S NORTON & CO.
TENAX ROAD
TRAFFORD PARK

PHASE 2

GEOENVIRONMENTAL INVESTIGATION AND ASSESSMENT

FOR

AXION RECYCLING

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APPENDICES

1.0 INTRODUCTION

Appointment

1.1 WML Consulting was commissioned by Axion Recycling to undertake a Geo-environmental Investigation and Assessment of the S. Norton & Co site off Tenax Road, Trafford Park.

Proposed Development

1.2 It is understood that current development proposals comprise the construction of a new portal framed industrial building. The building will house storage areas and heavy plant associated with the sorting and recycling of automotive scrap. A proposed development plan is presented in Appendix 01.

Objective

1.3 The objective of the ground investigation and assessment was to provide geotechnical recommendations for construction design purposes together with a geoenvironmental risk assessment in terms of possible ground contamination.

1.4 To achieve the objective, the following tasks were undertaken:

- Establish, through undertaking a Phase 1 Desk Study, the geological, hydrogeological and environmental setting of the site so as to identify any potential ground constraints to development through a site specific conceptual model.
- Design an appropriate Phase 2 ground investigation in accordance with the Environment Agency (2004) Model Procedures for the Management of Land Contamination, CLR11.
- With due consideration of proposed land use, characterise the ground conditions both in terms of soil geotechnical parameters and ground contamination from information provided by an appropriate ground investigation;
- Provide recommendations regarding suitable foundations, floor slabs and new pavement construction together with any other geotechnical considerations that could affect possible future development;
- Confirm and refine the ground conceptual model for the site and undertake an appropriate Phase 2 Generic Quantitative Risk Assessment (GQRA).
- Where appropriate, provide recommendations for ground contamination risk mitigation where such risks are considered unacceptable for the proposed site development.

Scope

1.5 The Phase I Desk Study has been undertaken and is presented in the following WML Consulting Limited report:

- Phase 1 Desk Study and Preliminary Geoenvironmental Assessment (Reference 5044G/G/01, dated 12th December 2012).

1.6 This report includes the findings of an appropriate Phase 2 Ground Investigation designed on conclusions and recommendations provided in the Phase 1 report. For ease of reference, the findings of the Phase 1 Desk Study are summarised in the following sections. The two reports are however not exclusive and should therefore be read in conjunction.

1.7 The ground investigation was undertaken in general accordance with BS5930:1999 *Code of Practice for Ground Investigation* and BS10175:2011, *Investigation of potentially contaminated sites.*

1.8 Geotechnical soil testing has been undertaken in accordance with guidelines provided in BS1377:1990 – Parts 1-9, *Method of test for soils for civil engineering purposes*.

2.0 SITE LOCATION AND DESCRIPTION

Site Location

2.1 The site is located adjacent to the east of Tenax Road in an industrial area of Trafford Park. It is centred on approximate Ordnance Survey National Grid Reference 378575,397350 and has an area of around 0.27 hectares. Abutting the eastern site boundary is the main S. Norton & Co recycling facility. A topographical survey plan of the site is presented in Appendix 01.

Site Description

2.2 The site is generally flat and covered with a combination of existing rough asphalt and concrete hardstandings. The site is currently used mainly for car parking. The eastern area of the site is used for temporary storage of materials including metal and hardcore. A small blockwork structure for the connection of a proposed electricity spur also occurs in this area.

2.3 The large steel framed building located immediately east of the site is currently used for the purpose of vehicle salvage, including metal shearing, shredding and processing along with associated stockpiles of pre-treated waste metal, processed graded metal, non-metallic recyclables and non-recyclable waste.

3.0 SUMMARY OF ENVIRONMENTAL AND HISTORICAL SETTING

3.1 The following paragraphs summarise the most relevant findings of the Phase 1 Desk Study report.

3.2 The site is indicated to be underlain by Glaciofluvial Sheet Deposits (Sand and Gravel) over Laminated Clay of Glacial origin. Underlying solid geology is indicated to be sandstone of the Sherwood Sandstone Group.

