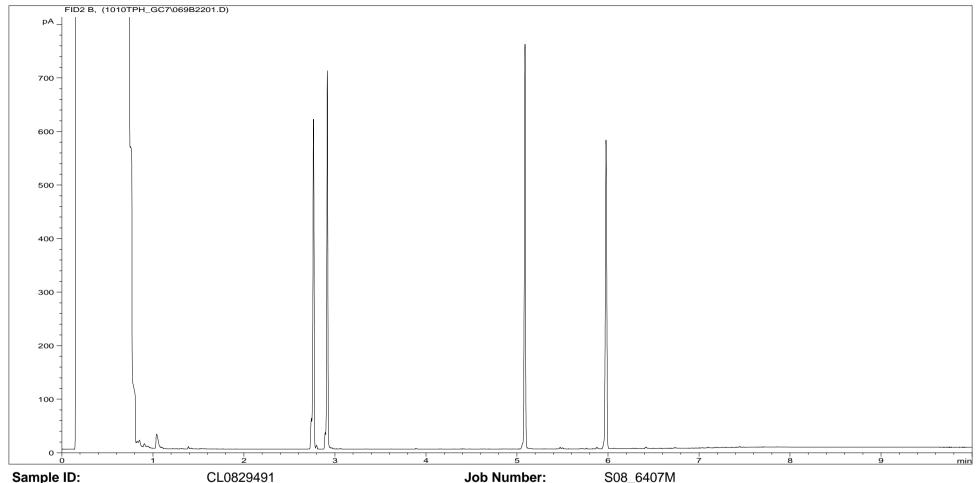
Hirwaun Industrial Estate Site:

Acquisition Method:

Client Sample Ref: TP7 ES 1 0.30

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\068B2101.D



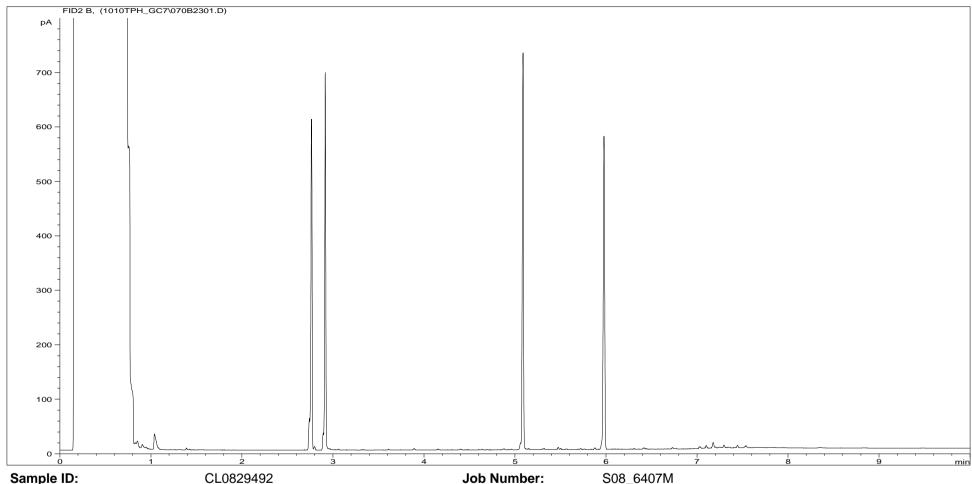
Sample ID: CL Multiplier: 8 Dilution: 1

8 Client: Soil Mechanics
1 Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP8 ES 1 0.30

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\069B2201.D



Sample ID: CL0829492
Multiplier: 8

Dilution:1Site:Hirwaun Industrial Estate

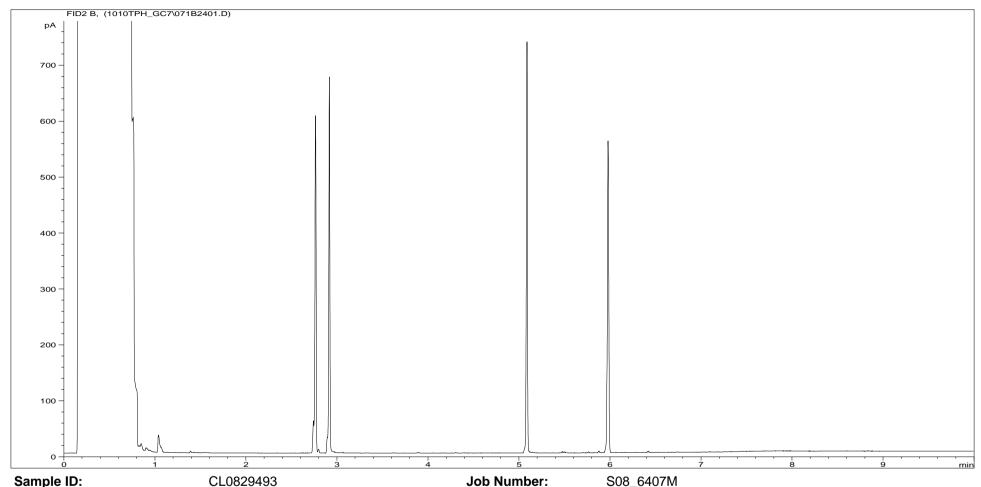
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Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\070B2301.D

Client:

Soil Mechanics



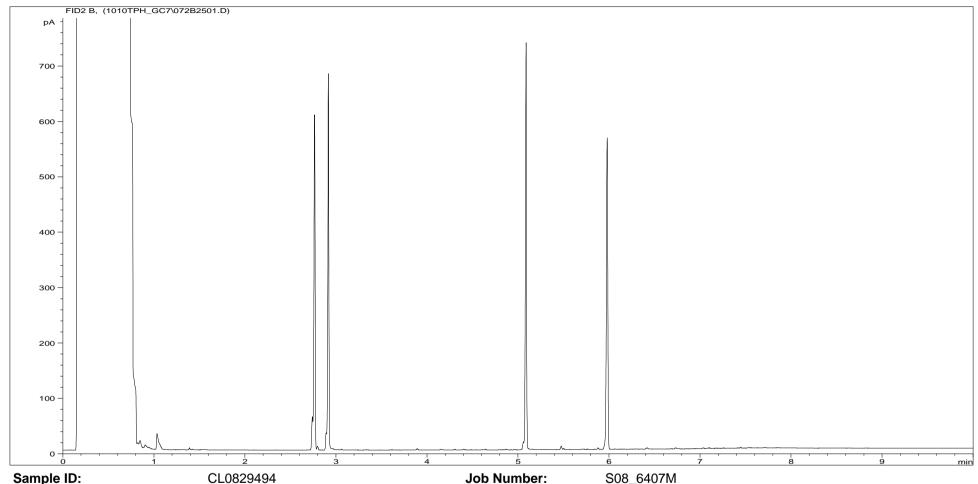
Sample ID: CL083 Multiplier: 8

tiplier: 8 Client: Soil Mechanics
tion: 1 Site: Hirwaun Industr

Dilution:1Site:Hirwaun Industrial EstateAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:TP9 ES 2 0.70

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\071B2401.D



Sample ID: Multiplier: 8

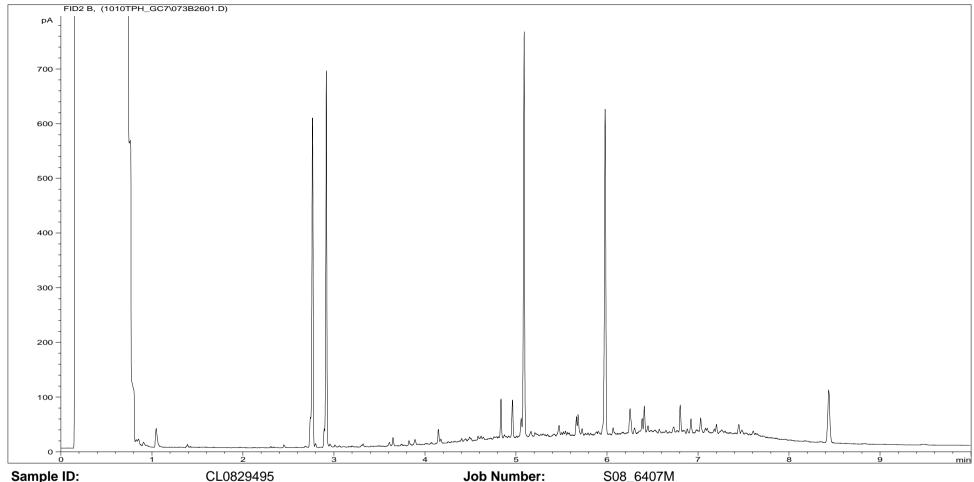
Client: Soil Mechanics Dilution: Site:

Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP10 ES 1 0.30

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\072B2501.D



Sample ID: CL0829495 Multiplier:

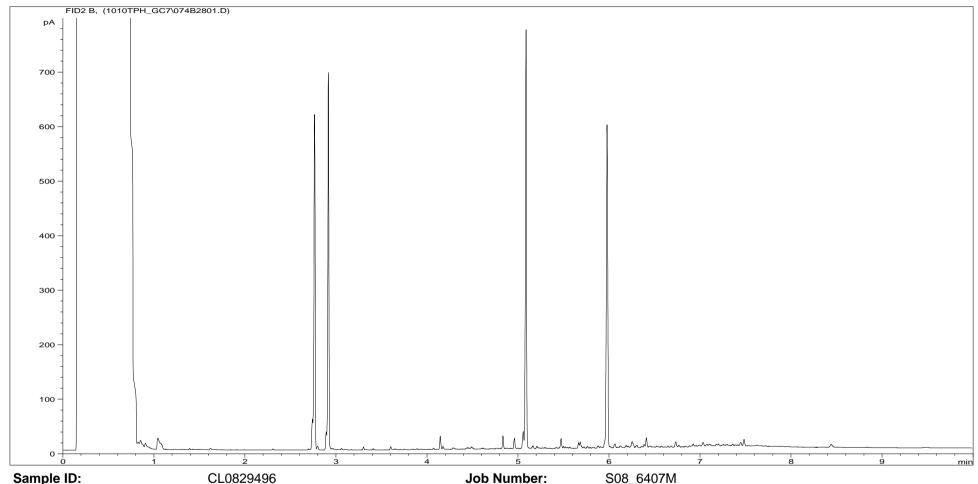
Client: Soil Mechanics 8

Dilution: Hirwaun Industrial Estate Site: TP10 ES 2 0.70

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref:

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\073B2601.D



Sample ID: CLC
Multiplier: 8

ultiplier: 8 Client: Soil Mechanics

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP11 ES 2 1.60

Acquisition Date/Time: 10-Oct-08

Datafile: D:\TES\DATA\Y2008\1010TPH_GC7\074B2801.D

Report Notes

Soil/Solid analysis specific:

S04 analysis not conducted in accordance with BS1377 unless otherwise stated Water Soluble Sulphate on 2:1 water:soil extract AR denotes analysis conducted on the As Received sample

Water analysis specific:

Results expressed as mg/l unless stated otherwise

Oil analysis specific:

Results expressed as mg/kg unless stated otherwise S.G. expressed as g/cm³@ 15°C

Filter analysis specific:

Results expressed as mg on filter unless stated otherwise

VOC analysis specific:

Explanatory notes for data flagging

U = undetected above reporting limit

J = concentration at instrument was below lowest calibration standard

E = concentration at instrument was above top calibration standard

B = compound was detected in method blank

Gas (Tedlar bag) analysis specific:

Results expressed as ug/l unless stated otherwise

Air (Carbon tube) analysis specific:

Results expressed as ug on tube unless stated otherwise

Asbestos analysis specific:

CH denotes Chrysotile

CR denotes Crocidolite

AM denotes Amosite

NADIS denotes No Asbestos Detected in Sample

NBFO denotes No Bulk fibres Observed

General notes:

^ this analysis was subcontracted to another laboratory

\$ Within laboratory tolerances

\$\$ unable to analyse due to nature of sample

¥ Results for guidance only, possible interference

& Blank corrected

I.S insufficient sample for analysis

Intf Unable to analyse due to interferences

N.D Not determined

N.R Not recorded

N.Det Not detected

Req Analysis Requested, see attached sheets for results

Þ Raised detection limit due to nature of sample

* denotes that all accreditation has been removed by the laboratory for this result.

‡ denotes that Mcerts accreditation has been removed by the laboratory for this result.

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory

may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected.

If you require further details of the circumstances leading to the removal of the accreditation from any data item please do not hesitate to contact the laboratory

Page 23 EFS/086407M Ver. 2



TEST REPORT SOIL SAMPLE ANALYSIS





TES Report No. EFS/086384M (Ver. 1)

Soil Mechanics Unit 15 Crosby Yard Bridgend Mid Glamorgan CF31 1JZ

Site: Hirwaun Industrial Estate

The 20 samples described in this report were logged for analysis by TES Bretby on 05-Oct-2008. The analysis was completed by: 21-Oct-2008

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by TES Bretby Laboratories.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of TPH Texas banding (std) (Page 5)
GC-FID Chromatograms (Pages 6 to 25)
Table of Report Notes (Page 26)

On behalf of TES Bretby:
J Hannah

Project Co-ordinator

Date of Issue: 21-Oct-2008

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS)

Tests marked '^' have been subcontracted to another laboratory.

(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.

All results are reported on a dry weight basis at 105°C unless otherwise stated. (except QC samples) TES Bretby accepts no responsibility for any sampling not carried out by our personnel.

Sample Descriptions

Client: Soil Mechanics

Site: Hirwaun Industrial Estate

Report Number: \$08_6384M

| Lab ID Number | Client ID | Description |
|---------------|------------------|-------------------|
| CL/0829247 | TP3 ES 3 1.20 | Brown SILT |
| CL/0829248 | TP3 ES 4 1.90 | Brown SILT |
| CL/0829249 | TP5 ES 4 2.00 | Brown SILT |
| CL/0829250 | TP6 ES 5 2.60 | Brown CLAY |
| CL/0829251 | TP8 ES 4 1.50 | Brown SILT |
| CL/0829252 | BH101 ES 6 2.50 | Brown Gravel SILT |
| CL/0829253 | BH101 ES 10 4.50 | Brown Stone SILT |
| CL/0829254 | BH102 ES 7 2.50 | Brown CLAY |
| CL/0829255 | BH103 ES 3 0.70 | Brown CLAY |
| CL/0829256 | BH104 ES 9 3.50 | Brown CLAY |
| CL/0829257 | BH104 ES 13 5.50 | Brown CLAY |
| CL/0829258 | BH105 ES 6 2.50 | Brown CLAY |
| CL/0829259 | BH105 ES 8 3.50 | Brown CLAY |
| CL/0829260 | BH106 ES 10 1.50 | Brown CLAY |
| CL/0829261 | BH106 ES 7 2.50 | Brown CLAY |
| CL/0829262 | BH107 ES 2 0.70 | Brown CLAY |
| CL/0829263 | BH108 ES 2 0.70 | Brown Gravel SILT |
| CL/0829264 | BH109 ES 1 0.30 | Brown CLAY |
| CL/0829265 | BH109 ES 6 2.50 | Brown Gravel SILT |
| CL/0829266 | BH101 ES 0.70 | Brown Gravel SILT |
| | | |
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| | | |

TES Bretby EFS/086384M Ver. 1

| 0829266 0829252 0829253 0829254 0829255 0829256 0829256 | Method Codes : Method Reporting Limits : Accreditation Code: Client Sample Description | ELESULP 20 UM Elemental Sulphur | 20 UM SO4- (acid sol) | CPMSS 0.5 D Antimony (MS) | ICPMSS 2 UM Arsenic | U U | 3 UM | ICPMSS 3 UM | 3.5 UM | 0.10 U | ICPMSS 0.5 U | 2.5 UM | U U | ICPMSS 19.5 UM | TMSS 0.2 U | 10.0 UM | 10.0 |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------|-----------------------------|---------------------------------|------------------------------|--------------|---------------|-------------------|-----------|--------------|--------------------|-------------|---------------|----------------------|---------------------|-------------------|---------------------|
| 0829266 0829252 0829253 0829254 0829255 0829256 | Accreditation Code: Client Sample Description | UM | UM \$04- | U | UM | U | UM | | | | | | | | | | 10.0 |
| 0829266 0829252 0829253 0829254 0829255 0829256 | Client Sample Description | | S04- | | | | | <u> </u> | <u> </u> | | | J | | 5.m. | <u> </u> | | |
| 0829252 0829253 0829254 0829255 0829256 | | | | MS) | nic (MS) | Cadmium (MS) | Chromium (MS) | Copper (MS) | Lead (MS) | Mercury (MS) | Molybdenum (MS) | Nickel (MS) | Selenium (MS) | Zinc (MS) | Tot.Moisture @ 105C | TPH by GCFID (AR) | TPH Carbon Banding. |
| 0829253 0829254 0829255 0829256 | BH101 ES 0.70 | <19 | <19 | <0.5 | 5.4 | <0.1 | 44.3‡ | 8 | 9.3 | <0.1 | 4.2 | 13.5 | <0.5 | 30.2 | 12.5 | 61 | Req |
| 0829254 0829255 0829256 | BH101 ES 6 2.50 | 28 | 2310 | <0.5 | 2.3 | <0.1 | 21‡ | 4.9 | 33.2 | <0.1 | <0.5 | 5.1 | 1.1 | <20.3 | 10.5 | 11.2 | Req |
| 0829255 0829256 | BH101 ES 10 4.50 | <22 | 70 | <0.5 | 2.3 | <0.1 | 9.8‡ | 6.6 | 9.7 | <0.1 | <0.5 | 15.9 | <0.5 | 29.8 | 16.3 | <11.9 | Req |
| 0829256 | BH102 ES 7 2.50 | <21 | <21 | <0.5 | 4.4 | <0.1 | 7.9‡ | 7.4 | 9 | <0.1 | <0.5 | 13 | <0.5 | 27.8 | 14.5 | <11.7 | Req |
| | BH103 ES 3 0.70 | 21 | 144 | <0.5 | 7.3 | 0.2 | 13.1‡ | 14.8 | 16.3 | <0.1 | <0.5 | 18.7 | <0.5 | 54.1 | 16.3 | <11.9 | Req |
| 0829257 | BH104 ES 9 3.50 | <21 | 142 | <0.5 | 10 | <0.1 | 17.8‡ | 18.5 | 20 | <0.1 | <0.5 | 25.4 | <0.5 | 38.8 | 26.0 | <13.5 | Req |
| | BH104 ES 13 5.50 | <21 | <21 | <0.5 | 3 | <0.1 | 13.1‡ | 14 | 15.1 | <0.1 | <0.5 | 21.2 | <0.5 | 38.2 | 14.9 | <11.8 | Req |
| 0829258 | BH105 ES 6 2.50 | <21 | 118 | <0.5 | 6.5 | 0.16 | 14.5‡ | 22.8 | 17.8 | <0.1 | <0.5 | 18.9 | <0.5 | 103.1 | 19.9 | <12.5 | Req |
| 0829259 | BH105 ES 8 3.50 | <21 | <21 | <0.5 | 7.9 | <0.1 | 14.5‡ | 14.7 | 14.8 | <0.1 | <0.5 | 18.7 | <0.5 | 36.5 | 17.1 | 94 | Req |
| 0829260 | BH106 ES 10 1.50 | <21 | 240 | <0.5 | 6.7 | 0.25 | 12.5‡ | 12.2 | 14.3 | <0.1 | <0.5 | 11.5 | 0.6 | 93 | 18.6 | 12.3 | Req |
| 0829261 | BH106 ES 7 2.50 | <21 | 32 | <0.5 | 9.4 | <0.1 | 18.9‡ | 20.3 | 21 | <0.1 | <0.5 | 22 | <0.5 | 49.5 | 19.1 | <12.4 | Req |
| 0829262 | BH107 ES 2 0.70 | <20 | 34 | <0.5 | 7.2 | 0.1 | 14.9‡ | 16 | 18.9 | <0.1 | <0.5 | 23.8 | <0.5 | 46.6 | 12.7 | <11.5 | Req |
| 0829263 | BH108 ES 2 0.70 | <19 | <19 | <0.5 | 5 | <0.1 | 8.3‡ | 8.2 | 13 | <0.1 | <0.5 | 16 | <0.5 | 36.8 | 14.2 | <11.7 | Req |
| 0829264 | BH109 ES 1 0.30 | <21 | 95 | 0.7 | 9.6 | 0.23 | 11.5‡ | 16 | 21.6 | <0.1 | <0.5 | 19.8 | <0.5 | 67.4 | 13.4 | 104 | Req |
| 0829265 | BH109 ES 6 2.50 | 20 | 205 | <0.5 | 6.3 | 0.12 | 9.4‡ | 8.2 | 12.5 | <0.1 | <0.5 | 13.4 | <0.5 | 28.1 | 16.8 | 302 | Req |
| 0829247 | TP3 ES 3 1.20 | <20 | 103 | <0.5 | 5.6 | <0.1 | 8.8‡ | 10.5 | 12.6 | <0.1 | <0.5 | 13.4 | <0.5 | 30.7 | 10.6 | <11.2 | Req |
| 0829248 | TP3 ES 4 1.90 | <21 | 22 | <0.5 | 5 | <0.1 | 11.1‡ | 16 | 15.5 | <0.1 | <0.5 | 15.4 | <0.5 | 37.7 | 8.9 | <11.0 | Req |
| 0829249 | TP5 ES 4 2.00 | <20 | 68 | <0.5 | 6.1 | 0.15 | 10‡ | 12.3 | 14.2 | <0.1 | <0.5 | 16 | <0.5 | 43.8 | 9.6 | <11.1 | Req |
| 0829250 | TP6 ES 5 2.60 | <22 | 29 | 0.6 | 8.6 | 0.21 | 11.2‡ | 12.4 | 15.3 | 0.94 | <0.6 | 16.8 | <0.6 | 51.5 | 13.0 | <11.5 | Req |
| 0829251 | TP8 ES 4 1.50 | <20 | 57 | <0.5 | 5.5 | <0.1 | 8.8‡ | 10.6 | 11.3 | <0.1 | <0.5 | 13.9 | <0.5 | 33.9 | 10.2 | <11.1 | Req |
| РО Во | ES Bretby Box 100, Bretby Business Park, ton-on-Trent, Staffordshire, DE15 0XD | Client Na | ame | Soil Me | chanics odroffe | | | | | | S Date Prin | | imple A | Analysis | 21-Oct-08 | | S |
| Tel + | +44 (0) 1283 554400 | | | | | | | | | | Report N | umber | | EFS | S/086384M | Bre | etby |
| Fax + | | | | Hirw | alin li | nduiet | rial 🗀 | C+2+2 | | | | | | | | | |
| - | c +44 (0) 1283 554422 | | | | aun II | iuust | ııaı 🗅 | อเลเษ | | | Table Nu | | | | 1 | | |

| | Units : | pH Units | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % M/M | | I | |
|-------------------|---------------------------------------------------------------------------------------------------------------|----------|---------------------|----------|-----------|--------------|-----------------|----------------------|--------------------|---------------------|-------------------|----------------------|--------------------|-----------|---------------------|-----------|--|
| | Method Codes : | WSLM3 | ICPBOR | ICPMAJ | KONECL | KONECR | PAHSCUV | SEN9 | SFAPI | SFAPI | SFAPI | SFAPI | SFAS | WSLM59 | | | |
| | Method Reporting Limits : Accreditation Code: | U | 0.5 N | 1 N | 5.0 N | 0.1 N | 10 N | N | 0.5 N | 0.5 N | 0.5 N | 2 N | 0.5 N | 0.02 N | | | |
| TES ID Number CL/ | Client Sample Description | pH units | Boron (H20 Soluble) | Barium | Chloride: | Chromium vi: | PAH (screening) | Asbestos (screening) | Cyanide(Free) (AR) | Cyanide(Total) (AR) | Phenol Index.(AR) | Thiocyanate(SCN)(AR) | Sulphide as S (AR) | F.O.C. % | | | |
| 0829266 | BH101 ES 0.70 | 8.5 | <0.5 | 61 | 17 | <0.1 | <10 | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.44 | | | |
| 0829252 | BH101 ES 6 2.50 | 11.5 | <0.5 | 611 | 53 | <0.1 | <10 | .,,,, | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 2.13 | | | |
| 0829253 | BH101 ES 10 4.50 | 8.6 | <0.5 | 45 | 20 | <0.1 | <11 | | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.55 | | | |
| 0829254 | BH102 ES 7 2.50 | 7.8 | <0.5 | 63 | 11.4 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.3 | | | |
| 0829255 | BH103 ES 3 0.70 | 8.3 | <0.5 | 110 | 24 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 1.14 | | | |
| 0829256 | BH104 ES 9 3.50 | 5.7 | <0.5 | 82 | 21 | <0.1 | <11 | | <0.7 | <0.7 | <0.7 | <2.7 | <0.7 | 0.43 | | | |
| 0829257 | BH104 ES 13 5.50 | 7.9 | <0.5 | 75 | 21 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.61 | | | |
| 0829258 | BH105 ES 6 2.50 | 7.3 | <0.5 | 155 | 26 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 0.85 | | | |
| 0829259 | BH105 ES 8 3.50 | 5.8 | <0.5 | 88 | 35 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.72 | | | |
| 0829260 | BH106 ES 10 1.50 | 7.8 | <0.5 | 255 | 37 | <0.1 | 14 | | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 1.1 | | | |
| 0829261 | BH106 ES 7 2.50 | 6.8 | <0.5 | 123 | 23 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 0.53 | | | |
| 0829262 | BH107 ES 2 0.70 | 8.0 | <0.5 | 190 | 23 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.5 | | | |
| 0829263 | BH108 ES 2 0.70 | 7.7 | <0.5 | 134 | 16 | <0.1 | 32 | | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.27 | | | |
| 0829264 | BH109 ES 1 0.30 | 7.9 | <0.5 | 121 | 20 | <0.1 | 22 | | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 1.51 | | | |
| 0829265 | BH109 ES 6 2.50 | 8.7 | 0.6 | 75 | 43 | <0.1 | 17 | | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 1.26 | | | |
| 0829247 | TP3 ES 3 1.20 | 6.7 | <0.5 | 22 | 18 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.52 | | | |
| 0829248 | TP3 ES 4 1.90 | 6.8 | <0.5 | 3 | 21 | <0.1 | <10 | | <0.5 | <0.5 | <0.5 | <2.2 | <0.5 | 0.28 | | | |
| 0829249 | TP5 ES 4 2.00 | 7.5 | <0.5 | 71 | 19 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.58 | | | |
| 0829250 | TP6 ES 5 2.60 | 7.5 | <0.6 | 91 | 28 | <0.1 | <11 | | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 1.2 | | | |
| 0829251 | TP8 ES 4 1.50 | 6.5 | <0.5 | 19 | 22 | <0.1 | <10 | | <0.6 | <0.6 | <0.6 | <2.2 | <0.6 | 0.38 | | | |
| | TES Bretby PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 | Client N | | Mr H Woo | | ndust | trial E | state | | , | Date Prii | nted | ample A | | 1-Oct-08 086384M | <i>TE</i> | |
| | Fax +44 (0) 1283 554422 | | | 1 111 VV | auii II | iiuusi | | State | | | Table Nu | ımber | | | 1 | | |

| | Units : | ug/kg | ug/kg | ug/kg | ug/kg | | | | | | |
|-------------------|------------------------------------------------------------------------------------------|----------|---------|---------------|---------------------|------------------|-----------------------------------------------|----------------|--------------------------------------|-----|-----|
| | Method Codes : | BTEXHSA | BTEXHSA | BTEXHSA | BTEXHSA | | | | | | |
| | Method Reporting Limits: | 10 N | 10 N | 10 N | 20 N | | | | | | |
| | Accreditation Code: | IN | IN | IN | IN | | | | | | |
| TES ID Number CL/ | Client Sample Description | Benzene | Toluene | Ethyl Benzene | Xylenes | | | | | | |
| 0829266 | BH101 ES 0.70 | <11 | <11 | <11 | <23 | | | | | | |
| 0829252 | BH101 ES 6 2.50 | <11 | <11 | <11 | <22 | | | | | | |
| 0829253 | BH101 ES 10 4.50 | <12 | <12 | <12 | <24 | | | | | | |
| 0829254 | BH102 ES 7 2.50 | <12 | <12 | <12 | <23 | | | | | | |
| 0829255 | BH103 ES 3 0.70 | <12 | <12 | <12 | <24 | | | | | | |
| 0829256 | BH104 ES 9 3.50 | <14 | <14 | <14 | <27 | | | | | | |
| 0829257 | BH104 ES 13 5.50 | <29 | <29 | <29 | <59 | | | | | | |
| 0829258 | BH105 ES 6 2.50 | <31 | <31 | <31 | <62 | | | | | | |
| 0829259 | BH105 ES 8 3.50 | <12 | <12 | <12 | <24 | | | | | | |
| 0829260 | BH106 ES 10 1.50 | <12 | <12 | <12 | <25 | | | | | | |
| 0829261 | BH106 ES 7 2.50 | <12 | <12 | <12 | <25 | | | | | | |
| 0829262 | BH107 ES 2 0.70 | <11 | <11 | <11 | <23 | | | | | | |
| 0829263 | BH108 ES 2 0.70 | <12 | <12 | <12 | <23 | | | | | | |
| 0829264 | BH109 ES 1 0.30 | <12 | <12 | <12 | <23 | | | | | | |
| 0829265 | BH109 ES 6 2.50 | <12 | <12 | <12 | <24 | | | | | | |
| 0829247 | TP3 ES 3 1.20 | <11 | <11 | <11 | <22 | | | | | | |
| 0829248 | TP3 ES 4 1.90 | <11 | <11 | <11 | <22 | | | | | | |
| 0829249 | TP5 ES 4 2.00 | <11 | <11 | <11 | <22 | | | | | | |
| 0829250 | TP6 ES 5 2.60 | <11 | <11 | <11 | <23 | | | | | | |
| 0829251 | TP8 ES 4 1.50 | <11 | <11 | <11 | <22 | | | | | | |
| | TES Bretby PO Box 100, Bretby Business Park, | Client N | | Soil Me | echanics odroffe | | Soils Sa | ample Analysis | | TE | S |
| | Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | | | Hirw | aun I | ndustrial Estate | Date Printed Report Number Table Number | 21· EFS/08 | -Oct-08 36384M 1 | Bre | tby |

Total Petroleum Hydrocarbons (TPH) Carbon Ranges

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

Job Number: S08_6384M

QC Batch Number: 83541

Directory: D:\TES\DATA\Y2008\1009TPH_GC7\075B2901.D

Method: Ultra Sonic

Accreditation code: U

| | | | Concentra | ation, (mg/kg) - as o | dry weight. | |
|-----------|------------------|-----------|------------|-----------------------|-------------|------------|
| Sample ID | Client ID | >C8 - C10 | >C10 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 |
| CL0829247 | TP3 ES 3 1.20 | <2 | <2 | <2 | <2 | 4.93 |
| CL0829248 | TP3 ES 4 1.90 | <2 | <2 | <2 | <2 | <4.81 |
| CL0829249 | TP5 ES 4 2.00 | <2 | <2 | <2 | <2 | <4.85 |
| CL0829250 | TP6 ES 5 2.60 | <2 | <2 | <2 | <2 | <5.03 |
| CL0829251 | TP8 ES 4 1.50 | <2 | <2 | <2 | <2 | <4.88 |
| CL0829252 | BH101 ES 6 2.50 | <2 | <2 | <2 | 2.87 | <4.89 |
| CL0829253 | BH101 ES 10 4.50 | <2 | <2 | <2 | <2 | <5.23 |
| CL0829254 | BH102 ES 7 2.50 | <2 | <2 | <2 | <2 | <5.12 |
| CL0829255 | BH103 ES 3 0.70 | <2 | <2 | <2 | <2 | <5.23 |
| CL0829256 | BH104 ES 9 3.50 | <3 | <3 | <3 | <3 | <5.92 |
| CL0829257 | BH104 ES 13 5.50 | <2 | <2 | <2 | <2 | <5.15 |
| CL0829258 | BH105 ES 6 2.50 | <2 | <2 | <2 | <2 | <5.47 |
| CL0829259 | BH105 ES 8 3.50 | <2 | <2 | <2 | <2 | 84.9 |
| CL0829260 | BH106 ES 10 1.50 | <2 | <2 | <2 | <2 | 8.02 |
| CL0829261 | BH106 ES 7 2.50 | <2 | <2 | <2 | <2 | <5.41 |
| CL0829262 | BH107 ES 2 0.70 | <2 | <2 | <2 | <2 | <5.02 |
| CL0829263 | BH108 ES 2 0.70 | <2 | <2 | <2 | <2 | <5.10 |
| CL0829264 | BH109 ES 1 0.30 | <2 | <2 | 4.47 | 10.5 | 68 |
| CL0829265 | BH109 ES 6 2.50 | <2 | <2 | 4.53 | 59.9 | 226 |
| CL0829266 | BH101 ES 0.70 | <2 | <2 | 12.5 | 17.6 | 23.2 |

Soil

05-Oct-08

08-Oct-08

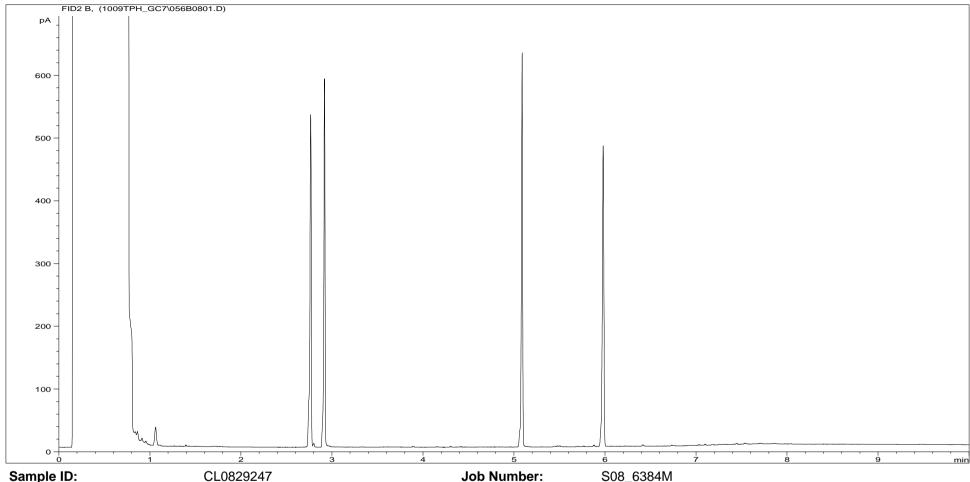
09-Oct-08

Matrix:

Date Booked in:

Date Extracted:

Date Analysed:



Sample ID: CL0829247
Multiplier: 8
Dilution: 1

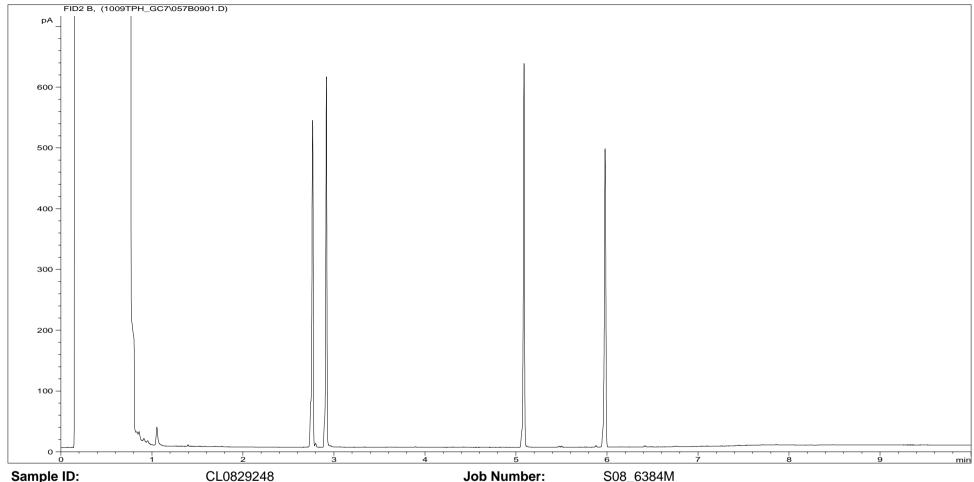
Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Jiution: | Site: milwaun moustlia

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP3 ES 3 1.20

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\056B0801.D



Sample ID:CL0829248Job Number:Multiplier:8Client:

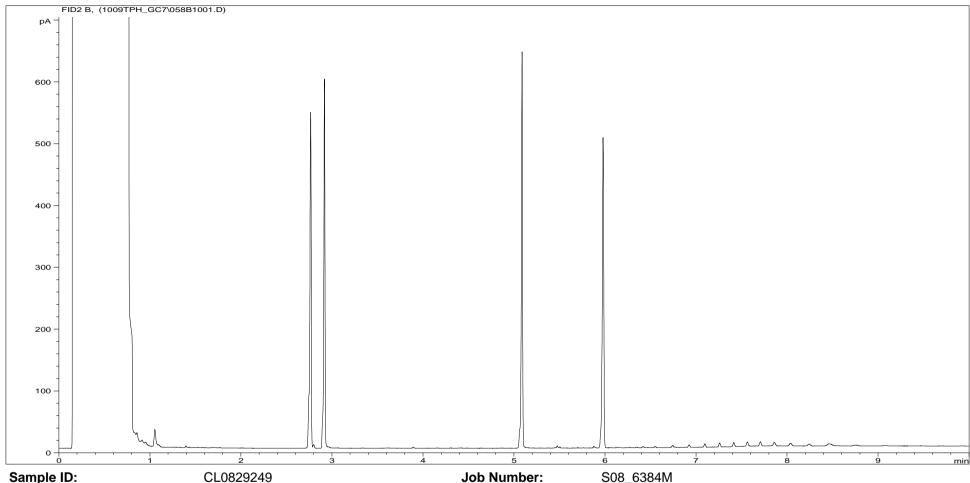
Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP3 ES 4 1.90

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\057B0901.D

Soil Mechanics



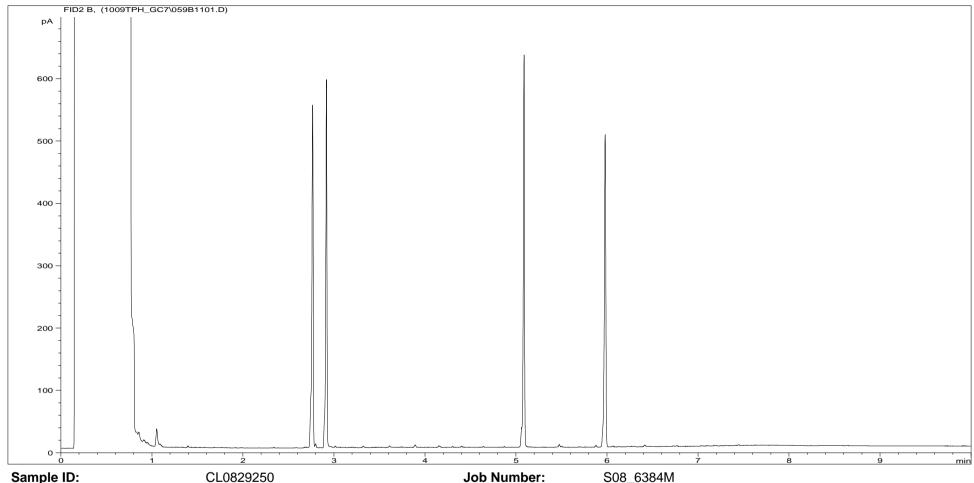
Sample ID: CL0829249
Multiplier: 8
Dilution: 1

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP5 ES 4 2.00

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\058B1001.D



Sample ID:CL0829250Job Number:Multiplier:8Client:

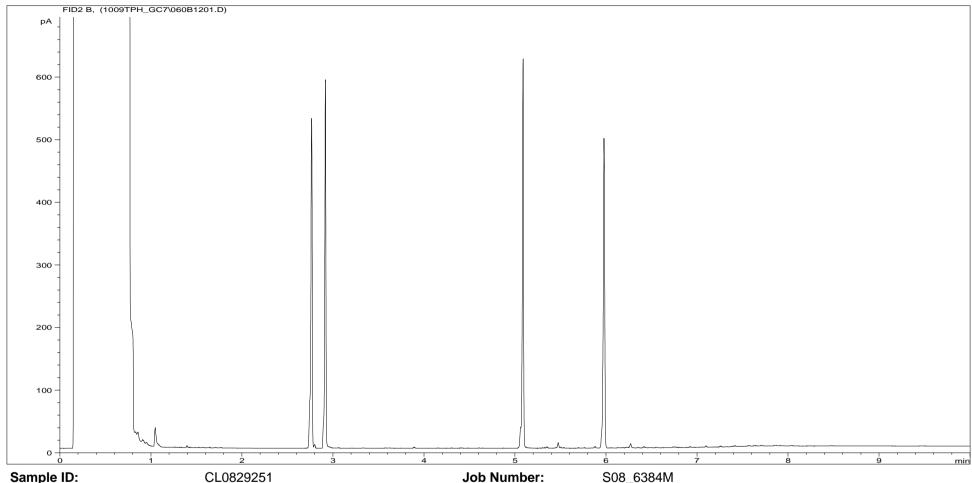
Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP6 ES 5 2.60

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\059B1101.D

Soil Mechanics



Sample ID: Multiplier: 8 Dilution:

Client: Soil Mechanics

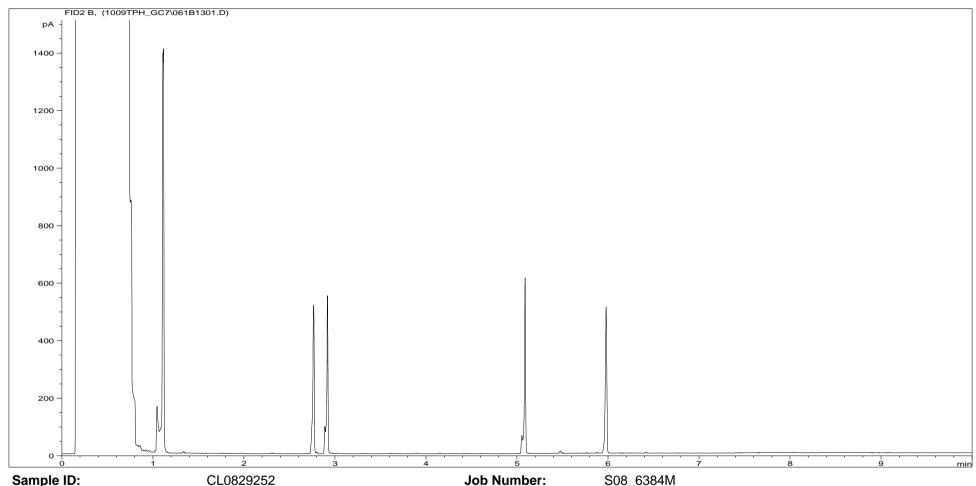
Acquisition Method: 5UL_RUNFNORACE.M

Hirwaun Industrial Estate Site:

Client Sample Ref: TP8 ES 4 1.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\060B1201.D



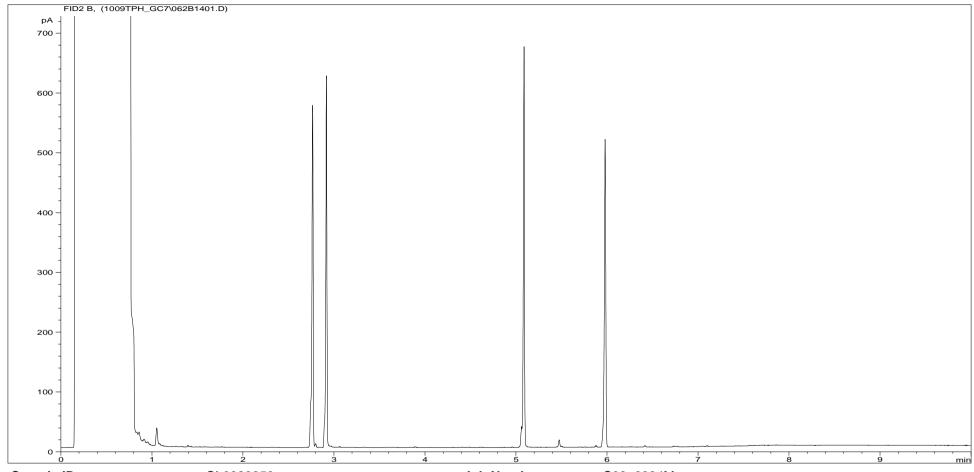
Sample ID: CL08
Multiplier: 8

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Dilution:1Site:Hirwaun Industrial EstatAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:BH101 ES 6 2.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\061B1301.D

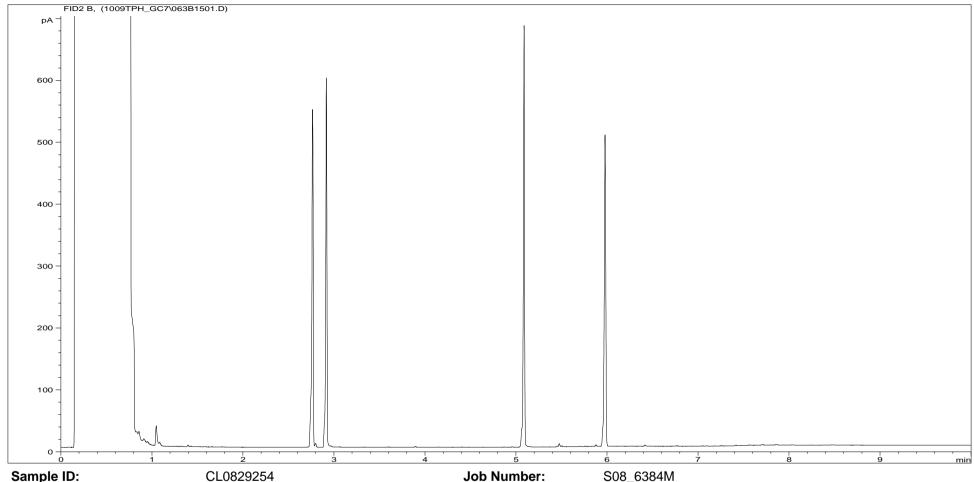


Sample ID:CL0829253Job Number:S08_6384MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial EstateAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:BH101 ES 10 4.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\062B1401.D