3.3 Previous investigation identified the site in part to be underlain by bitumen hardstanding and made ground to a depth of 0.75m. Medium dense, brown, silty, fine to coarse gravelly sand extended to a depth of 4.3m. The sand stratum was underlain by firm to stiff, silty sandy gravelly clay (Glacial Till). Groundwater was encountered as perched above the Glacial Till at a depth of around 2.50mbgl.

3.4 No significant or widespread ground contamination was encountered with no significant concentrations of hazardous ground gas.

3.5 In view of the geology beneath the site, the risk of old abandoned shallow mine workings affecting the site can be discounted.

3.6 The property is not in a Radon Affected Area as defined by the Health Protection Agency. Therefore no radon protection measures are necessary.

3.7 The drift deposits beneath the site have been classified by the Environment Agency as a Secondary A Aquifer (formerly Minor Aquifer).

3.8 The solid geology beneath the site is recorded as a Principal Aquifer (formerly Major Aquifer).

3.9 However, the site is not shown to be within an Environment Agency groundwater Source Protection Zone.

3.10 The nearest recorded Groundwater and Potable Water Abstraction licenses are both recorded as occurring at the same site some 640m to the east. The licensed site is considered sufficiently remote as not to be affected by the subject site. There are no recorded Surface Water Abstraction licences within 1km of the site

3.11 There are no Detailed River Networks within 500m or Surface Water Features within 250m and are thus considered outside the site's zone of influence.

3.12 There are no recorded active landfills within a 1.5km radius of the site and can therefore be discounted as providing an influence.

3.13 The nearest historic landfill is located some 460m to the east of the site and is considered sufficiently distant from the site as not to provide an influence.

3.14 The site is located within an industrial area of Trafford Park with several authorised processes being recorded mainly to the west and north-west of the site. The S. Norton & Co facility is noted as being around 90m to the east.

3.15 There are no Petrol Fuel Sites recorded within 500m of the subject site.

3.16 An Underground High Pressure Oil and Gas Pipeline is recorded as running beneath Tenax Road, immediately to the west of the site. Records of the pipeline are held by Fisher German Chartered Surveyors.

3.17 The nearest water industry referral (potentially harmful discharges to public sewer) is located some 500m to the east of the site. There are no records of potentially harmful discharges to controlled waters within 500m of the site.

3.18 The nearest active List 1 Authorised Substance to the site is located some 230m to the south. The List 1 substance is recorded as mercury and 'other'. There are no List 2 Authorised substances within 500m of the site.

3.19 There are no records of Licensed Discharge Consents within 500m of the site.

3.20 There are 2no recorded List 2 pollution incidents within 250m of the site. Both refer to Category 3 (Minor) impacts to air to the west and south-west of the site. There are no recorded List 1 pollution incidents within 500m of the site.

3.21 There are no records of sites determined as Contaminated Land under Part IIA of the Environmental Protection Act 1990 within 500m of the site.

3.22 There are no environmentally sensitive sites located within 500m of the proposed development.

3.23 The site is not located within an Environment Agency Zone 2 or 3 floodplain.

3.24 British Geological Survey records indicate that there are high susceptibility ground water flood areas within 50m of the site boundary.

3.25 Historical plans indicate that the site has remained ostensibly undeveloped while surrounding land has been subject to significant heavy industrial use which has included extensive chemical works and metal processes. Significant ground contamination as a result of the site's industrial history is therefore not anticipated although it cannot be discounted at this stage that it's more recent use for storage may have resulted in localised contamination due to spillages and/or leakages of fuels. Also, the possibility of mobile contamination migrating onto the site from other premises cannot be wholly discounted.

4.0 PRELIMINARY RISK ASSESSMENT

4.1 Based on the above findings, the Phase 1 Desk Study report provided the following Preliminary Conceptual Model and Risk Assessment based on a proposed industrial development of a portal framed building with associated pavements and minor landscaped areas.