Sample ID: CL0829254 Multiplier: 8

Client: Soil Mechanics Site:

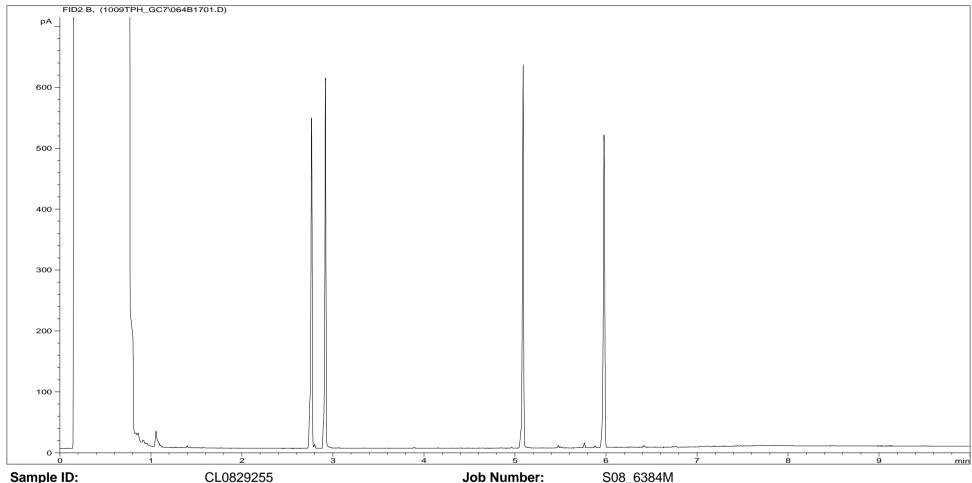
Dilution: **Acquisition Method:** 5UL_RUNFNORACE.M

Hirwaun Industrial Estate Client Sample Ref:

BH102 ES 7 2.50

Acquisition Date/Time: 09-Oct-08

D:\TES\DATA\Y2008\1009TPH_GC7\063B1501.D Datafile:



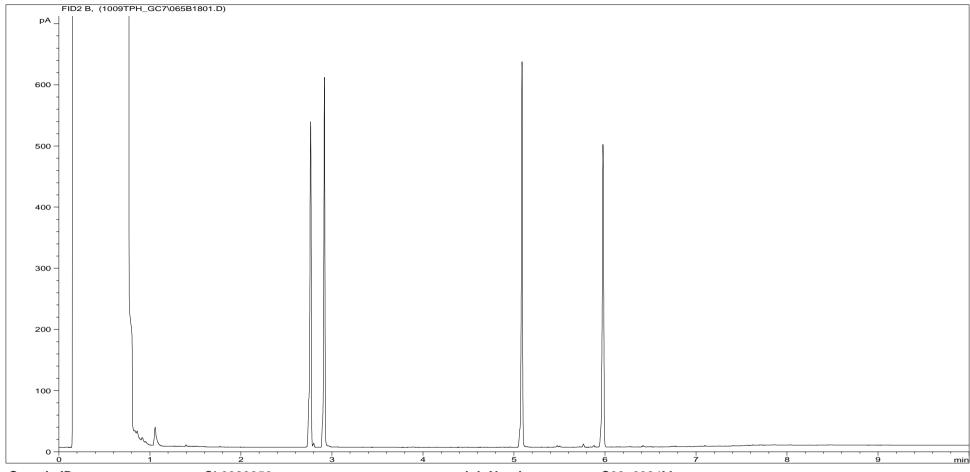
Sample ID: Multiplier: 8

Client: Soil Mechanics Dilution: Hirwaun Industrial Estate Site:

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH103 ES 3 0.70

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\064B1701.D



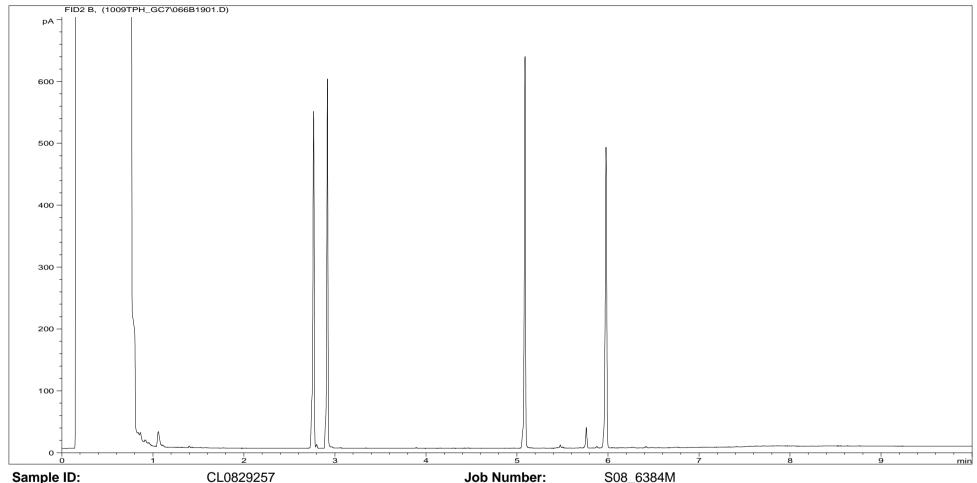
Sample ID:CL0829256Job Number:S08_6384MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH104 ES 9 3.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\065B1801.D



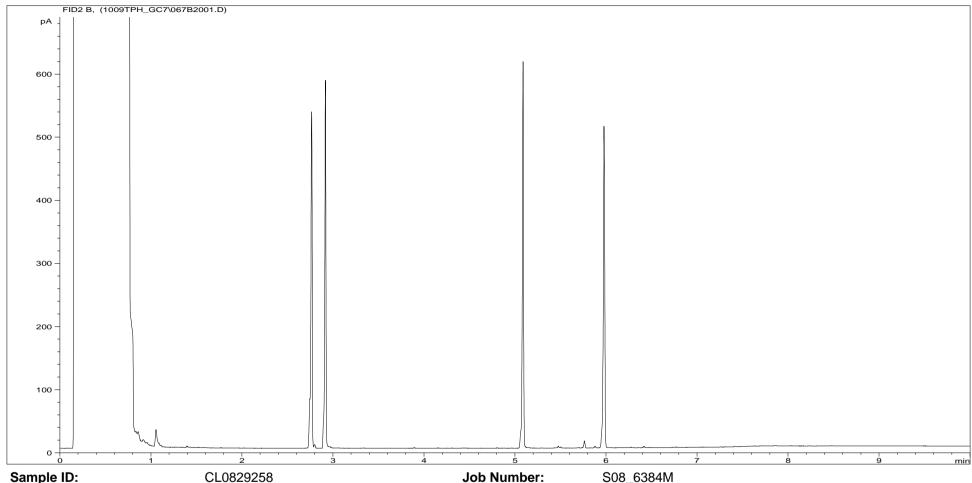
Sample ID: C
Multiplier: 8

Client: Soil Mechanics
Site: Hirwaun Industr

Dilution:1Site:Hirwaun Industrial EstateAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:BH104 ES 13 5.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\066B1901.D



Sample ID: Constitution: 8

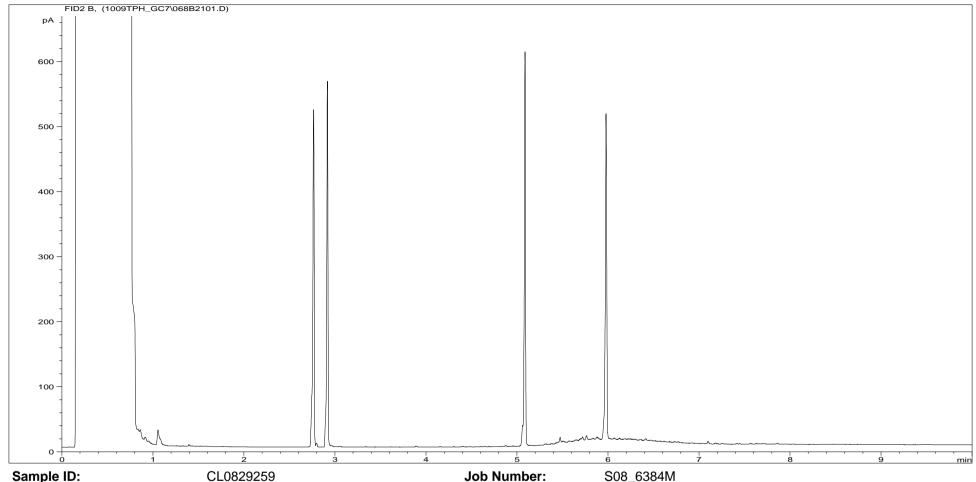
Dilution: 1

8 Client: Soil Mechanics
1 Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH105 ES 6 2.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\067B2001.D



Sample ID: CL0829259 Multiplier: 8 Dilution:

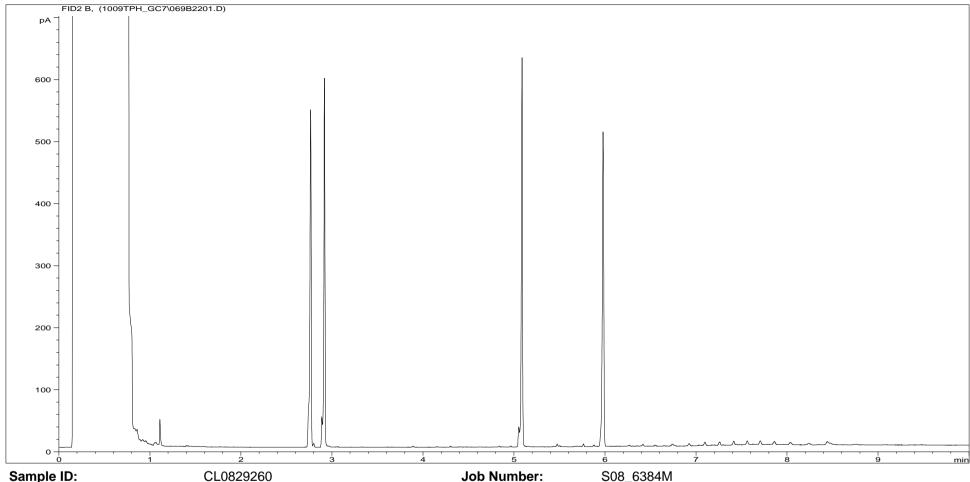
Client: Soil Mechanics Site:

Acquisition Method: 5UL_RUNFNORACE.M Hirwaun Industrial Estate

Client Sample Ref: BH105 ES 8 3.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\068B2101.D



Sample ID: CL0829260 Multiplier: 8 Dilution:

Client: Soil Mechanics

Acquisition Method: 5UL_RUNFNORACE.M

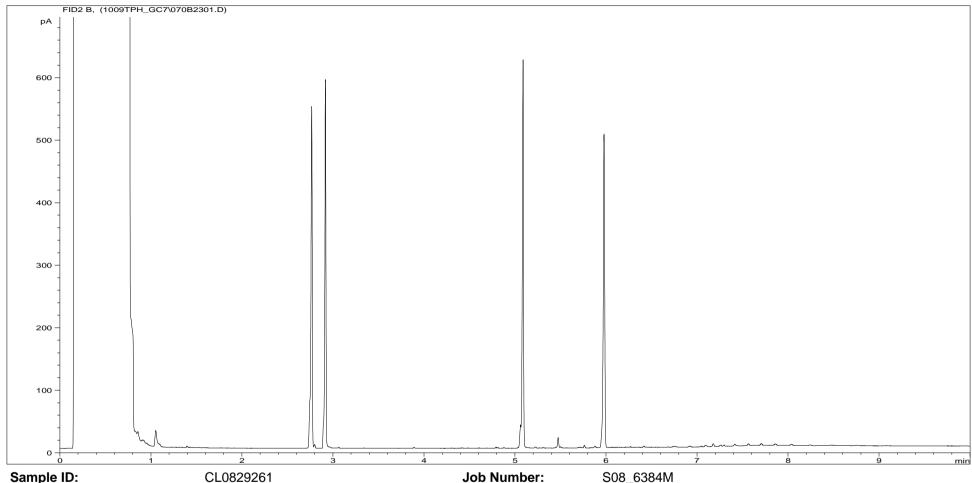
Hirwaun Industrial Estate Site: Client Sample Ref:

BH106 ES 10 1.50

Acquisition Date/Time: 09-Oct-08

D:\TES\DATA\Y2008\1009TPH_GC7\069B2201.D

Datafile:



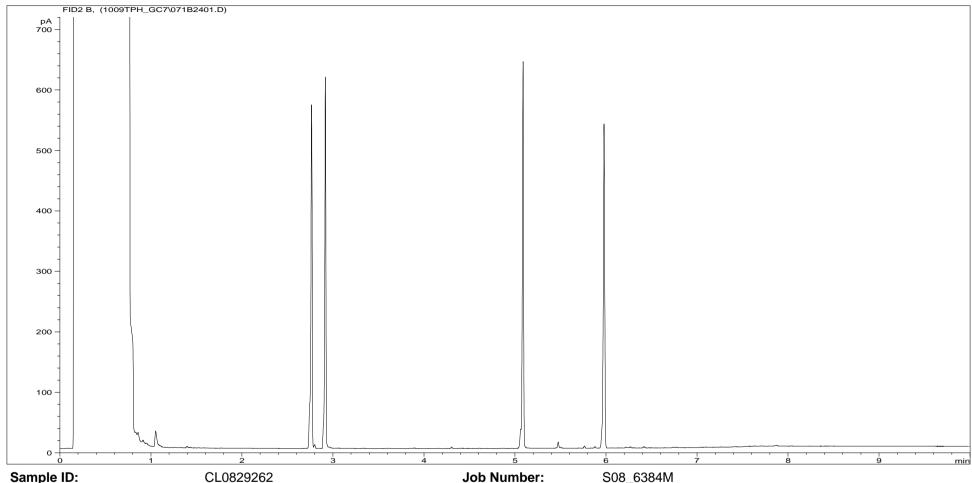
Sample ID: CI Multiplier: 8

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Dilution:1Site:Hirwaun Industrial EsAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:BH106 ES 7 2.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\070B2301.D



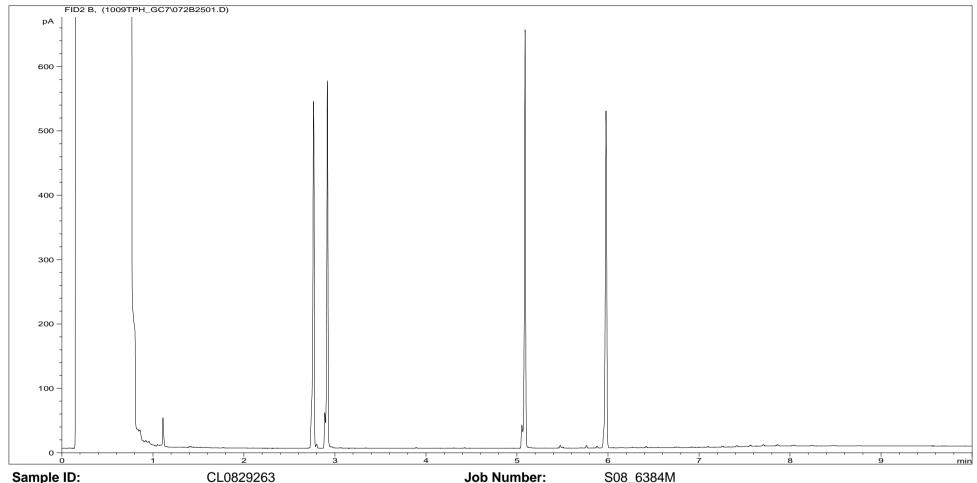
Sample ID: CI Multiplier: 8
Dilution: 1

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH107 ES 2 0.70

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\071B2401.D



Sample ID: CL0829263 Multiplier: 8 Dilution:

Client: Soil Mechanics Site:

Acquisition Method: 5UL_RUNFNORACE.M

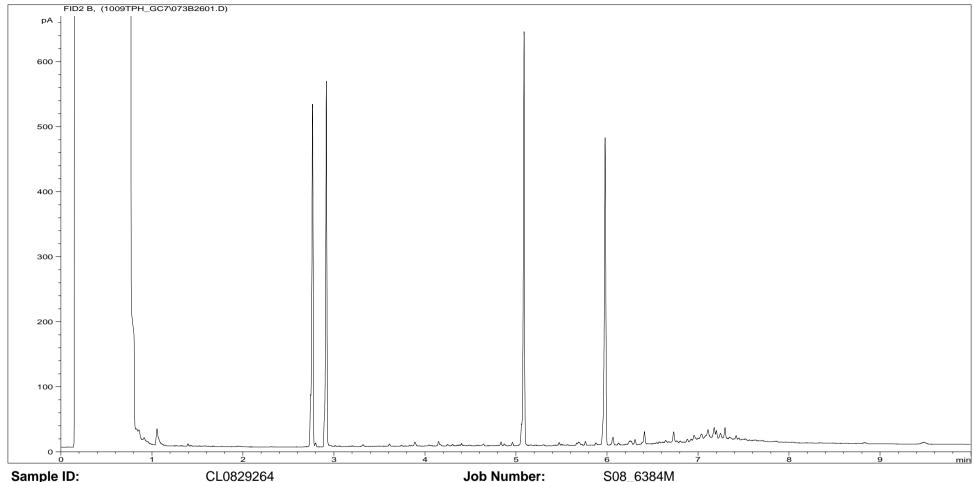
Hirwaun Industrial Estate Client Sample Ref:

BH108 ES 2 0.70

Acquisition Date/Time: 09-Oct-08

D:\TES\DATA\Y2008\1009TPH_GC7\072B2501.D

Datafile:



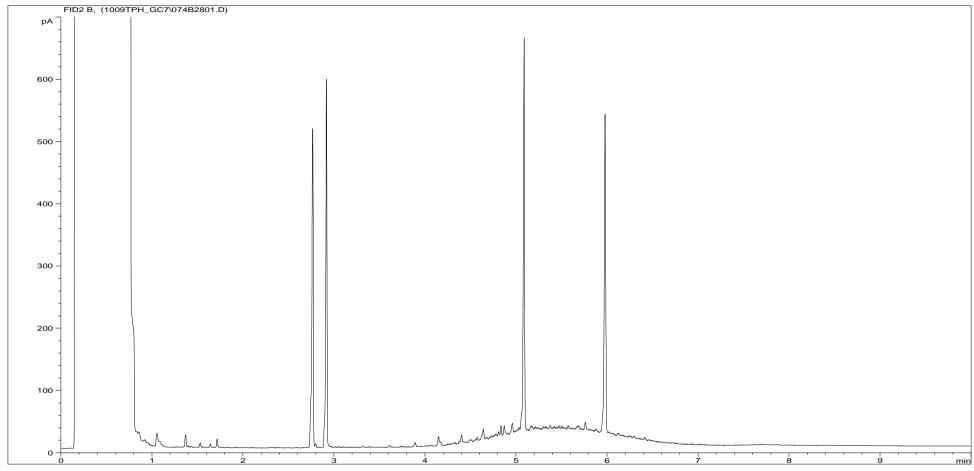
Sample ID:CL0829264Job Number:S08_6384MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH109 ES 1 0.30

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\073B2601.D



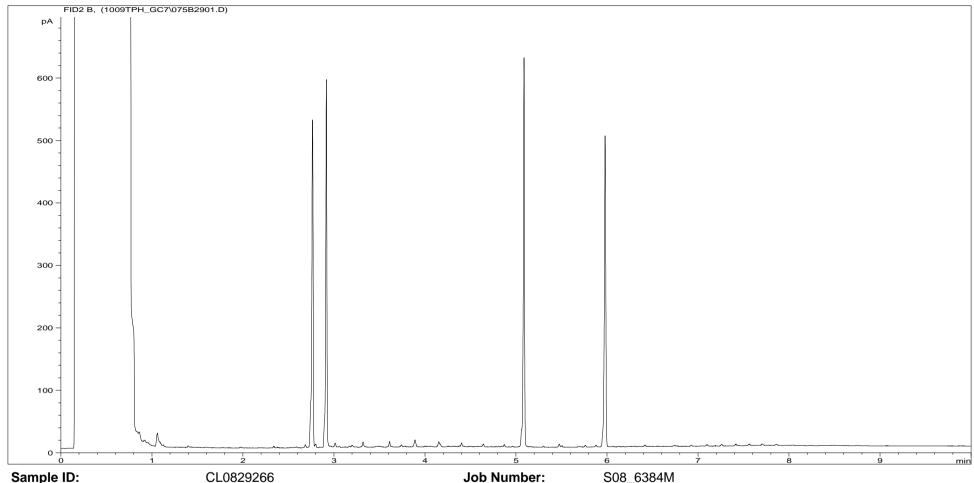
Sample ID:CL0829265Job Number:S08_6384MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH109 ES 6 2.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\074B2801.D



Sample ID:CL0829266Job Number:Multiplier:8Client:

Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH101 ES 0.70

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\075B2901.D

Soil Mechanics

Report Notes

Soil/Solid analysis specific:

S04 analysis not conducted in accordance with BS1377 unless otherwise stated Water Soluble Sulphate on 2:1 water:soil extract AR denotes analysis conducted on the As Received sample

Water analysis specific:

Results expressed as mg/l unless stated otherwise

Oil analysis specific:

Results expressed as mg/kg unless stated otherwise S.G. expressed as g/cm³@ 15°C

Filter analysis specific:

Results expressed as mg on filter unless stated otherwise

VOC analysis specific:

Explanatory notes for data flagging

U = undetected above reporting limit

J = concentration at instrument was below lowest calibration standard

E = concentration at instrument was above top calibration standard

B = compound was detected in method blank

Gas (Tedlar bag) analysis specific:

Results expressed as ug/l unless stated otherwise

Air (Carbon tube) analysis specific:

Results expressed as ug on tube unless stated otherwise

Asbestos analysis specific:

CH denotes Chrysotile

CR denotes Crocidolite

AM denotes Amosite

NADIS denotes No Asbestos Detected in Sample

NBFO denotes No Bulk fibres Observed

General notes:

^ this analysis was subcontracted to another laboratory

\$ Within laboratory tolerances

\$\$ unable to analyse due to nature of sample

¥ Results for guidance only, possible interference

& Blank corrected

I.S insufficient sample for analysis

Intf Unable to analyse due to interferences

N.D Not determined

N.R Not recorded

N.Det Not detected

Req Analysis Requested, see attached sheets for results

Þ Raised detection limit due to nature of sample

* denotes that all accreditation has been removed by the laboratory for this result.

‡ denotes that Mcerts accreditation has been removed by the laboratory for this result.

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory

may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected.

If you require further details of the circumstances leading to the removal of the accreditation from any data item please do not hesitate to contact the laboratory

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TEST REPORT SOIL SAMPLE ANALYSIS





TES Report No. EFS/086382M (Ver. 1)

Soil Mechanics Unit 15 Crosby Yard Bridgend Mid Glamorgan CF31 1JZ

Site: Hirwaun Industrial Estate

The 6 samples described in this report were logged for analysis by TES Bretby on 05-Oct-2008. The analysis was completed by: 21-Oct-2008

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by TES Bretby Laboratories.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of TPH Texas banding (std) (Page 5)
GC-FID Chromatograms (Pages 6 to 11)
Table of Report Notes (Page 12)

On behalf of TES Bretby:
J Hannah

Project Co-ordinator

Date of Issue: 21-Oct-2008

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS)

Tests marked '^' have been subcontracted to another laboratory.

(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.

All results are reported on a dry weight basis at 105°C unless otherwise stated. (except QC samples) TES Bretby accepts no responsibility for any sampling not carried out by our personnel.

Sample Descriptions

Client: Soil Mechanics

Site: Hirwaun Industrial Estate

Report Number: S08_6382M

| Lab ID Number | Client ID | Description |
|---------------|---------------------|--------------------|
| CL/0829232 | BH102 ES 0.30 | Brown CLAY |
| CL/0829233 | BH102 ES 1.50 (NVM) | Brown Gravel STONE |
| CL/0829234 | BH104 ES 0.70 | Brown CLAY |
| CL/0829235 | BH104 ES 1.50 | Brown CLAY |
| CL/0829236 | BH105 ES 0.70 | Brown CLAY |
| CL/0829237 | BH106 ES 0.30 | Brown CLAY |
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TES Bretby EFS/086382M Ver. 1

| | Units : | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % | mg/kg | mg/kg |
|-------------------|---------------------------------------------------------------------------------------|-------------------|----------------|---------------|---------------------|---------------|---------------|-------------|---------------|--------------|----------------------|---------------|----------------|--------------|-----------------------|-------------------|---------------------|
| | Method Codes : Method Reporting Limits : | ELESULP 20 | ICPACIDS 20 | ICPMSS 0.5 | ICPMSS 2 | ICPMSS 0.1 | ICPMSS 3 | ICPMSS 3 | ICPMSS 3.5 | 0.10 | ICPMSS 2.5 | ICPMSS 0.5 | ICPMSS 19.5 | ICPSOIL 2 | TMSS 0.2 | TPHFIDUS 10.0 | TPHFIDUS 10.0 |
| | Accreditation Code: | UM | UM | U | UM | U | UM | UM | UM | U | UM | U | UM | U | U | UM | 10.0 |
| TES ID Number CL/ | Client Sample Description | Elemental Sulphur | SO4 (acid sol) | Antimony (MS) | Arsenic (MS) | Cadmium (MS) | Chromium (MS) | Copper (MS) | Lead (MS) | Mercury (MS) | Nickel (MS) | Selenium (MS) | Zinc (MS) | Molybdenum | Tot.Moisture @ 105C | TPH by GCFID (AR) | TPH Carbon Banding. |
| 0829232 | BH102 ES 0.30 | <20 | <20 | <0.5 | 5.2 | 0.21 | 11.5‡ | 10.6 | 22.5 | <0.1 | 16.8 | <0.5 | 49.4 | <1 | 14.7 | <11.7 | Req |
| 0829233 | BH102 ES 1.50 (NVM) | <19‡ | <19‡ | <0.5 | 3.7‡ | <0.1 | 13.5‡ | 4.2‡ | 7.6‡ | <0.1 | 7.8‡ | <0.5 | 18.7‡ | 1 | 13.9 | 27‡ | Req |
| 0829234 | BH104 ES 0.70 | <20 | <20 | <0.5 | 7.3 | 0.25 | 17‡ | 15.1 | 17.7 | <0.1 | 20.4 | <0.5 | 56.4 | 1 | 16.5 | <12.0 | Req |
| 0829235 | BH104 ES 1.50 | <21 | <21 | <0.5 | 5 | 0.14 | 9.4‡ | 8.2 | 9.9 | <0.1 | 14 | <0.5 | 33.9 | <1 | 15.2 | <11.8 | Req |
| 0829236 | BH105 ES 0.70 | <21 | <21 | 0.5 | 5.7 | 0.2 | 14.3‡ | 11.5 | 13.9 | <0.1 | 15.4 | <0.5 | 52.5 | 1 | 14.9 | <11.8 | Req |
| 0829237 | BH106 ES 0.30 | <21 | 215 | 1.2 | 11.6 | 0.8 | 15.3‡ | 34 | 35.1 | 0.12 | 22.5 | 0.5 | 370.6 | <1 | 20.0 | 54 | Req |
| | | | | | | | | | | | | | | | | | |
| | TES Bretby PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD | Client Na | | Soil Me | echanics odroffe | | | | | | Date Prir | | ample / | Analysi | S 21-Oct-08 | | 8 |
| | Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | | | Hirw | aun lı | ndust | rial E | state | | | Report N Table Nu | | | EF | S/086382M 1 | Bre | tby |

| | Units : | pH Units | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % M/M | | | |
|-------------------|--------------------------------------------------------------------------------------------|----------|---------------------|----------|-----------|--------------|-----------------|----------------------|--------------------|---------------------|----------------------|----------------------|--------------------|----------|-----------------------------|-----|-----|
| | Method Codes : | WSLM3 | ICPBOR | ICPMAJ | KONECL | KONECR | PAHSCUV | SEN9 | SFAPI | SFAPI | SFAPI | SFAPI | SFAS | WSLM59 | | | |
| | Method Reporting Limits : | | 0.5 | 1 | 5.0 | 0.1 | 10 | | 0.5 | 0.5 | 0.5 | 2 | 0.5 | 0.02 | | | |
| | Accreditation Code: | U | N | N | N | N | N | N | N | N | N | N | N | N | | | |
| TES ID Number CL/ | Client Sample Description | pH units | Boron (H20 Soluble) | Barium | Chloride: | Chromium vi: | PAH (screening) | Asbestos (screening) | Cyanide(Free) (AR) | Cyanide(Total) (AR) | Phenol Index.(AR) | Thiocyanate(SCN)(AR) | Sulphide as S (AR) | F.O.C. % | | | |
| 0829232 | BH102 ES 0.30 | 8.2 | <0.5 | 77 | 10 | <0.1 | <10 | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.51 | | | |
| 0829233 | BH102 ES 1.50 (NVM) | 8.4 | <0.5 | 16 | 15 | <0.1 | <10 | NBFO | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.16 | | | |
| 0829234 | BH104 ES 0.70 | 8.3 | <0.5 | 158 | 83 | <0.1 | <10 | NBFO | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.79 | | | |
| 0829235 | BH104 ES 1.50 | 8.3 | <0.5 | 72 | 13.3 | <0.1 | <10 | NBFO | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.37 | | | |
| 0829236 | BH105 ES 0.70 | 8.0 | <0.5 | 85 | 12.6 | <0.1 | <11 | NBFO | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.38 | | | |
| 0829237 | BH106 ES 0.30 | 8.2 | <0.5 | 247 | 30 | <0.1 | 31 | NBFO | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 1.79 | | | |
| | | | | | | | | | | | | | | | | | |
| | TES Bretby | Client N | | | chanics | | | | | | | Soils Sa | ample A | Analysis | s | TF | ES |
| | PO Box 100, Bretby Business Park, | Contact | | Mr H Woo | odroffe | | | | | | | | T | | | | |
| | Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | | | Hirw | aun I | ndus | trial E | state | | | Date Pri Report N | Number | | | 21-Oct-08 6/086382M 1 | Bre | tby |
| | Tel +44 (0) 1283 554400 | | | Hirw | aun I | ndus | trial E | state | | | Report N | Number | | | S/086382M | Ві | re |

| | Method Reporting Limits : Accreditation Code: | 10 N | 10 N | 10 N | 20 N | | | | | | | | |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|---------------|---------|-------|--------|-------|-----------------------|----------------|---------|--------------------------|------|
| TES ID Number CL/ | Client Sample Description | Benzene | Toluene | Ethyl Benzene | Xylenes | | | | | | | | |
| 0829232 | BH102 ES 0.30 | <12 | <12 | <12 | <23 | | | | | | | | |
| 0829233 | BH102 ES 1.50 (NVM) | <290 | <290 | <290 | <581 | | | | | | | | |
| 0829234 | BH104 ES 0.70 | <12 | <12 | <12 | <24 | | | | | | | | |
| 0829235 | BH104 ES 1.50 | <12 | <12 | <12 | <24 | | | | | | | | |
| 0829236 | BH105 ES 0.70 | <12 | <12 | <12 | <24 | | | | | | | | |
| 0829237 | BH106 ES 0.30 | <13 | <13 | <13 | <25 | | | | | | | | |
| | TES Bretby PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | Client N Contact | | Mr H Woo | | ndust | rial E | state | Date Prii Report N | nted lumber | ample A | 21-Oct-08 EFS/086382M 1 | etby |

Total Petroleum Hydrocarbons (TPH) Carbon Ranges

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

Job Number: \$08_6382M QC Batch Number: 83540

Directory: D:\TES\DATA\Y2008\1009TPH_GC7\018F2101.D

Method: Ultra Sonic

Accreditation code:

| | | | Concentra | ntion, (mg/kg) - as o | dry weight. | |
|-----------|---------------------|-----------|------------|-----------------------|-------------|------------|
| Sample ID | Client ID | >C8 - C10 | >C10 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 |
| CL0829232 | BH102 ES 0.30 | <2 | <2 | <2 | <2 | <5.13 |
| CL0829233 | BH102 ES 1.50 (NVM) | <2 | <2 | <2 | <2 | 21.4 |
| CL0829234 | BH104 ES 0.70 | <2 | <2 | <2 | 2.42 | <5.25 |
| CL0829235 | BH104 ES 1.50 | <2 | <2 | <2 | <2 | <5.17 |
| CL0829236 | BH105 ES 0.70 | <2 | <2 | <2 | <2 | <5.15 |
| CL0829237 | BH106 ES 0.30 | <3 | <3 | <3 | <3 | 38 |
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Soil

05-Oct-08

08-Oct-08

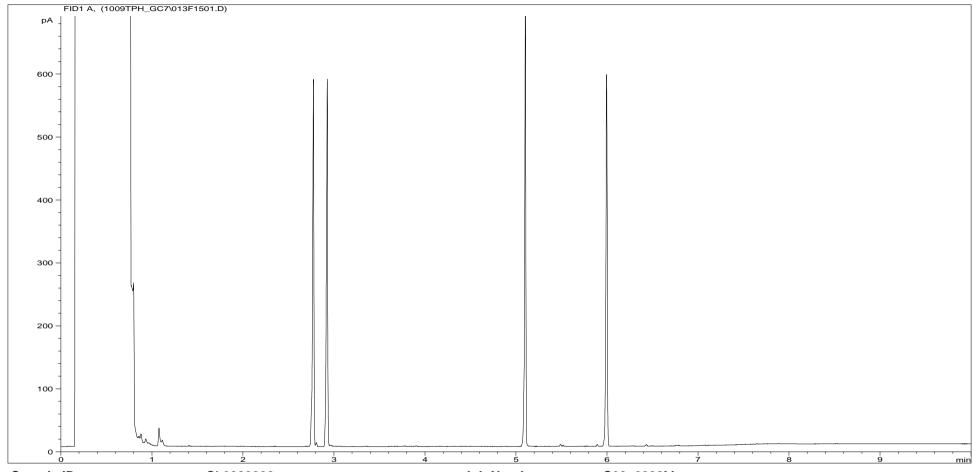
09-Oct-08

Matrix:

Date Booked in:

Date Extracted:

Date Analysed:



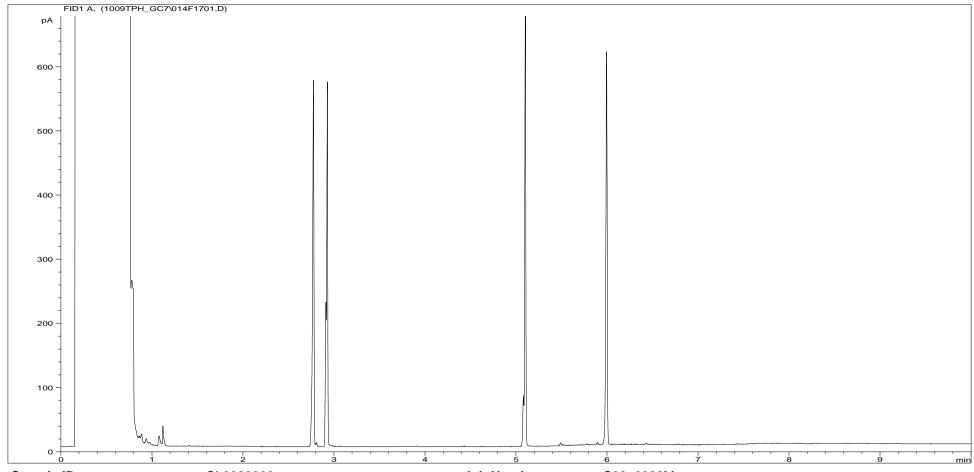
Sample ID:CL0829232Job Number:S08_6382MMultiplier:8Client:Soil Mechanics

Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH102 ES 0.30

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\013F1501.D

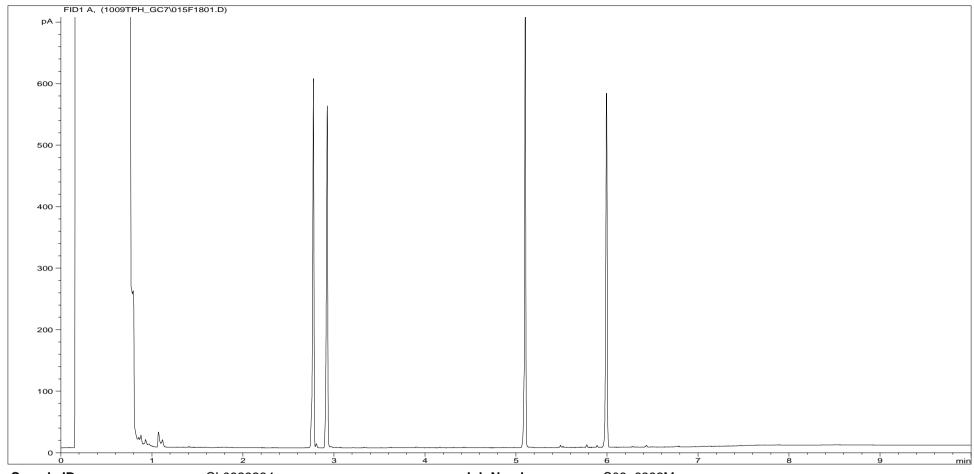


Sample ID:CL0829233Job Number:S08_6382MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial EstateAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:BH102 ES 1.50 (NVM)

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\014F1701.D



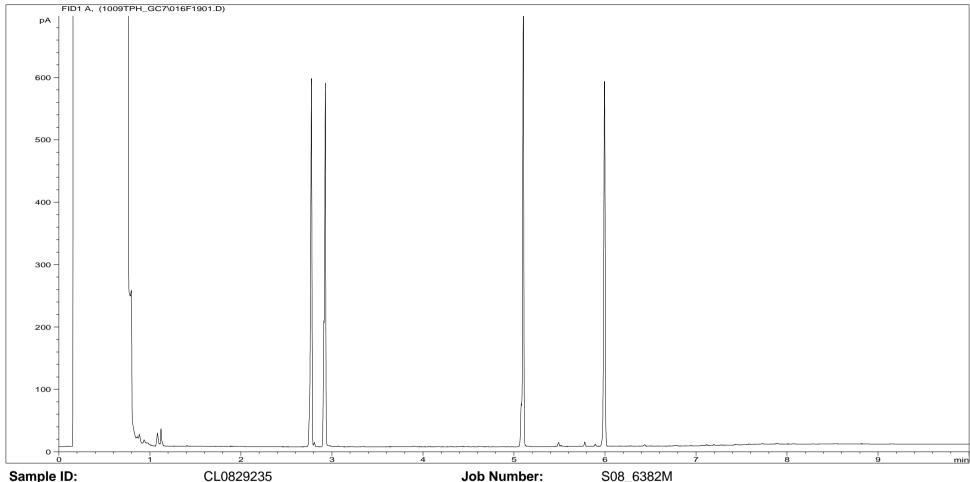
Sample ID:CL0829234Job Number:S08_6382MMultiplier:8Client:Soil Mechanics

Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH104 ES 0.70

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\015F1801.D



Sample ID:CL0829235Job NuMultiplier:8Client:

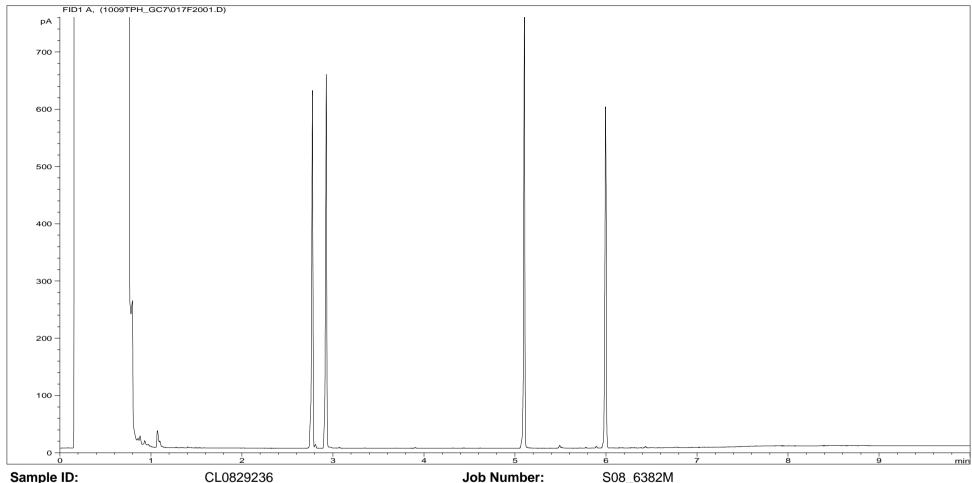
Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH104 ES 1.50

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\016F1901.D

Soil Mechanics



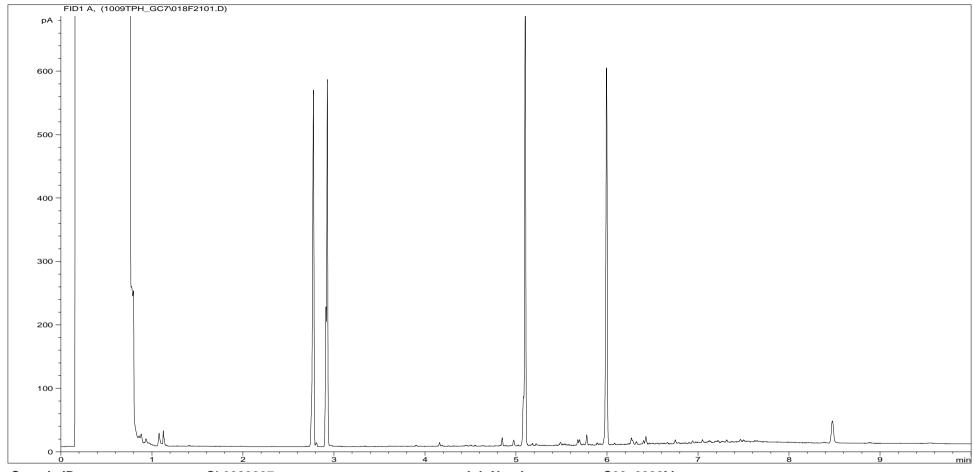
Sample ID: CL Multiplier: 8 Dilution: 1

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH105 ES 0.70

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\017F2001.D



Sample ID:CL0829237Job Number:S08_6382MMultiplier:8Client:Soil Mechanics

Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: BH106 ES 0.30

Acquisition Date/Time: 09-Oct-08

Datafile: D:\TES\DATA\Y2008\1009TPH_GC7\018F2101.D

Report Notes

Soil/Solid analysis specific:

S04 analysis not conducted in accordance with BS1377 unless otherwise stated Water Soluble Sulphate on 2:1 water:soil extract AR denotes analysis conducted on the As Received sample

Water analysis specific:

Results expressed as mg/l unless stated otherwise

Oil analysis specific:

Results expressed as mg/kg unless stated otherwise S.G. expressed as g/cm³@ 15°C

Filter analysis specific:

Results expressed as mg on filter unless stated otherwise

VOC analysis specific:

Explanatory notes for data flagging

U = undetected above reporting limit

J = concentration at instrument was below lowest calibration standard

E = concentration at instrument was above top calibration standard

B = compound was detected in method blank

Gas (Tedlar bag) analysis specific:

Results expressed as ug/l unless stated otherwise

Air (Carbon tube) analysis specific:

Results expressed as ug on tube unless stated otherwise

Asbestos analysis specific:

CH denotes Chrysotile

CR denotes Crocidolite

AM denotes Amosite

NADIS denotes No Asbestos Detected in Sample

NBFO denotes No Bulk fibres Observed

General notes:

^ this analysis was subcontracted to another laboratory

\$ Within laboratory tolerances

\$\$ unable to analyse due to nature of sample

¥ Results for guidance only, possible interference

& Blank corrected

I.S insufficient sample for analysis

Intf Unable to analyse due to interferences

N.D Not determined

N.R Not recorded

N.Det Not detected

Req Analysis Requested, see attached sheets for results

Þ Raised detection limit due to nature of sample

* denotes that all accreditation has been removed by the laboratory for this result.

‡ denotes that Mcerts accreditation has been removed by the laboratory for this result.

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory

may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected.

If you require further details of the circumstances leading to the removal of the accreditation from any data item please do not hesitate to contact the laboratory

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TEST REPORT SOIL SAMPLE ANALYSIS





TES Report No. EFS/085713M (Ver. 1)

Soil Mechanics Unit 15 Crosby Yard Bridgend Mid Glamorgan CF31 1JZ

Site: Hirwaun Industrial Estate

The 11 samples described in this report were logged for analysis by TES Bretby on 05-Sep-2008. The analysis was completed by: 26-Sep-2008

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by TES Bretby Laboratories.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of PCB Congener (12) Results (Page 5)
Table of TPH Texas banding (std) (Page 6)
GC-FID Chromatograms (Pages 7 to 17)
Table of Report Notes (Page 18)

On behalf of TES Bretby:
J Hannah

1. Hanna Project Co-ordinator

Date of Issue: 26-Sep-2008

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS) Tests marked '^' have been subcontracted to another laboratory.

(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.

All results are reported on a dry weight basis at 105°C unless otherwise stated. (except QC samples) TES Bretby accepts no responsibility for any sampling not carried out by our personnel.