Source	Pathway	Receptor	Linkage	Comment
The site has not been subject to recorded potentially contaminative use. However, ground contamination may have resulted from localised fuel spillages and/or migration from adjacent sites. Contamination sources cannot therefore be discounted at this stage.	Direct contact, ingestion of soil, dermal contact, dust exposure pathways.	Current Site Users	Unlikely	The site is currently covered by hardstanding. As site use and hence exposure is periodic, the risk to current site users is considered LOW.
		Site End Users	Unlikely	Although localised areas of ground contamination cannot be discounted at this stage, the proposed development introduce a thick concrete base and hard external areas, separating the end users from any potential contaminants. A LOW preliminary risk is therefore assessed until such time as further ground investigation information is available.
		Construction Workers	Possible	Construction workers will be exposed to sub-soils at the site during earthworks and foundation construction. Any perceived contamination risks will however be mitigated by adopting good site working practices including appropriate Health and Safety measures during the works, thus providing a LOW to MEDIUM preliminary risk.
		Adjacent land users	Unlikely	Contact via wind-blown dust/ debris, particularly during the development phase is possible. The current risk is considered LOW although this would increase during construction works. Appropriate dust control measures will therefore be required as part of good site working practices during construction.
The site has not been subject to recorded potentially contaminative use. However, ground contamination may have resulted from localised fuel spillages and/or migration from adjacent sites. Mobile contamination sources cannot therefore be discounted at this stage.	Direct downward migration through leaching and/or mobile liquids.	Groundwater	Unlikely	Due to its setting within a heavy industrial area, the site is unlikely to impact the Secondary A aquifer to a greater degree than the surrounding premises. The site is indicated to be underlain by relatively impermeable Glacial Till which will significantly reduce the potential for downward migration of possible mobile contaminants into the underlying secondary A aquifer. The perceived risk to groundwater is therefore considered LOW although a precautionary approach is considered appropriate until such time as the low risk is confirmed by ground investigation.
	Off-site migration in groundwater or surface water flow.	Surface water	Unlikely	No significant sources of mobile contamination are envisaged with the nearest Surface Water Features and Detailed River Networks being considered sufficiently remote as not to be impacted. The perceived risk to surface water is therefore considered VERY LOW.

Source	Pathway	Receptor	Linkage	Comment
		Groundwater/ surface water abstractions	Unlikely	The site is not within an Environment Agency Source Protection Zone and the nearest ground, surface or potable water abstraction is more than 600m from the site. The risk to groundwater/surface water abstractions is therefore considered VERY LOW.
		Adjacent Properties	Unlikely	No significant contamination sources are envisaged therefore the site is unlikely to significantly impact on adjoining land to a greater degree than may already exist. The preliminary risk to adjacent properties is therefore considered LOW.
		Ecology	Unlikely	There are no ecologically sensitive sites within influencing distance of the subject site. The risk to ecology is therefore considered VERY LOW.
The likelihood of significant volatile contaminants occurring at the site due to its past use is considered low. However, given the close proximity of other industrial sites, the presence of potentially volatile contaminants occurring beneath the site cannot be wholly discounted at this stage.	Inhalation of harmful vapours (indoor and outdoor airspaces)	Current Site Users	Unlikely	The site is currently used for car parking and temporary storage. As such, the exposure scenario is outdoor and periodic. The risk to current site users is therefore considered LOW.
		Site End Users	Possible	The proposed end use will be a large open-spaced industrial building with substantial floor slabs and adequate ventilation to provide a LOW risk from indoor inhalation of volatile contaminants. However, the possibility of exposure within confined spaces within the building cannot be wholly discounted at this stage until ground investigation information is available.
		Construction Workers	Possible	In the event of construction workers coming into contact with possible volatile compounds, the exposure time will be relatively short. The risk to construction workers, assuming that appropriate health and safety measures will be adopted, is therefore considered LOW to MEDIUM.
		Adjacent Properties	Unlikely	No significant sources of ground contamination are envisaged with the site likely to be in no worse a condition than adjacent properties. The potential risk to adjoining site users is therefore considered LOW and no greater than that provided by the surrounding environment.
The site is not within influencing distance of any recorded landfill. No significant thickness of degradable Made Ground is envisaged.	Emissions from the ground collecting in confined spaces and excavations	Construction/ services maintenance workers	Unlikely	A significant thickness of potentially degradable material on site is considered unlikely therefore the potential to generate significant volumes of toxic and/or flammable/explosive gas is low. Assuming that appropriate health and safety measures will be adopted during construction, the preliminary risk is therefore considered VERY LOW.