Sample Descriptions

Client: Soil Mechanics

Site: Hirwaun Industrial Estate

Report Number: S08_5713M

| Lab ID Number | Client ID | Description |
|---------------|----------------------|--------------------|
| CL/0826248 | TP11 ES 4 2.30 | Brown CLAY |
| CL/0826249 | TP11A ES 2 0.50 | Brown Stone SILT |
| CL/0826250 | TP12 ES 1 0.30 | Brown Stone SILT |
| CL/0826251 | TP12A ES 1 0.20 | Brown MADE GROUND |
| CL/0826252 | TP14 ES 1 0.30 | Brown Stone CLAY |
| CL/0826253 | TP15 ES 1 0.30 | Brown Stone CLAY |
| CL/0826254 | TP15 ES 2 0.70 | Brown Stone CLAY |
| CL/0826255 | TP16 ES 1 0.30 (NVM) | Brown Gravel STONE |
| CL/0826256 | TP16 ES 2 1.00 | Brown Stone CLAY |
| CL/0826257 | TP17 ES 1 0.30 | Brown Stone CLAY |
| CL/0826258 | TP17 ES 3 1.20 | Brown Stone CLAY |
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TES Bretby EFS/085713M Ver. 1

| | Units : | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % | mg/kg | mg/kg |
|-------------------|------------------------------------------------------------------------------------------|-------------------|----------------|---------------|---------------------|--------------|---------------|-------------|-----------|--------------|-----------------|-------------|---------------|------------|-----------------------------|-------------------|---------------------|
| | Method Codes: | ELESULP | ICPACIDS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | ICPMSS | TMSS | TPHFIDUS | |
| | Method Reporting Limits : Accreditation Code: | 20 UM | 20 UM | 0.1 U | 2 UM | 0.1 U | 3 UM | 3 UM | 3.5 UM | 0.10 U | 0.5 U | 2.5 UM | 0.5 U | 19.5 UM | 0.2 U | 10.0 UM | 10.0 |
| TES ID Number CL/ | Client Sample Description | Elemental Sulphur | SO4 (acid sol) | Antimony (MS) | Arsenic (MS) | Cadmium (MS) | Chromium (MS) | Copper (MS) | Lead (MS) | Mercury (MS) | Molybdenum (MS) | Nickel (MS) | Selenium (MS) | Zinc (MS) | Tot.Moisture @ 105C | TPH by GCFID (AR) | TPH Carbon Banding. |
| 0826249 | TP11A ES 2 0.50 | <21 | 273 | <0.5 | 7.9 | 0.14 | 12.0‡ | 16 | 21.2 | <0.1 | <0.5 | 19 | <0.5 | 57.7 | 12.7 | <11.5 | Req |
| 0826248 | TP11 ES 4 2.30 | <20 | 348 | <0.5 | 5.3 | 0.14 | 16.4‡ | 12.9 | 19.7 | <0.1 | <0.5 | 22 | <0.5 | 65.4 | 16.0 | <11.9 | Req |
| 0826251 | TP12A ES 1 0.20 | <20 | 485 | 0.5 | 13.9 | 0.43 | 12.9‡ | 26.5 | 34.3 | <0.1 | <0.5 | 21 | 0.6 | 212.4 | 18.0 | 61 | Req |
| 0826250 | TP12 ES 1 0.30 | <21 | 82 | <0.5 | 5.4 | <0.1 | 12.1‡ | 12.7 | 46.9 | <0.1 | <0.5 | 22.1 | <0.5 | 54.1 | 11.6 | <11.3 | Req |
| 0826252 | TP14 ES 1 0.30 | <20 | 387 | <0.5 | 10.1 | 0.37 | 15.1‡ | 20.8 | 28.5 | <0.1 | <0.5 | 17 | <0.5 | 97.9 | 20.7 | 63 | Req |
| 0826253 | TP15 ES 1 0.30 | 61 | 849 | <0.5 | 8.5 | 0.32 | 15.3‡ | 20.4 | 25.3 | <0.1 | <0.5 | 15.6 | 0.5 | 92.1 | 21.5 | <12.7 | Req |
| 0826254 | TP15 ES 2 0.70 | <21 | 1540 | 1.2 | 7.6 | 0.76 | 15.7‡ | 20 | 52 | <0.1 | 0.6 | 12.8 | <0.5 | 73.9 | 19.0 | 114 | Req |
| 0826255 | TP16 ES 1 0.30 (NVM) | 306‡ | 1740‡ | <0.5 | 9.4‡ | 0.2 | 22.5‡ | 13.3‡ | 54‡ | <0.1 | <0.5 | 11.7‡ | 1.4 | 34.6‡ | 16.6 | <12.0‡ | Req |
| 0826256 | TP16 ES 2 1.00 | <21 | 408 | <0.5 | 8 | 0.12 | 15.5‡ | 19.7 | 21.2 | <0.1 | <0.5 | 28.2 | <0.5 | 58.6 | 17.9 | 12.2 | Req |
| 0826257 | TP17 ES 1 0.30 | <21 | 274 | <0.5 | 11.2 | 0.2 | 14‡ | 19.1 | 23.6 | <0.1 | <0.5 | 19.6 | <0.5 | 57.9 | 20.9 | 16.4 | Req |
| 0826258 | TP17 ES 3 1.20 | <21 | 609 | <0.5 | 11.2 | 0.2 | 13.4‡ | 17.1 | 27 | <0.1 | <0.5 | 17.2 | 0.8 | 40.1 | 21.8 | 50 | Req |
| | | | | | | | | | | | | | | | | | |
| | TES Bretby PO Box 100, Bretby Business Park, | Client N | | Soil Me | echanics odroffe | 1 | 1 | 1 | 1 | 1 | | | ample / | Analysis | | - | ES |
| | Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | | | Hirw | aun I | ndust | rial E | state | | | Date Prin | lumber | | | 26-Sep-08 6/085713M 1 | Bre | etby |

| | Units : | pH Units | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | æg/kg | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % M/M | | |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------|----------|-----------|--------------|-----------------|--------------------|----------------------|--------------------|-----------------------|-------------------|----------------------|--------------------|------------------------|-----------|--------------|
| | Method Codes : | WSLM3 | ICPBOR | ICPMAJ | KONECL | KONECR | | PCBUSECD | SEN9 | SFAPI | SFAPI | SFAPI | SFAPI | SFAS | WSLM59 | | <u> </u> |
| | Method Reporting Limits : Accreditation Code: | U | 0.5 N | 1 N | 5.0 N | 0.1 N | 10 N | | N | 0.5 N | 0.5 N | 0.5 N | 2 N | 0.5 N | 0.02 N | | |
| TES ID Number CL/ | Client Sample Description | pH units | Boron (H20 Soluble) | Barium | Chloride: | Chromium vi: | PAH (screening) | PCB (12 Congeners) | Asbestos (screening) | Cyanide(Free) (AR) | Cyanide(Total) (AR) | Phenol Index.(AR) | Thiocyanate(SCN)(AR) | Sulphide as S (AR) | F.O.C. % | | |
| 0826249 | TP11A ES 2 0.50 | 7.7 | <0.5 | <0.1 | 14.4 | <0.1 | <10 | | | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.32 | | |
| 0826248 | TP11 ES 4 2.30 | 8.3 | 0.7 | 225 | 101 | <0.1 | 16 | Req | NBFO | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.54 | | |
| 0826251 | TP12A ES 1 0.20 | 8.0 | 0.6 | 141 | 22 | <0.1 | 16 | | NBFO | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 2.28 | | |
| 0826250 | TP12 ES 1 0.30 | 7.3 | <0.5 | <0.1 | 14.5 | <0.1 | <10 | | | <0.6 | <0.6 | <0.6 | <2.3 | <0.6 | 0.25 | | |
| 0826252 | TP14 ES 1 0.30 | 7.7 | <0.5 | 140 | 15.2 | <0.1 | 20 | | NBFO | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 2.51 | | |
| 0826253 | TP15 ES 1 0.30 | 9.5 | 0.6 | 334 | 36 | <0.1 | 30 | Req | NBFO | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 1.77 | | |
| 0826254 | TP15 ES 2 0.70 | 8.3 | 0.5 | 198 | 20 | <0.1 | 23 | | NBFO | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 3.07 | | |
| 0826255 | TP16 ES 1 0.30 (NVM) | 10.1 | 2.3 | 420 | 102 | <0.1 | 123 | | NBFO | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 3.16 | | |
| 0826256 | TP16 ES 2 1.00 | 7.5 | <0.5 | 169 | 40 | <0.1 | 12 | | | <0.6 | <0.6 | <0.6 | <2.4 | <0.6 | 0.49 | | |
| 0826257 | TP17 ES 1 0.30 | 7.8 | <0.5 | 76 | 22 | <0.1 | 12 | | NBFO | <0.6 | <0.6 | <0.6 | <2.5 | <0.6 | 1.56 | | <u> </u> |
| 0826258 | TP17 ES 3 1.20 | 7.6 | <0.5 | 192 | 27 | <0.1 | 12 | | NBFO | <0.6 | <0.6 | <0.6 | <2.6 | <0.6 | 2.11 | | |
| | | | | | | | | | | | | | | | | | |
| | TES Bretby PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | Client Na | | Mr H Woo | | ndust | trial E | state | | | Date Prii Report N | nted lumber | ample / | - | 26-Sep-08 5/085713M | TE Bre | S tby |

| | Units : | ug/kg | ug/kg | ug/kg | ug/kg | | | | | | T | | | |
|-------------------|------------------------------------------------------------------|----------|---------|---------------|---------|--------|--------|-------|----------|---------|----------|---------------------------------|-----|----------------------------------------------|
| | Method Codes : | BTEXHSA | BTEXHSA | BTEXHSA | BTEXHSA | | | | | | | | | |
| | Method Reporting Limits : | 10 | 10 | 10 | 20 | | | | | | | | | |
| | Accreditation Code: | N | N | N | N | | | | | | | | | |
| TES ID Number CL/ | Client Sample Description | Benzene | Toluene | Ethyl Benzene | Xylenes | | | | | | | | | |
| 0826249 | TP11A ES 2 0.50 | <11 | <11 | <11 | <23 | | | | | | | | | |
| 0826249 | TP11 ES 4 2.30 | <12 | <12 | <12 | <24 | | | | | | | | | |
| 0826251 | TP12A ES 1 0.20 | <12 | <12 | <12 | <24 | | | | | | | | | |
| 0826251 | TP12 ES 1 0.30 | <12 | <12 | <12 | <23 | | | | | | | | | |
| | TP14 ES 1 0.30 | | | | | | | | | | | | | |
| 0826252 | | <32 | <32 | <32 | <63 | | | | | | | | | |
| 0826253 | TP15 ES 1 0.30 | <13 | <13 | <13 | <25 | | | | | | | | | |
| 0826254 | TP15 ES 2 0.70 | <12 | <12 | <12 | <25 | | | | | | | | | |
| 0826255 | TP16 ES 1 0.30 (NVM) | <12 | <12 | <12 | <24 | | | | | | | | | |
| 0826256 | TP16 ES 2 1.00 | <12 | <12 | <12 | <24 | | | | | | | | | |
| 0826257 | TP17 ES 1 0.30 | <32 | <32 | <32 | <63 | | | | | | | | | |
| 0826258 | TP17 ES 3 1.20 | <13 | <13 | <13 | <26 | | | | | | | | | |
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| | TES Bretby | Client N | lame | Soil Me | chanics | | | | | Soils S | ample A | Analysis | T | ES |
| | PO Box 100, Bretby Business Park, | Contact | : | Mr H Woo | odroffe | | | | | | | | | <u>- </u> |
| | Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 | | | | _ | | | | Date Pri | | | 26-Sep-08 EFS/085713M | Bre | etby |
| | Fax +44 (0) 1283 554422 | | | Hirw | aun li | ndustr | ial Es | state | Table Nu | | | 1 | | |
| | | <u> </u> | | | | | | | | | <u> </u> | | | |

Polychlorinated Biphenyls (congeners)

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

 Job Number:
 \$08_5713M

 QC Batch Number:
 083204

Directory: 0910PCB.GC11
Method: Ultrasonic

Accreditation code:

| | | | | | · | Conce | ntration, | (µg/kg) | | · | | · | |
|-----------|----------------|--------|--------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|
| Sample ID | Customer ID | PCB 81 | PCB 77 | PCB 123 | PCB 118 | PCB 114 | | | PCB 167 | PCB 156 | PCB 157 | PCB 169 | PCB 189 |
| CL0826248 | TP11 ES 4 2.30 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 | <4.9 |
| CL0826253 | TP15 ES 1 0.30 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 | <5.2 |
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Soil

05-Sep-08

09-Sep-08

10-Sep-08

Matrix:

Date Booked in:

Date Extracted:

Date Analysed:

Total Petroleum Hydrocarbons (TPH) Carbon Ranges

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

Job Number: S08_5713M

QC Batch Number: 83209

Directory: D:\TES\DATA\Y2008\0910TPH_GC7\074B2501.D

Method: Ultra Sonic

Accreditation code: U

| | | | Concentra | ntion, (mg/kg) - as o | dry weight. | |
|-----------|----------------------|-----------|------------|-----------------------|-------------|------------|
| Sample ID | Client ID | >C8 - C10 | >C10 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 |
| CL0826248 | TP11 ES 4 2.30 | <2 | <2 | <2 | <2 | <5.21 |
| CL0826249 | TP11A ES 2 0.50 | <2 | <2 | 3.06 | <2 | <5.02 |
| CL0826250 | TP12 ES 1 0.30 | <2 | <2 | 2.64 | <2 | <4.95 |
| CL0826251 | TP12A ES 1 0.20 | <2 | <2 | 2 | <2 | 37.2 |
| CL0826252 | TP14 ES 1 0.30 | <3 | <3 | <3 | 2.62 | 37.6 |
| CL0826253 | TP15 ES 1 0.30 | <3 | <3 | 3.03 | <3 | <5.58 |
| CL0826254 | TP15 ES 2 0.70 | <2 | <2 | 4.51 | <2 | 65.8 |
| CL0826255 | TP16 ES 1 0.30 (NVM) | <2 | <2 | 2.43 | <2 | 6.87 |
| CL0826256 | TP16 ES 2 1.00 | <2 | <2 | 3.23 | <2 | 6.59 |
| CL0826257 | TP17 ES 1 0.30 | <3 | <3 | 3.11 | <3 | 7.37 |
| CL0826258 | TP17 ES 3 1.20 | <3 | <3 | <3 | <3 | 26.7 |
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Soil

05-Sep-08

09-Sep-08

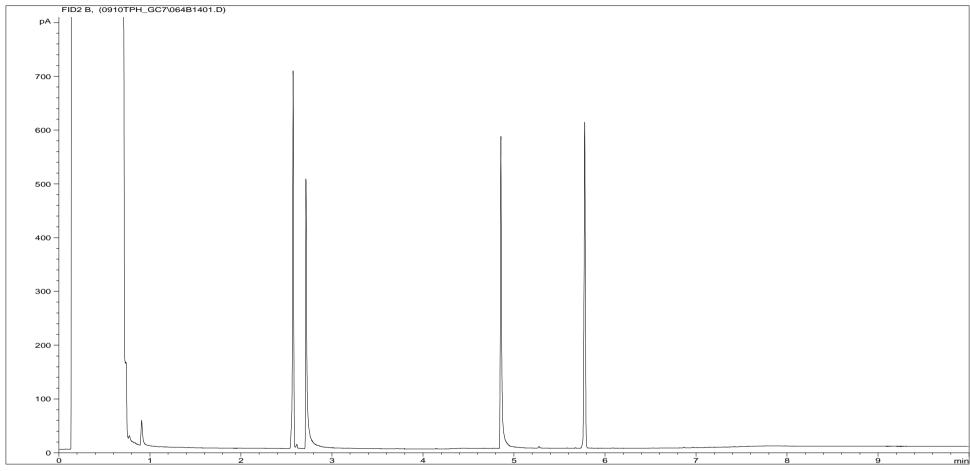
10-Sep-08

Matrix:

Date Booked in:

Date Extracted:

Date Analysed:



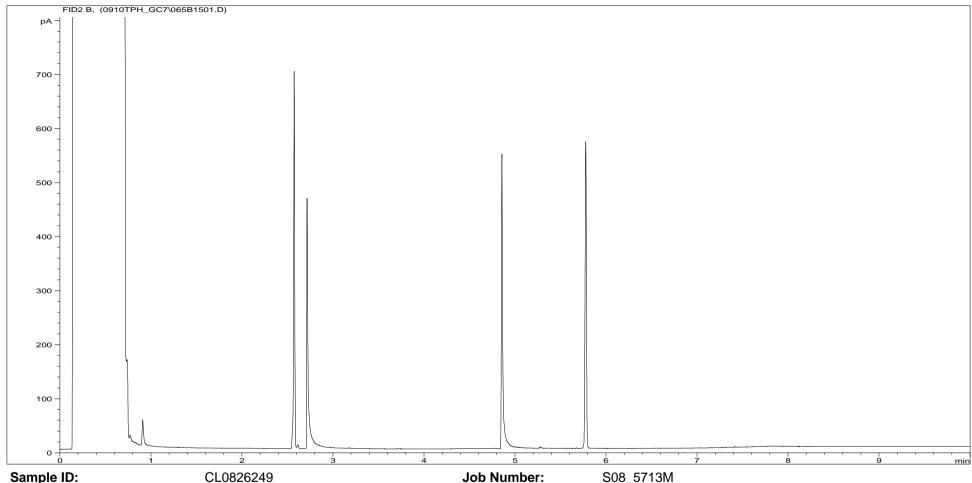
Sample ID:CL0826248Job Number:S08_5713MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP11 ES 4 2.30

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\064B1401.D



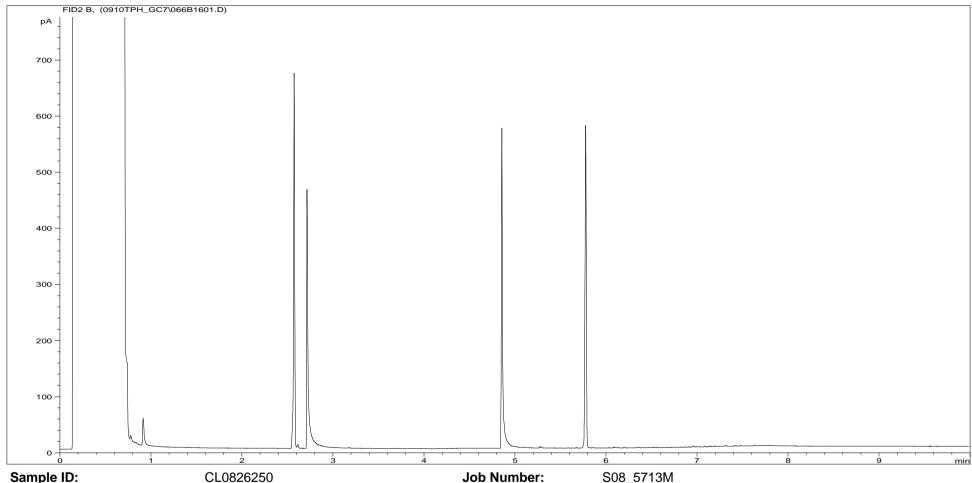
Sample ID: CL08
Multiplier: 8

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Dilution:1Site:Hirwaun Industrial EstaAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:TP11A ES 2 0.50

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\065B1501.D



Sample ID: CL0826250 Multiplier: 8 Dilution:

Client: Soil Mechanics Site:

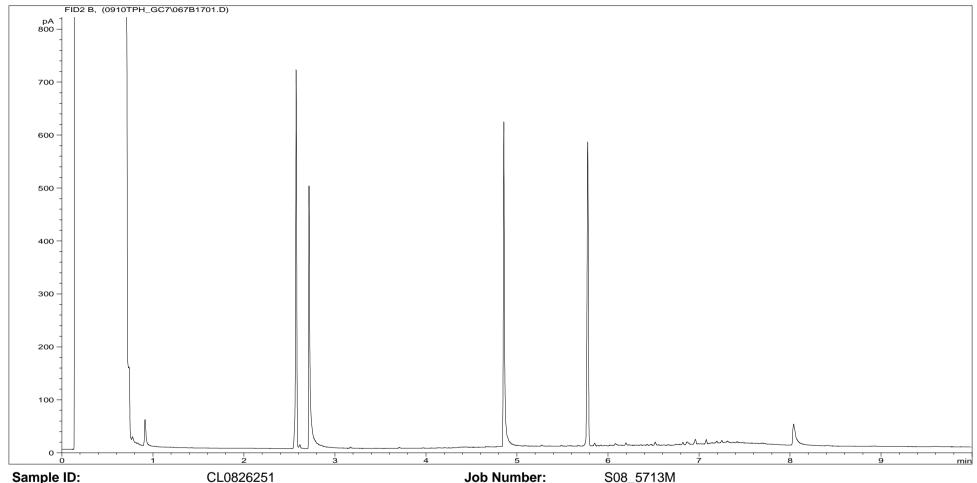
Acquisition Method: 5UL_RUNFNORACE.M

Hirwaun Industrial Estate TP12 ES 1 0.30

Client Sample Ref:

Acquisition Date/Time: 10-Sep-08

D:\TES\DATA\Y2008\0910TPH_GC7\066B1601.D Datafile:



Sample ID: C
Multiplier: 8

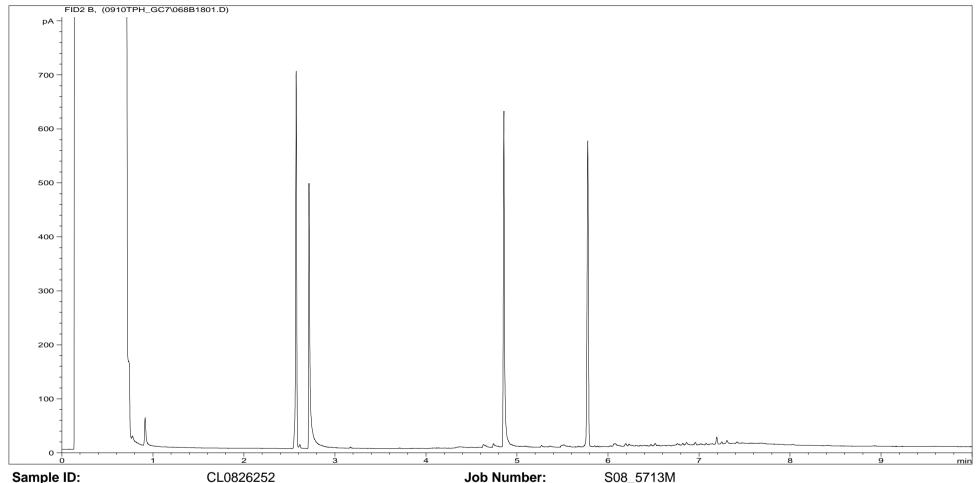
Client: Soil Mechanics
Site: Hirwaun Industr

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP12A ES 1 0.20

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\067B1701.D



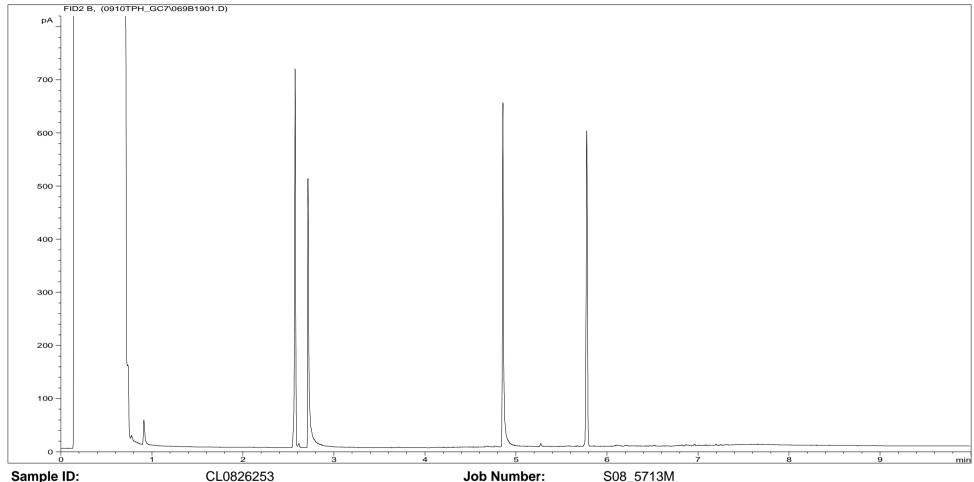
Sample ID: C
Multiplier: 8
Dilution: 1

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP14 ES 1 0.30

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\068B1801.D



Sample ID:CL0826253Job Number:Multiplier:8Client:

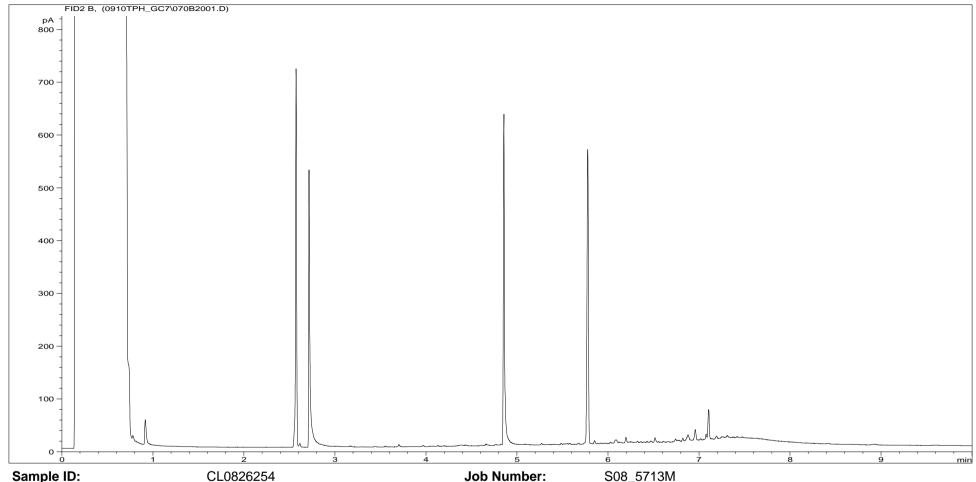
Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP15 ES 1 0.30

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\069B1901.D

Soil Mechanics



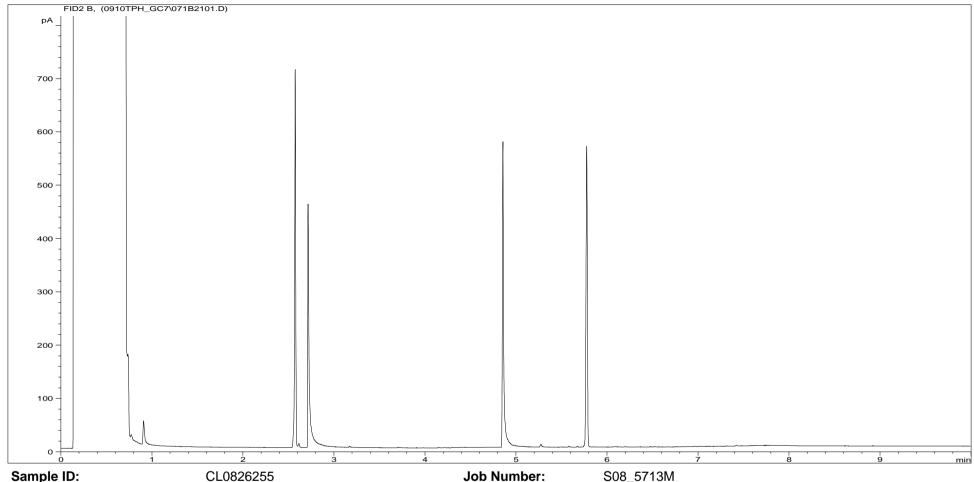
Sample ID: CI Multiplier: 8 Dilution: 1

8 Client: Soil Mechanics
1 Site: Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP15 ES 2 0.70

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\070B2001.D

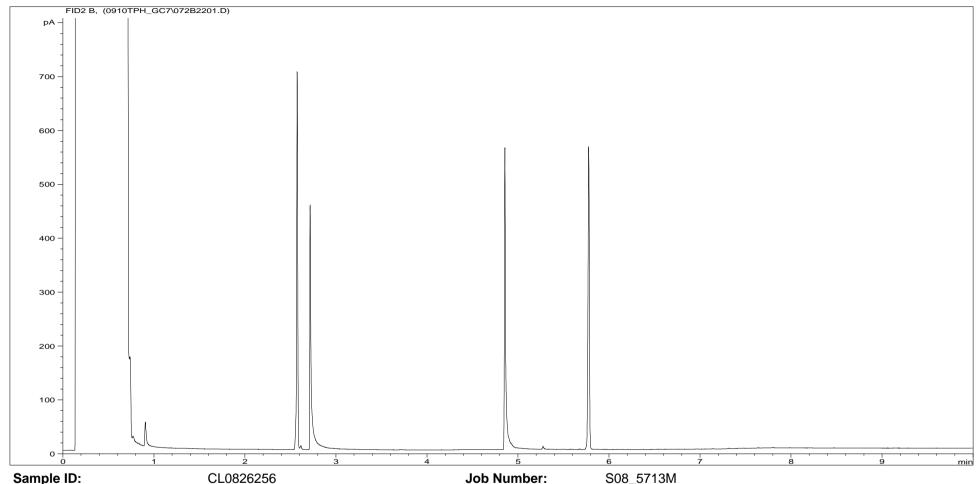


Sample ID:CL0826255Job Number:S08_5713MMultiplier:8Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial EstateAcquisition Method:5UL_RUNFNORACE.MClient Sample Ref:TP16 ES 1 0.30 (NVM)

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\071B2101.D



Sample ID: CL0
Multiplier: 8
Dilution: 1

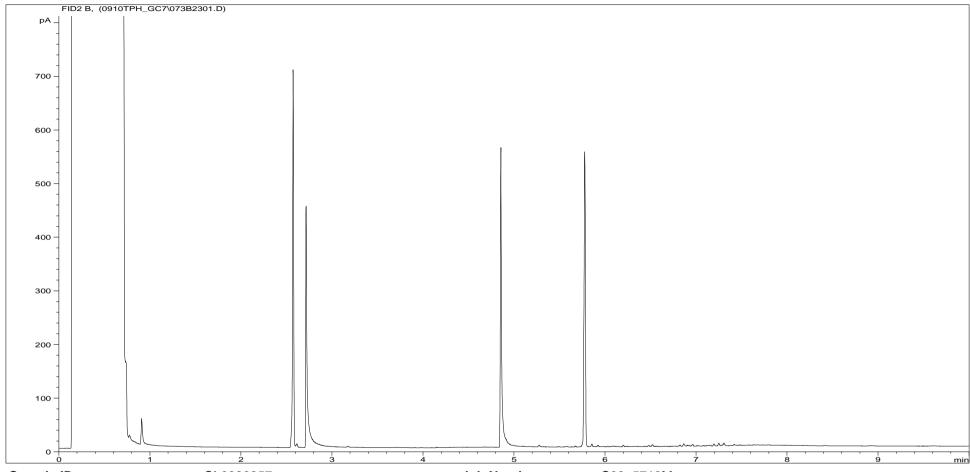
Client: Soil Mechanics
Site: Hirwaun Industrial Estate

i. Site. Missauli III DUNENODACE M. Client Comple Def: TD4C EC 24.00

Acquisition Method: 5UL_RUNFNORACE.M Client Sample Ref: TP16 ES 2 1.00

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\072B2201.D



Sample ID: CL0826257 Multiplier: 8 Dilution:

Job Number: S08 5713M Client: Soil Mechanics

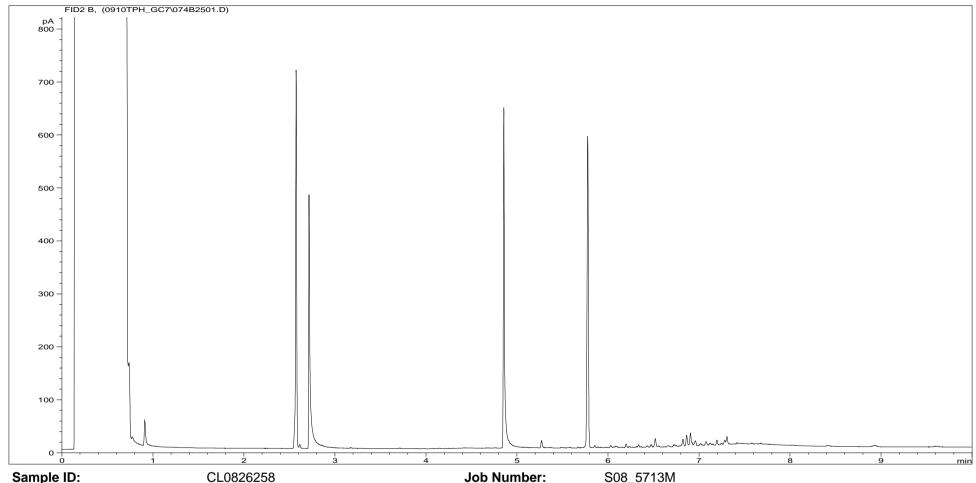
Acquisition Method: 5UL_RUNFNORACE.M

Hirwaun Industrial Estate Site:

Client Sample Ref: TP17 ES 1 0.30

Acquisition Date/Time: 10-Sep-08

D:\TES\DATA\Y2008\0910TPH_GC7\073B2301.D Datafile:



Sample ID: C
Multiplier: 8

Client: Soil Mechanics
Site: Hirwaun Industrial Estate

Dilution: 1 Site: Hirwaun Industrial Es

Acquisition Method:5UL_RUNFNORACE.MClient Sample Ref:TP17 ES 3 1.20

Acquisition Date/Time: 10-Sep-08

Datafile: D:\TES\DATA\Y2008\0910TPH_GC7\074B2501.D

Report Notes

Soil/Solid analysis specific:

S04 analysis not conducted in accordance with BS1377 unless otherwise stated Water Soluble Sulphate on 2:1 water:soil extract AR denotes analysis conducted on the As Received sample

Water analysis specific:

Results expressed as mg/l unless stated otherwise

Oil analysis specific:

Results expressed as mg/kg unless stated otherwise S.G. expressed as g/cm³@ 15°C

Filter analysis specific:

Results expressed as mg on filter unless stated otherwise

VOC analysis specific:

Explanatory notes for data flagging

U = undetected above reporting limit

J = concentration at instrument was below lowest calibration standard

E = concentration at instrument was above top calibration standard

B = compound was detected in method blank

Gas (Tedlar bag) analysis specific:

Results expressed as ug/l unless stated otherwise

Air (Carbon tube) analysis specific:

Results expressed as ug on tube unless stated otherwise

Asbestos analysis specific:

CH denotes Chrysotile

CR denotes Crocidolite

AM denotes Amosite

NADIS denotes No Asbestos Detected in Sample

NBFO denotes No Bulk fibres Observed

General notes:

^ this analysis was subcontracted to another laboratory

\$ Within laboratory tolerances

\$\$ unable to analyse due to nature of sample

¥ Results for guidance only, possible interference

& Blank corrected

I.S insufficient sample for analysis

Intf Unable to analyse due to interferences

N.D Not determined

N.R Not recorded

N.Det Not detected

Req Analysis Requested, see attached sheets for results

Þ Raised detection limit due to nature of sample

* denotes that all accreditation has been removed by the laboratory for this result.

‡ denotes that Mcerts accreditation has been removed by the laboratory for this result.

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory

may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected.

If you require further details of the circumstances leading to the removal of the accreditation from any data item please do not hesitate to contact the laboratory

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TEST REPORT WATER SAMPLE ANALYSIS



TES Report No. EXR/088900 (Ver. 1)

Soil Mechanics Unit 15 Crosby Yard Wildmill Bridgend Mid Glamorgan CF31 1JZ

Site: Hirwaun Industrial Estate

The 5 samples described in this report were logged for analysis by TES Bretby on 14-Oct-2008. The analysis was completed by: 30-Oct-2008

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by TES Bretby Laboratories.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of PAH (MS-SIM) (10) Results (Pages 5 to 9)
GC-FID Chromatograms (Pages 10 to 14)
Table of Report Notes (Page 15)

On behalf of TES Bretby:
John Elstub

Project Co-ordinator

Date of Issue: 30-Oct-2008

Tests marked 'A' have been subcontracted to another laboratory.

TES Bretby accepts no responsibility for any sampling not carried out by our personnel.

| | Units : | | uS/cm | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l |
|------------------|------------------------------------------------------------------------------------------|----------|--------------------------|------------------|--------------------|--------------------------------|--------------------------|----------------------------|---------------------------|--------------------------|------------------------|----------------------------------------------------------------|---------------------------|--------------------------|---------------------------|----------------------------|------------------------------|
| | Method Codes : | WSLM3 | WSLM2 | KONENS | ISEF | CPWATVA | | ICPMSW | ICPMSW | ICPMSW | ICPMSW | ICPMSW | ICPMSW | CPWATVAR | | ICPMSW | ICPMSW |
| | Method Reporting Limits : UKAS Accredited : | yes | 100 yes | 1 yes | 0.1 yes | 3.0 yes | 0.001 yes | 0.001 yes | 0.0001 yes | 0.001 yes | 0.001 yes | 0.002 | 0.001 yes | 0.01 yes | 0.0001 | 0.001 yes | 0.001 yes |
| | UKAS Accredited : | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| TES ID Number EX | Client Sample Description | pH units | Conductivity uS/cm @ 25C | Chloride as Cl w | Fluoride as F | Total Sulphur as SO4 (Total) a | Nickel as Ni (Dissolved) | Chromium as Cr (Dissolved) | Cadmium as Cd (Dissolved) | Copper as Cu (Dissolved) | Lead as Pb (Dissolved) | Zinc as Zn (Dissolved) | Arsenic as As (Dissolved) | Boron as B (Dissolved) a | Mercury as Hg (Dissolved) | Selenium as Se (Dissolved) | Molybdenum as Mo (Dissolved) |
| 0835481 | BH101 W | 6.6 | 670 | 27 | 0.3 | 21.0 | 0.015 | 0.005 | 0.0003 | 0.006 | 0.002 | 0.095 | 0.014 | 0.08 | 0.0001 | 0.004 | 0.004 |
| 0835482 | BH103 W | 7.2 | 362 | 7 | 0.2 | 22.0 | 0.005 | 0.004 | 0.0002 | 0.004 | 0.003 | 0.066 | 0.002 | 0.03 | <0.0001 | 0.001 | 0.001 |
| 0835483 | BH105 W | 7.2 | 377 | 7 | 0.2 | 16.0 | 0.003 | 0.004 | 0.0001 | 0.003 | 0.003 | 0.067 | 0.003 | 0.04 | <0.0001 | 0.001 | 0.001 |
| 0835484 | BH106 W | 6.8 | 281 | 9 | 0.2 | 11.0 | 0.004 | 0.002 | 0.0002 | 0.002 | 0.001 | 0.037 | <0.001 | 0.03 | <0.0001 | <0.001 | <0.001 |
| 0835485 | BH109 W | 7.5 | 651 | 25 | 4.2 | 32.0 | 0.002 | 0.003 | <0.0001 | <0.001 | <0.001 | 0.019 | 0.003 | 0.04 | <0.0001 | <0.001 | 0.005 |
| | | | | | | | | | | | | | | | | | |
| | TES Bretby PO Box 100, Bretby Business Park, | Client N | | Soil Me | chanics odroffe | | | | | | | | ample | Analysi | | | S |
| | Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | | | Hirw | aun I | ndust | trial E | state | | | Report N | Date Printed 30-Oct-08 Report Number EXR/088900 Table Number 1 | | | | etby | |

| | Units : | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | ug/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|-------------------|----------------------|------------------------|----------------------|----------------------------|-----------------|--------------------|----------------------|-----------------------|---------------------------|------------------------|----------------|--|
| | Method Paperting Limits: | 0.001 | KONENS | KONENS 0.01 | 0.2 | WSLM11 | | CPWATVAF | | SFAPI 0.1 | SFAPI 0.02 | SFAPI 0.02 | WSLM20 2 | SFAPI 0.05 | TPHFID 0.01 | |
| | Method Reporting Limits : UKAS Accredited : | yes | 0.01 yes | yes | ves | 5 yes | 0.1 yes | 0.01 no | 0.01 no | no | no | no | no | 0.05 no | no | |
| TES ID Number EX | Client Sample Description | Antimony as Sb (Dissolved) | Ammoniacal Nitrogen as N | Chromium VI as Cr | Sulphide (Free) as S | Chemical Oxygen Demand | Total Organic Carbon | Barium as Ba (Dissolved) a | PAH MS-SIM (16) | Thiocyanate as SCN | Cyanide (Free) as CN | Cyanide (Total) as CN | Biochemical Oxygen Demand | Phenol Index as C6H5OH | TPH GC (0.01) | |
| 0835481 | BH101 W | <0.001 | 11.5 | <0.01 | 0.5 | 80 | 24 | 0.30 | Req | <0.20 | <0.02 | <0.02 | 13 | <0.05 | 0.04 | |
| 0835482 | BH103 W | <0.001 | 1.0 | <0.01 | <0.2 | 17 | 4.2 | 0.28 | Req | <0.20 | <0.02 | <0.02 | <2.0 | <0.05 | 0.02 | |
| 0835483 | BH105 W | <0.001 | 0.5 | <0.01 | <0.2 | 34 | 4.7 | 0.26 | Req | <0.20 | <0.02 | <0.02 | <2.0 | <0.05 | 0.03 | |
| 0835484 | BH106 W | <0.001 | 0.19 | <0.01 | <0.2 | 10 | 4.0 | 0.18 | Req | <0.20 | <0.02 | <0.02 | 2.5 | <0.05 | <0.01 | |
| 0835485 | BH109 W | <0.001 | 0.5 | <0.01 | 1.5 | 25 | 8.7 | 0.18 | Req | <0.20 | <0.02 | <0.02 | <2.0 | <0.05 | 0.14 | |
| | TES Bretby PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | Date Printed 30-Oct-08 | | | | | | TES Bretby | | | | | | | | |

| | Units : | // | /1 | /! | /1 | | | | | |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|---------------------------------------------------------------------------------------------------|---------|--|--|--|-------------------------------------------|-------------------|
| | Method Codes : | ug/l BTEYHSA | ug/l | ug/l BTEXHSA | ug/l | | | | | |
| | Method Reporting Limits : | 5 | 5 | 5 | 10 | | | | | |
| | UKAS Accredited : | no | no | no | no | | | | | |
| TES ID Number EX | Client Sample Description | Benzene | Toluene | Ethyl Benzene | Xylenes | | | | | |
| 0835481 | BH101 W | <5 | <5 | <5 | <10 | | | | | |
| 0835482 | BH103 W | <5 | <5 | <5 | <10 | | | | | |
| 0835483 | BH105 W | <5 | <5 | <5 | <10 | | | | | |
| 0835484 | BH106 W | <5 | <5 | <5 | <10 | | | | | |
| 0835485 | BH109 W | 9 | <5 | <5 | <10 | | | | | |
| | | | | | | | | | | |
| | TES Bretby PO Box 100, Bretby Business Park, Burton-on-Trent, Staffordshire, DE15 0XD Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422 | Client N Contact | | Soil Mechanics Mr H Woodroffe Hirwaun Industrial Estate Date Printed Report Number Table Number | | | | | Sample Analysis 30-Oct-08 EXR/088900 1 | TES Bretby |

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

BH101 W Sample Details: Job Number: W08_8900 LIMS ID Number: EX0835481 Date Booked in: 14-Oct-08 **QC Batch Number:** 923 **Date Extracted:** 23-Oct-08 **Quantitation File: Initial Calibration Date Analysed:** 24-Oct-08 **Directory:** 023PAH_MS14\ Matrix: Water **Dilution:** 2.5 **Ext Method:** Sep. Funnel

UKAS accredited?: No

| Target Compounds | CAS# | R.T. | Concentration | % Fit |
|------------------------|----------|-------|---------------|-------|
| | | (min) | ug/l | |
| Naphthalene | 91-20-3 | 3.48 | 0.065 | 82 |
| Acenaphthylene | 208-96-8 | - | < 0.010 | - |
| Acenaphthene | 83-32-9 | 4.66 | 0.012 | 51 |
| Fluorene | 86-73-7 | - | < 0.010 | - |
| Phenanthrene | 85-01-8 | 5.90 | 0.035 | 86 |
| Anthracene | 120-12-7 | 5.95 | 0.010 | 84 |
| Fluoranthene | 206-44-0 | 7.27 | 0.071 | 99 |
| Pyrene | 129-00-0 | 7.55 | 0.061 | 99 |
| Benzo[a]anthracene | 56-55-3 | 9.23 | 0.032 | 97 |
| Chrysene | 218-01-9 | 9.29 | 0.032 | 97 |
| Benzo[b]fluoranthene | 205-99-2 | 10.78 | 0.020 | M |
| Benzo[k]fluoranthene | 207-08-9 | 10.80 | 0.024 | M |
| Benzo[a]pyrene | 50-32-8 | 11.20 | 0.021 | 86 |
| Indeno[1,2,3-cd]pyrene | 193-39-5 | 12.59 | 0.010 | 98 |
| Dibenzo[a,h]anthracene | 53-70-3 | - | < 0.010 | - |
| Benzo[g,h,i]perylene | 191-24-2 | - | < 0.010 | - |
| Total (USEPA16) PAHs | - | - | < 0.433 | - |

"M" denotes that % fit has been manually interpreted

| Internal Standards | % Area |
|------------------------|--------|
| 1,4-Dichlorobenzene-d4 | NA |
| Naphthalene-d8 | 76 |
| Acenaphthene-d10 | 72 |
| Phenanthrene-d10 | 69 |
| Chrysene-d12 | 69 |
| Perylene-d12 | 69 |

| Surrogates | % Rec |
|------------------|-------|
| Nitrobenzene-d5 | N.D |
| 2-Fluorobiphenyl | 57 |
| Terphenyl-d14 | 98 |

Customer an Soil Mechanics: Hirwaun Industrial Estate

Sample Deta BH103 WJob Number:W08_8900LIMS ID Num EX0835482Date Booked in:14-Oct-08QC Batch Nu 923Date Extracted:23-Oct-08Quantitation Initial CalibrationDate Analysed:24-Oct-08Directory:023PAH_MS14\Matrix:Water

Dilution: 2.5 **Ext Method:** Sep. Funnel

UKAS accredited?: No

| Target Compo | CAS# | R.T. | Concentration | % Fit |
|----------------|----------|-------|---------------|-------|
| | | (min) | ug/l | |
| Naphthalene | 91-20-3 | 3.48 | 0.010 | 95 |
| Acenaphthyle | 208-96-8 | - | < 0.010 | - |
| Acenaphthene | 83-32-9 | - | < 0.010 | - |
| Fluorene | 86-73-7 | - | < 0.010 | - |
| Phenanthrene | 85-01-8 | 5.90 | 0.017 | 95 |
| Anthracene | 120-12-7 | - | < 0.010 | - |
| Fluoranthene | 206-44-0 | 7.27 | 0.021 | 96 |
| Pyrene | 129-00-0 | 7.55 | 0.018 | 97 |
| Benzo[a]anthr | 56-55-3 | - | < 0.010 | - |
| Chrysene | 218-01-9 | 9.29 | 0.011 | 98 |
| Benzo[b]fluora | 205-99-2 | - | < 0.010 | - |
| Benzo[k]fluora | 207-08-9 | - | < 0.010 | - |
| Benzo[a]pyrer | 50-32-8 | - | < 0.010 | - |
| Indeno[1,2,3-0 | 193-39-5 | - | < 0.010 | - |
| Dibenzo[a,h]a | 53-70-3 | - | < 0.010 | - |
| Benzo[g,h,i]pe | 191-24-2 | - | < 0.010 | |
| Total (USEPA | - | - | < 0.187 | - |