Source	Pathway	Receptor	Linkage	Comment
	Migration of gases on/off site and collecting in confined spaces on/off site.	Adjoining site users	Unlikely	A significant thickness of potentially degradable material on site is considered unlikely therefore the potential to generate significant volumes of toxic and/or flammable/explosive gas on site is low. The potential risk to adjoining site users is therefore considered LOW and no greater than that provided by the surrounding environment.
		Current/future site users	Unlikely	The potential to generate significant quantities of toxic and/or flammable/explosive gas on site is low. In addition, as there are no landfills within influencing distance of the site, the perceived risk to site end users is therefore considered LOW. This will need to be confirmed by appropriate ground investigation
The site is not in an area which is affected by naturally occurring radon gas.	Natural emissions from the ground collecting in confined spaces within buildings	Site end users	Unlikely	The site is not located in an area where radon protection measures are required. No further action is necessary regarding radon protection as the risk is VERY LOW.
Chemicals which could prove aggressive to construction materials may be present on site.	Direct contact	Construction concrete, plastic water pipes.	Possible	A precautionary approach at this time determines that the risk to construction materials is considered MEDIUM. However, any aggressive ground conditions identified after site investigation and assessment will be mitigated as part of the structural design.

Preliminary Risk Assessment Summary

4.2 Under the proposed development scenario, most of the potential pollution linkages were considered unlikely with associated preliminary risks generally being assessed as low to medium.

4.3 However, as the preliminary risk assessment was based on certain assumptions in the conceptual model, a Phase 2 Ground Investigation was necessary to obtain physical and chemical information on the ground and hence verify or otherwise the preliminary assumptions.

5.0 SITE INVESTIGATION

Rationale

5.1 Intrusive investigations were undertaken primarily to provide geotechnical parameters for structural design purposes but also to verify the preliminary site conceptual model and thus confirm the anticipated low environmental risk.

5.2 Previous investigations for the initial phase of development to the east of the site included a borehole located on the subject site. Information relating to this borehole (BH4), including the results of laboratory analysis, is included in Appendix 06. The location of BH4 is shown on the Site Investigation Location Plan in Appendix 01.

5.3 Trial pits and small diameter window sampling probes were undertaken to provide information on near surface deposits and to provide samples for chemical analysis. A general coverage was considered appropriate with due regard to restrictions provided by services and access.

5.4 Gas monitoring standpipes were installed in selected window sample probes for the measurement of ground gas.

5.5 In view of no specific historical contaminative use at the site, chemical analysis of a general suite of contaminants of concern was undertaken on selected samples of soil to confirm the anticipated low contamination risk and to establish the chemical suitability of soils for re-use within the development. Analysis for mobile contaminants was undertaken specifically in view of the site being underlain by a sensitive aquifer.

Intrusive Works

5.6 Ground Investigations were undertaken by Geo-Ventures Limited on the 6th and 8th December 2012 and comprised the following:

- 5no small diameter window sample probes to a maximum depth of 4.45m below ground level (bgl).
- 4no machine excavated trial pits to a maximum depth of 3.00mbgl.

5.7 The findings of the investigation, together with the Exploratory Hole Location Plan are presented in Appendix 02.

Monitoring Standpipe

5.8 Monitoring wells for groundwater and ground gas measurements were installed in selected probeholes as indicated on the logs presented in Appendix 02.

Geotechnical and Chemical Testing

5.9 In-situ geotechnical testing was undertaken at regular intervals during the formation of the probeholes in the form of Standard Penetration Tests (SPTs). The results for this testing are presented on the descriptive logs in Appendix 02.

5.10 In addition, 3no in situ California Bearing Ratio (CBR) tests were undertaken within selected trial pits at a depth of 0.50m below ground level.

5.11 The results of the CBR testing are presented in Appendix 03.

5.12 Chemical analysis was undertaken on selected samples for the following contaminants of concern:

- Total Arsenic, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Zinc.
- Chromium VI, Sulphur, Cyanide.
- 2:1 Sulphate, pH, Phenols, Total Organic Carbon.
- Speciated USEPA Polyaromatic Hydrocarbons (PAH).
- Speciated Total Petroleum Hydrocarbons (TPHCWG).
- Benzene, Ethylbenzene, Toluene, Xylene (BTEX).
- Methyl tert-butyl ether (MTBE).