[&]quot;M" denotes that % fit has been manually interpreted

| Internal Stan | % Area |
|----------------|--------|
| 1,4-Dichlorobe | NA |
| Naphthalene- | 70 |
| Acenaphthene | 65 |
| Phenanthrene | 62 |
| Chrysene-d12 | 62 |
| Perylene-d12 | 61 |

| Surrogates | % Rec |
|------------------|-------|
| Nitrobenzene-d5 | N.D |
| 2-Fluorobiphenyl | 68 |
| Terphenyl-d14 | 109 |

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

Sample Details: BH105 W Job Number: W08_8900 LIMS ID Number: EX0835483 Date Booked in: 14-Oct-08 QC Batch Number: 923 **Date Extracted:** 23-Oct-08 **Quantitation File:** Initial Calibration **Date Analysed:** 24-Oct-08 **Directory:** 023PAH MS14\ Matrix: Water **Dilution:** 2.5 **Ext Method:** Sep. Funnel

UKAS accredited?: No

| Target Compounds | CAS# | R.T. | Concentration | % Fit |
|------------------------|----------|-------|---------------|-------|
| | | (min) | ug/l | |
| Naphthalene | 91-20-3 | 3.48 | 0.012 | 96 |
| Acenaphthylene | 208-96-8 | - | < 0.010 | - |
| Acenaphthene | 83-32-9 | 1 | < 0.010 | - |
| Fluorene | 86-73-7 | 1 | < 0.010 | - |
| Phenanthrene | 85-01-8 | 5.91 | 0.011 | 97 |
| Anthracene | 120-12-7 | 1 | < 0.010 | - |
| Fluoranthene | 206-44-0 | ı | < 0.010 | - |
| Pyrene | 129-00-0 | - | < 0.010 | - |
| Benzo[a]anthracene | 56-55-3 | - | < 0.010 | - |
| Chrysene | 218-01-9 | 1 | < 0.010 | - |
| Benzo[b]fluoranthene | 205-99-2 | 1 | < 0.010 | - |
| Benzo[k]fluoranthene | 207-08-9 | 1 | < 0.010 | - |
| Benzo[a]pyrene | 50-32-8 | 1 | < 0.010 | - |
| Indeno[1,2,3-cd]pyrene | 193-39-5 | - | < 0.010 | - |
| Dibenzo[a,h]anthracene | 53-70-3 | - | < 0.010 | - |
| Benzo[g,h,i]perylene | 191-24-2 | - | < 0.010 | - |
| Total (USEPA16) PAHs | - | - | < 0.163 | - |

"M" denotes that % fit has been manually interpreted

| Internal Standards | % Area |
|------------------------|--------|
| 1,4-Dichlorobenzene-d4 | NA |
| Naphthalene-d8 | 82 |
| Acenaphthene-d10 | 79 |
| Phenanthrene-d10 | 76 |
| Chrysene-d12 | 75 |
| Perylene-d12 | 72 |

| Surrogates | % Rec |
|------------------|-------|
| Nitrobenzene-d5 | N.D |
| 2-Fluorobiphenyl | 63 |
| Terphenyl-d14 | 104 |

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

Sample Details: BH106 W Job Number: W08_8900 LIMS ID Number: EX0835484 Date Booked in: 14-Oct-08 QC Batch Number: 923 **Date Extracted:** 23-Oct-08 **Quantitation File:** Initial Calibration **Date Analysed:** 24-Oct-08 **Directory:** 023PAH MS14\ Matrix: Water **Dilution:** 2.5 **Ext Method:** Sep. Funnel

UKAS accredited?: No

| Target Compounds | CAS# | R.T. | Concentration | % Fit |
|------------------------|----------|-------|---------------|-------|
| | | (min) | ug/l | |
| Naphthalene | 91-20-3 | - | < 0.010 | - |
| Acenaphthylene | 208-96-8 | - | < 0.010 | - |
| Acenaphthene | 83-32-9 | - | < 0.010 | - |
| Fluorene | 86-73-7 | - | < 0.010 | - |
| Phenanthrene | 85-01-8 | - | < 0.010 | - |
| Anthracene | 120-12-7 | - | < 0.010 | - |
| Fluoranthene | 206-44-0 | 1 | < 0.010 | - |
| Pyrene | 129-00-0 | - | < 0.010 | - |
| Benzo[a]anthracene | 56-55-3 | - | < 0.010 | - |
| Chrysene | 218-01-9 | - | < 0.010 | - |
| Benzo[b]fluoranthene | 205-99-2 | - | < 0.010 | - |
| Benzo[k]fluoranthene | 207-08-9 | - | < 0.010 | - |
| Benzo[a]pyrene | 50-32-8 | - | < 0.010 | - |
| Indeno[1,2,3-cd]pyrene | 193-39-5 | - | < 0.010 | - |
| Dibenzo[a,h]anthracene | 53-70-3 | - | < 0.010 | - |
| Benzo[g,h,i]perylene | 191-24-2 | - | < 0.010 | - |
| Total (USEPA16) PAHs | - | - | < 0.160 | - |

"M" denotes that % fit has been manually interpreted

| Internal Standards | % Area |
|------------------------|--------|
| 1,4-Dichlorobenzene-d4 | NA |
| Naphthalene-d8 | 84 |
| Acenaphthene-d10 | 84 |
| Phenanthrene-d10 | 83 |
| Chrysene-d12 | 83 |
| Perylene-d12 | 79 |

| Surrogates | % Rec |
|------------------|-------|
| Nitrobenzene-d5 | N.D |
| 2-Fluorobiphenyl | 48 |
| Terphenyl-d14 | 86 |

Customer and Site Details: Soil Mechanics: Hirwaun Industrial Estate

Sample Details: BH109 W Job Number: W08_8900 LIMS ID Number: EX0835485 Date Booked in: 14-Oct-08 QC Batch Number: 923 **Date Extracted:** 23-Oct-08 **Quantitation File:** Initial Calibration **Date Analysed:** 24-Oct-08 **Directory:** 023PAH MS14\ Matrix: Water **Dilution:** 2.5 **Ext Method:** Sep. Funnel

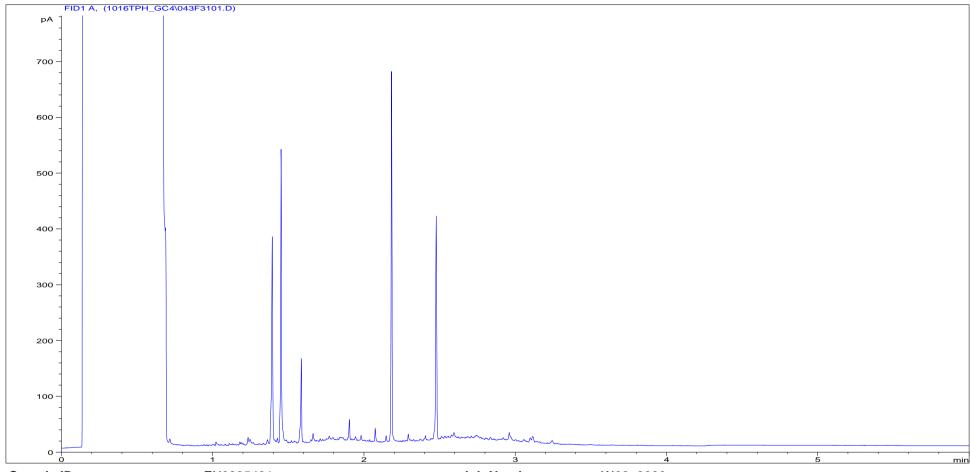
UKAS accredited?: No

| Target Compounds | CAS# | R.T. | Concentration | % Fit |
|------------------------|----------|-------|---------------|-------|
| | | (min) | ug/l | |
| Naphthalene | 91-20-3 | 3.48 | 1.219 | 98 |
| Acenaphthylene | 208-96-8 | 4.54 | 0.021 | 74 |
| Acenaphthene | 83-32-9 | 4.66 | 0.755 | 98 |
| Fluorene | 86-73-7 | 5.05 | 0.478 | 95 |
| Phenanthrene | 85-01-8 | 5.90 | 0.104 | 82 |
| Anthracene | 120-12-7 | 5.95 | 0.365 | М |
| Fluoranthene | 206-44-0 | 7.26 | 0.327 | 100 |
| Pyrene | 129-00-0 | 7.55 | 0.204 | 95 |
| Benzo[a]anthracene | 56-55-3 | 9.23 | 0.026 | 85 |
| Chrysene | 218-01-9 | 9.29 | 0.027 | 90 |
| Benzo[b]fluoranthene | 205-99-2 | - | < 0.010 | - |
| Benzo[k]fluoranthene | 207-08-9 | - | < 0.010 | - |
| Benzo[a]pyrene | 50-32-8 | - | < 0.010 | - |
| Indeno[1,2,3-cd]pyrene | 193-39-5 | - | < 0.010 | - |
| Dibenzo[a,h]anthracene | 53-70-3 | - | < 0.010 | - |
| Benzo[g,h,i]perylene | 191-24-2 | - | < 0.010 | - |
| Total (USEPA16) PAHs | - | - | < 3.586 | - |

"M" denotes that % fit has been manually interpreted

| Internal Standards | % Area |
|------------------------|--------|
| 1,4-Dichlorobenzene-d4 | NA |
| Naphthalene-d8 | 74 |
| Acenaphthene-d10 | 70 |
| Phenanthrene-d10 | 68 |
| Chrysene-d12 | 66 |
| Perylene-d12 | 62 |

| Surrogates | % Rec |
|------------------|-------|
| Nitrobenzene-d5 | N.D |
| 2-Fluorobiphenyl | 77 |
| Terphenyl-d14 | 104 |



Sample ID:EX0835481Job Number:W08_8900Multiplier:0.005Client:Soil Mechanics

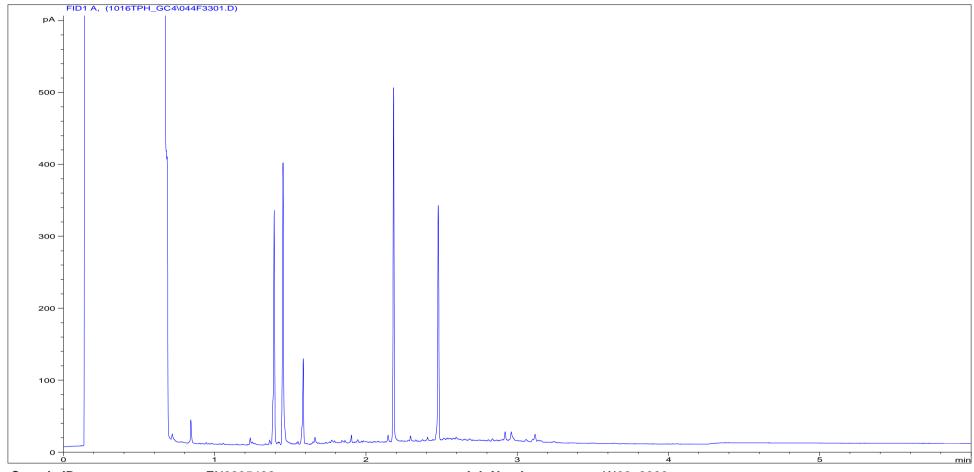
Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNF.M Client Sample Ref: BH101 W

Acquisition Date/Time: 16-Oct-08

Datafile: D:\TES\DATA\Y2008\1016TPH_GC4\043F3101.D

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Sample ID:EX0835482Job Number:W08_8900Multiplier:0.005Client:Soil Mechanics

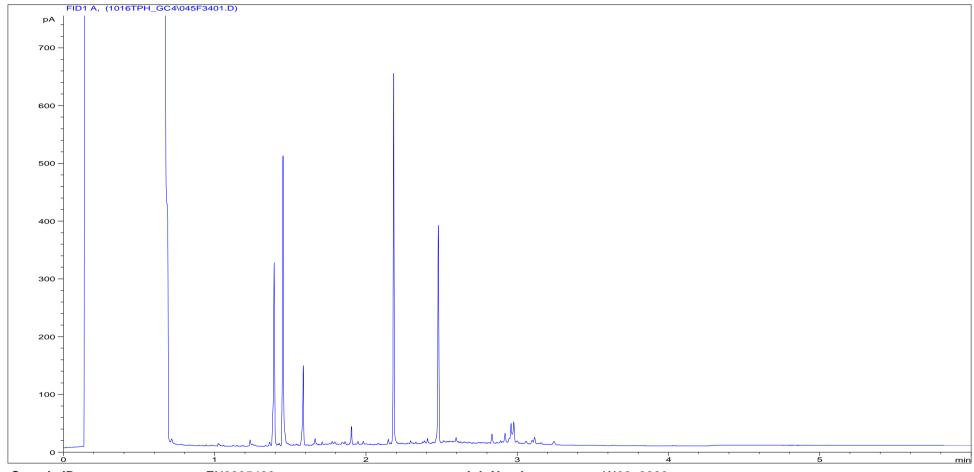
Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNF.M Client Sample Ref: BH103 W

Acquisition Date/Time: 16-Oct-08

Datafile: D:\TES\DATA\Y2008\1016TPH_GC4\044F3301.D

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Sample ID:EX0835483Job Number:W08_8900Multiplier:0.005Client:Soil Mechanics

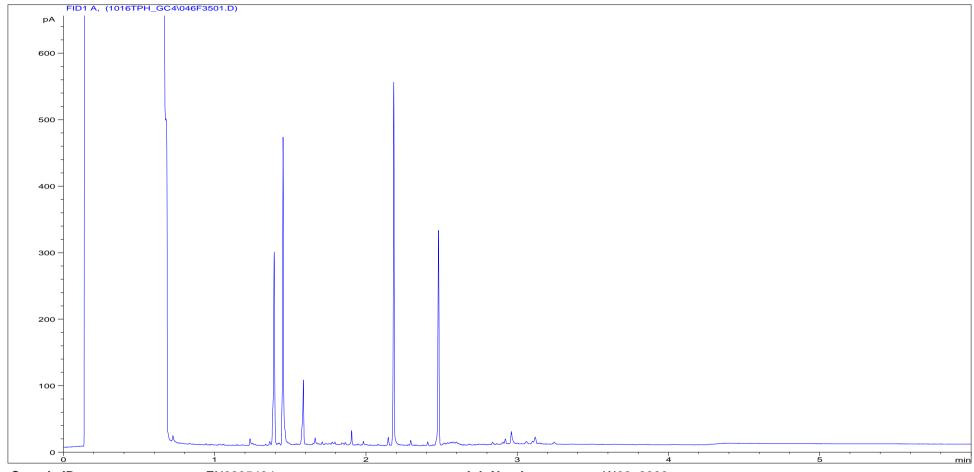
Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNF.M Client Sample Ref: BH105 W

Acquisition Date/Time: 16-Oct-08

Datafile: D:\TES\DATA\Y2008\1016TPH_GC4\045F3401.D

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Sample ID:EX0835484Job Number:W08_8900Multiplier:0.005Client:Soil Mechanics

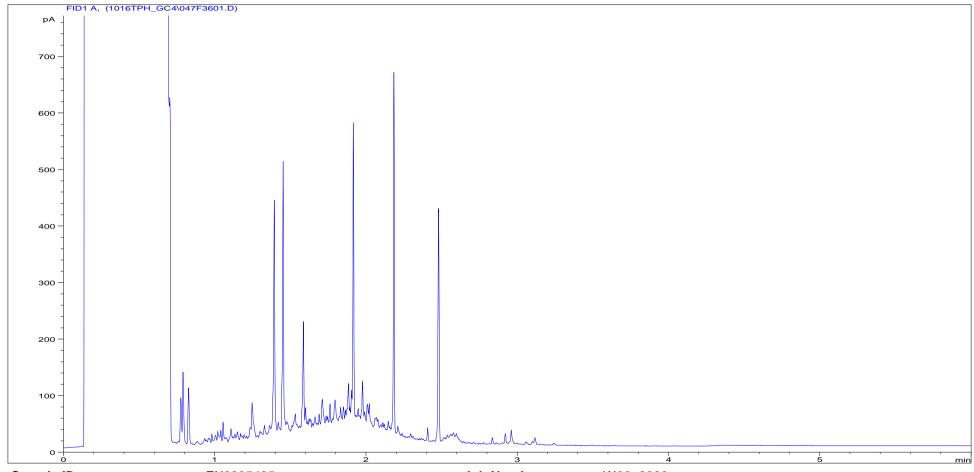
Dilution: 1 **Site:** Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNF.M Client Sample Ref: BH106 W

Acquisition Date/Time: 16-Oct-08

Datafile: D:\TES\DATA\Y2008\1016TPH_GC4\046F3501.D

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Sample ID:EX0835485Job Number:W08_8900Multiplier:0.005Client:Soil Mechanics

Dilution:1Site:Hirwaun Industrial Estate

Acquisition Method: 5UL_RUNF.M Client Sample Ref: BH109 W

Acquisition Date/Time: 16-Oct-08

Datafile: D:\TES\DATA\Y2008\1016TPH_GC4\047F3601.D

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Report Notes

Soil/Solid analysis specific:

Results expressed as mg/kg on an air dried basis unless stated otherwise S04 analysis not conducted in accordance with BS1377 unless otherwise stated Water Soluble Sulphate on 2:1 water:soil extract AR denotes analysis conducted on the As Received sample

Water analysis specific:

Results expressed as mg/l unless stated otherwise

Oil analysis specific:

Results expressed as mg/kg unless stated otherwise S.G. expressed as g/cm³@ 15°C

Filter analysis specific:

Results expressed as mg on filter unless stated otherwise

VOC analysis specific:

Explanatory notes for data flagging

U = undetected above reporting limit

J = concentration at instrument was below lowest calibration standard

E = concentration at instrument was above top calibration standard

B = compound was detected in method blank

Gas (Tedlar bag) analysis specific:

Results expressed as ug/l unless stated otherwise

Air (Carbon tube) analysis specific:

Results expressed as ug on tube unless stated otherwise

Asbestos analysis specific:

CH denotes Chrysotile

CR denotes Crocidolite

AM denotes Amosite

NADIS denotes No Asbestos Detected in Sample

NBFO denotes No Bulk fibres Observed

General notes:

^ this analysis was subcontracted to another laboratory

\$ Within laboratory tolerances

\$\$ unable to analyse due to nature of sample

¥ Results for guidance only, possible interference

& Blank corrected

I.S insufficient sample for analysis

Intf Unable to analyse due to interferences

N.D Not determined

N.R Not recorded

N.Det Not detected

Req Analysis Requested, see attached sheets for results

▶ Raised detection limit due to nature of sample

* denotes that all accreditation has been removed by the laboratory for this result.

‡ denotes that Mcerts accreditation has been removed by the laboratory for this result.

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory

may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected.

If you require further details of the circumstances leading to the removal of the accreditation from any data item please do not hesitate to contact the laboratory

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ENCLOSURE E PHOTOGRAPHS

Rotary Cores Plate E1 to E5
Trial Pits Plate E6 to E23







Notes Project Hirwaun Industrial Estate Plate
Project No H8076 Enviroparks Ltd

Remain Industrial Estate Plate
E1





Notes Project Hirwaun Industrial Estate Plate
Project No H8076 E2
Carried out for Enviroparks Ltd







Notes Project Hirwaun Industrial Estate Project No
Carried out for Enviroparks Ltd







Notes Project Hirwaun Industrial Estate Plate
Project No H8076 E4
Carried out for Enviroparks Ltd





Notes Project Hirwaun Industrial Estate Project No H8076 E5
Carried out for Enviroparks Ltd

Trial Pit Photographs







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Trial Pit Photographs







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Figure







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Figure







Notes: Project Hirwaun Industrial Estate Figure

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Figure







Notes: Project Hirwaun Indusrial Eastate Figure

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Notes: Project Hirwaun Indusrial Eastate

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Figure







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Project

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Figure

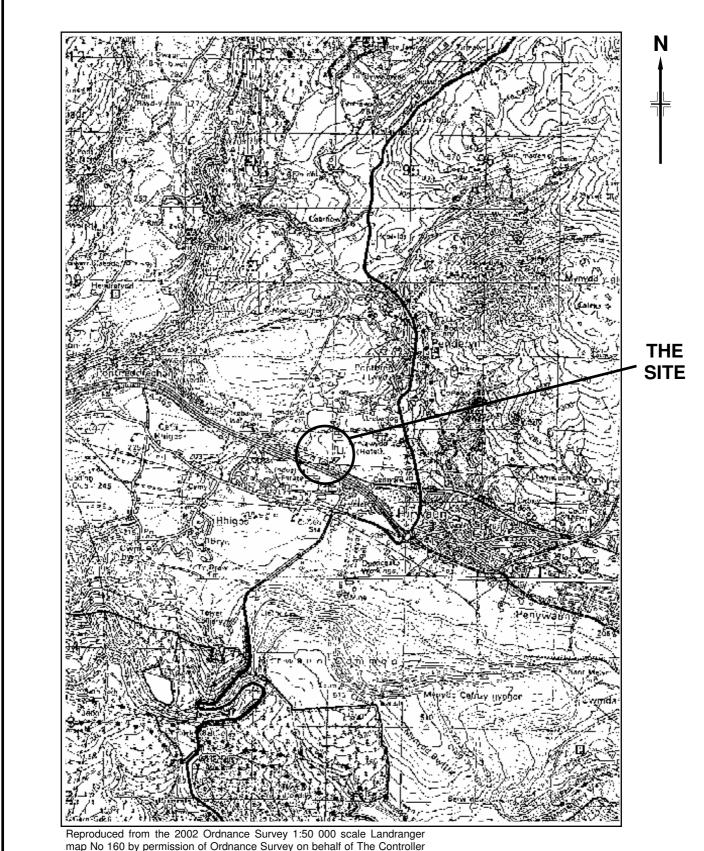


ENCLOSURE F DRAWINGS

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Site Location Plan

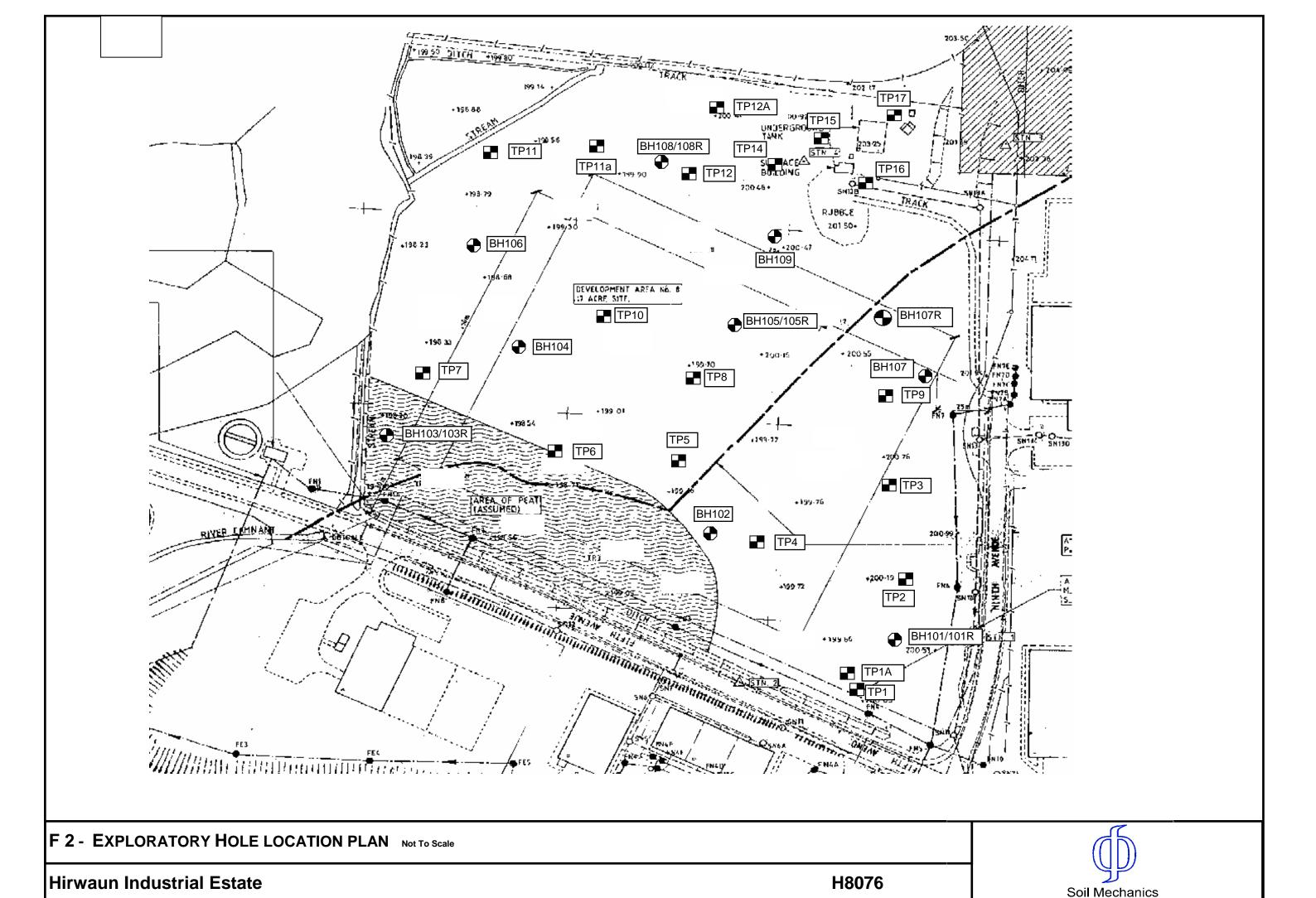




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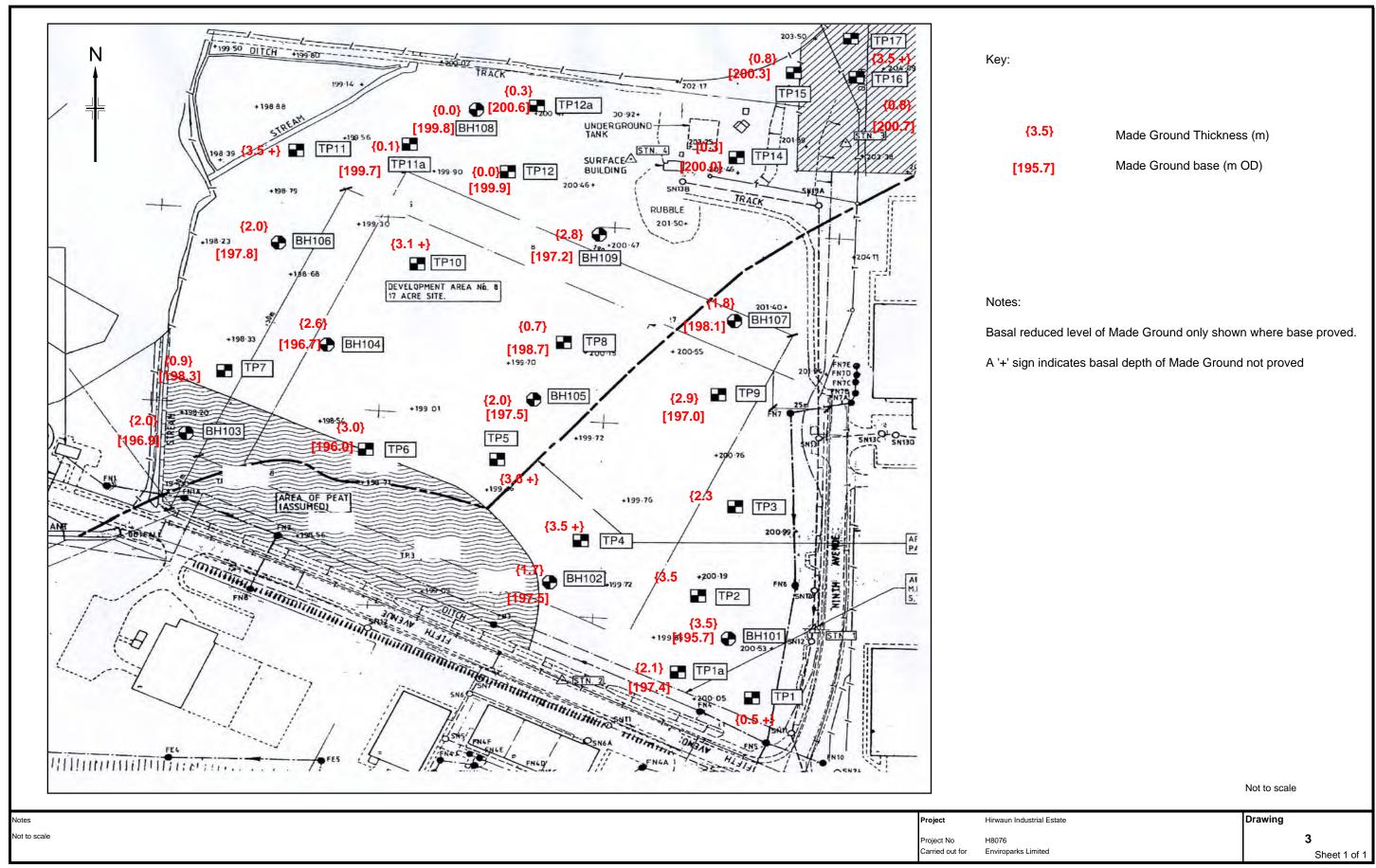
Notes: Scale 1:50 000 Project Hirwaun Industrial Estate Project No. H8076 Carried out for Enviroparks Ltd Figure

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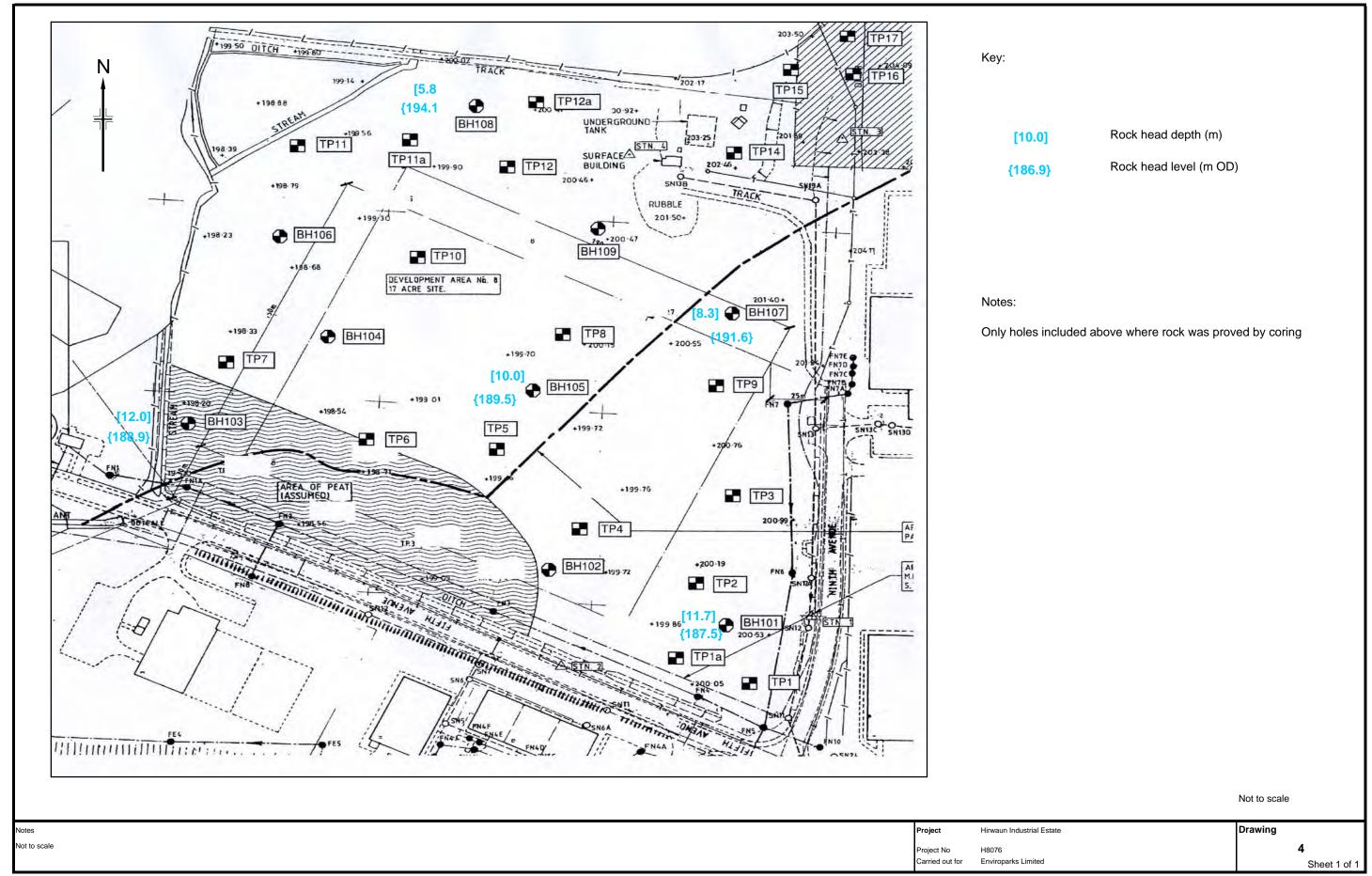
Made Ground Depths & Basal Reduced levels





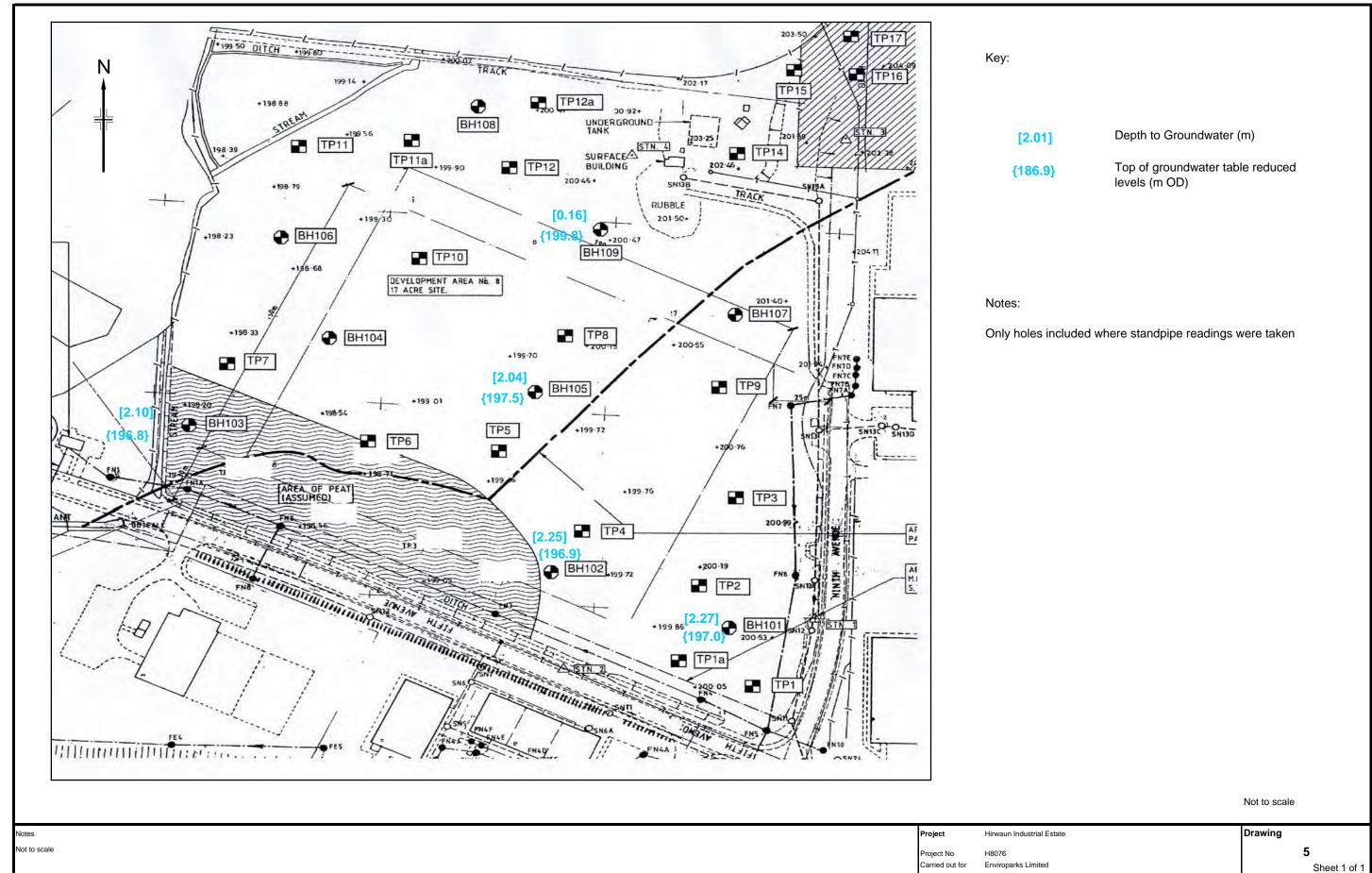
Rock Head Depths and Reduced Levels





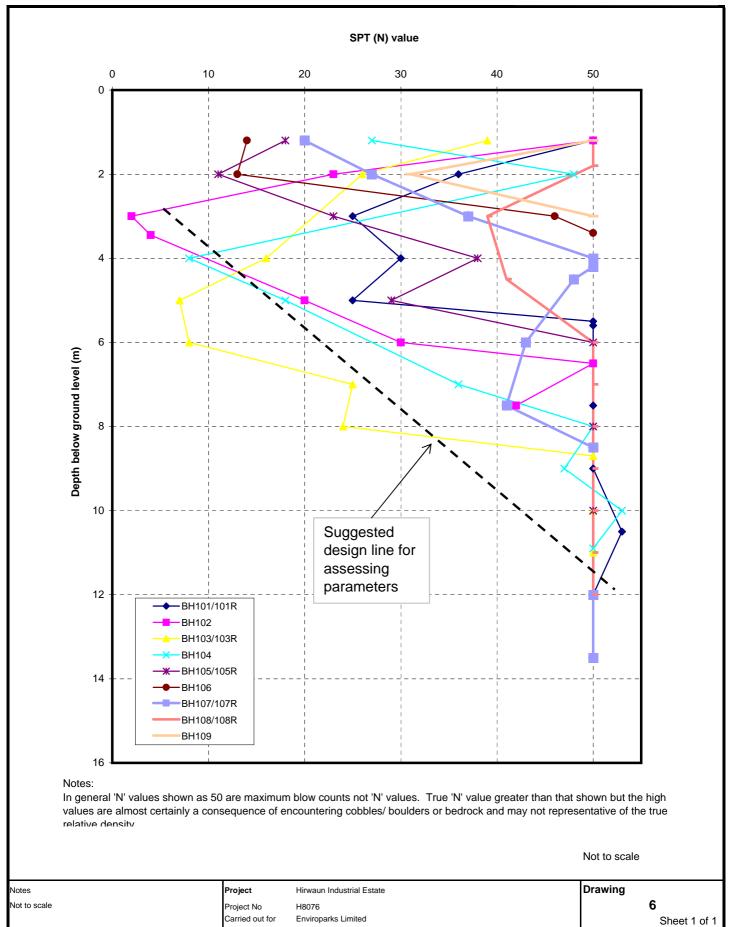
Groundwater Depths and Reduced Levels





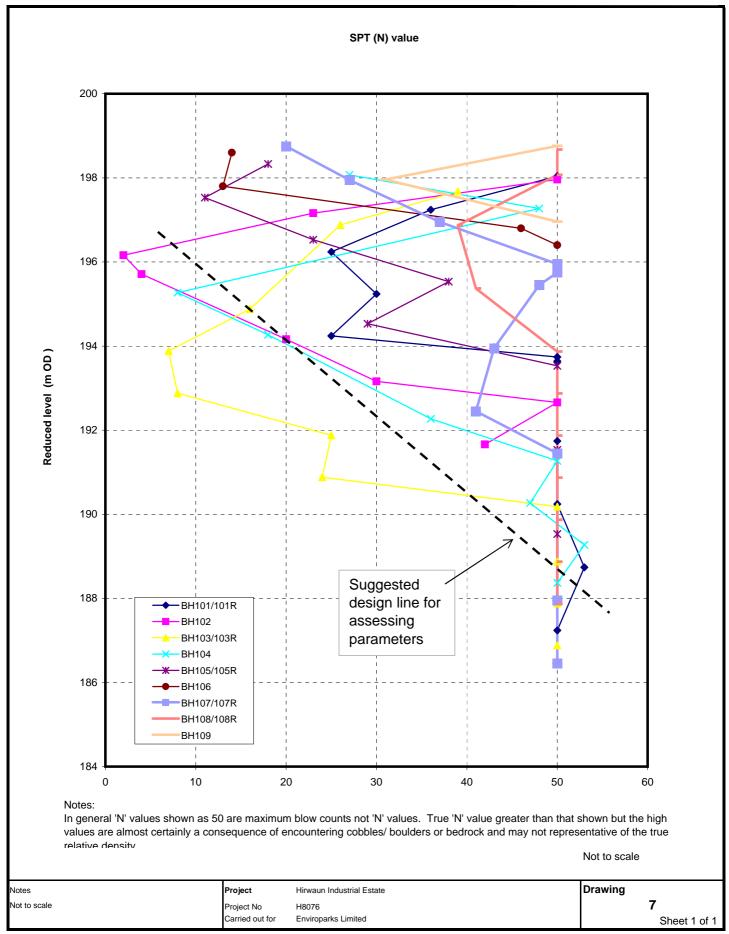
Plot of SPT 'N' Value Against Depth





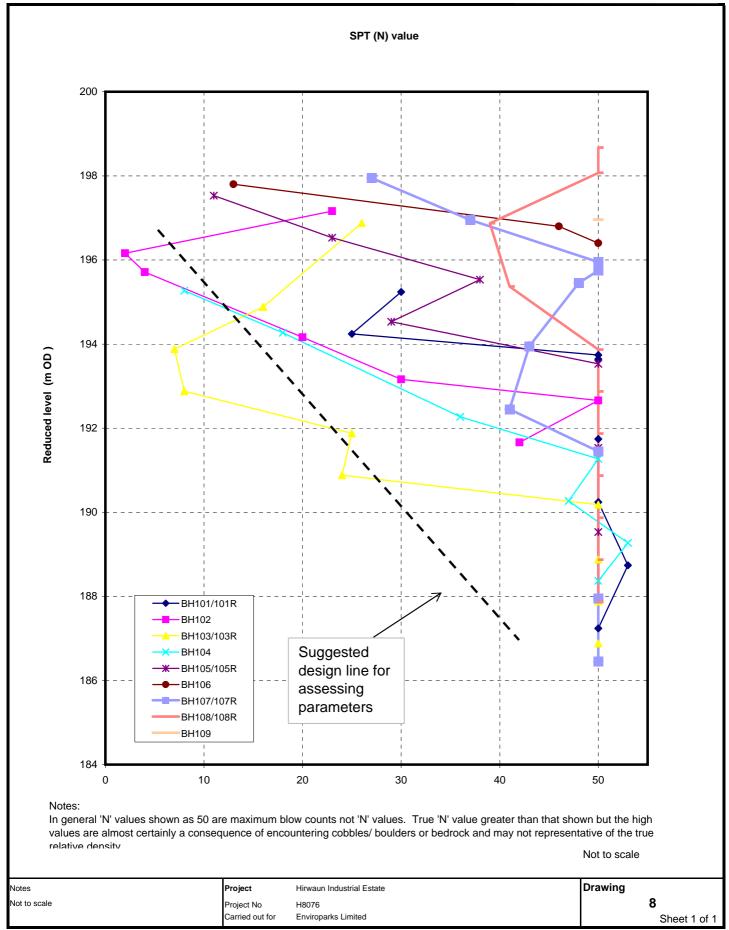
Plot of SPT 'N' Value Against Reduced Level





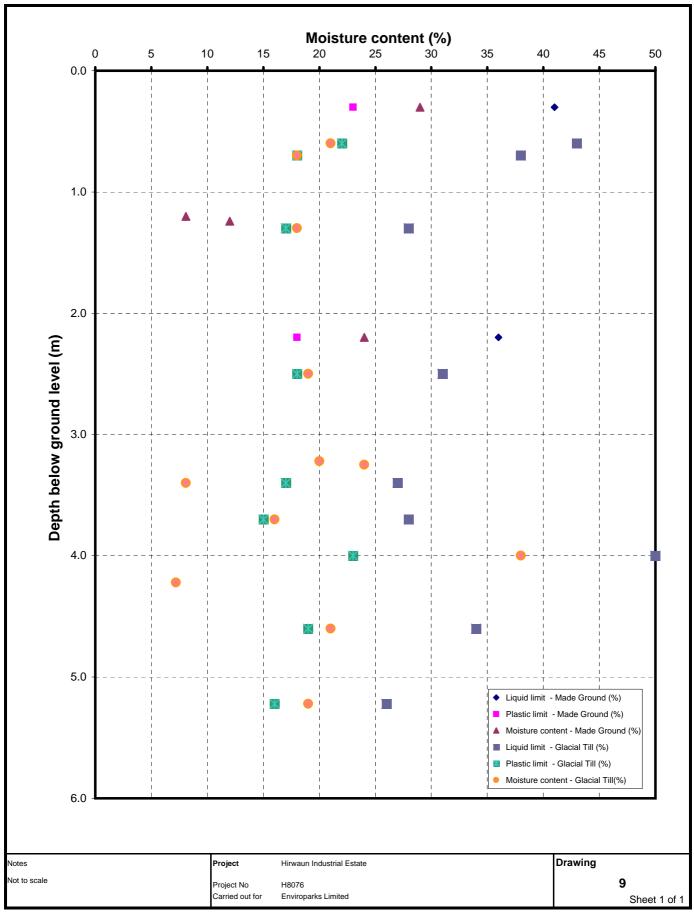
Plot of SPT 'N' Value Against Reduced Level - Glacial Deposits





Plot of Index Properties against Depth





Plasticity Chart