5.13 Due to the sensitivity of the underlying aquifer, selected analytes were subjected to leachability testing to determine their potential mobility.

5.14 The results of the chemical analysis are presented in Brownfield Solutions Report in Appendix 04.

Gas and Groundwater Monitoring

5.15 Gas and groundwater monitoring has been carried out on two occasions to date on the 13th December 2011 and 3rd January 2012. Although three monitoring standpipes were installed, only two have been monitored to date due to one being inaccessible. The monitoring results to date are presented in Appendix 05.

6.0 GROUND CONDITIONS

Stratigraphy

6.1 Ground conditions encountered in the current and previous investigation generally confirm those identified in the published literature and, in summary, comprise Made Ground immediately overlying peat and/or Glacial Sand and Gravel. These deposits were indicated to be underlain by Glacial Till in previous investigations (BH4).

Made Ground

6.2 Made ground was encountered to depths of between 0.50 and 1.30m (BH4) with an average of around 0.80m below ground level (bgl).

6.3 This predominantly comprised a surface cover of tarmac over made ground of variable constituents but in the main comprising limestone hardcore, broken brick, clay and ash with local areas of Pulverised Fuel Ash (PFA).

Peat

6.4 The made ground, within the majority of investigation locations, is underlain by a 0.5 to 1.0m layer of peat, being describes as well compacted/firm, black and amorphous.

6.5 A single SPT in the peat provided an 'N' value of 16, confirming the material to be relatively compact at that location.

Glaciofluvial Sand and Gravel

6.6 The made ground/peat deposits are underlain by Glaciofluvial Sand and Gravel, being generally described as brown and grey fine to medium sand with occasional fine sub-rounded gravel. There are indications that the stratum becomes more gravelly with depth.

6.7 SPT 'N' values in the sand range from 2 to 16 with an average of around 9. The lower-bound values however occur below the groundwater table and thus may be the result of loosening effects during drilling rather than an indication of a loose relative density.

Glacial Till

6.8 Although none of the window sample probes or trial pits bottomed the Glaciofluvial Sand and Gravel, the CC Geotechnical BH4 encountered Glacial Till at a depth of 4.30mbgl.

6.9 The Till was described as brown, silty, sandy, gravelly clay which was proven to a depth of 12.0mbgl.

6.10 Classification tests on the clay indicated natural moisture contents decreasing from 28% to 14% with depth. A single Atterberg Test on a sample from the upper horizon indicated clay of intermediate to high plasticity.

6.11 SPT 'N' values in the clay of 12 to 18 indicated a consistency of firm becoming stiff with depth.

6.12 2no Undrained Triaxial Compressive Strength tests on the material indicated results of 63 and 69kPa, indicating a firm consistency.

Visual/Olfactory Evidence of Contamination

6.13 No visual and/or olfactory evidence of significant ground contamination was identified during the investigation.

Groundwater

6.14 Groundwater was struck during the investigations at a depth generally of around 2.0mbgl. Standing water levels measured in standpipes during the ground gas monitoring ranged from approximately 1.60m to 2.10mbgl.

6.15 It should be appreciated that the groundwater monitoring was undertaken during a very short period of time. Significant variations in the long term groundwater regime may occur at other times, particularly with prolonged, extreme weather conditions, and that no account can be taken of such in this report.

General

6.16 It should also be appreciated that ground conditions may vary locally from those encountered within the borehole and that no account can be taken in this report of such variations.

7.0 GEOTECHNICAL APPRAISAL

Site Preparation and Earthworks

7.1 Current development proposals comprise the construction of an industrial facility with localised landscaping adjacent to Tenax Road.

7.2 No significant demolition works are envisaged although the removal of existing hardstandings will be required. Such materials may be suitable for re-use subject to crushing to an appropriate specification.

7.3 The site is ostensibly flat with no significant earthworks envisaged.

Foundations and Floor Slabs

7.4 Made ground and peat deposits should be considered unsuitable for the direct support of structural loads as their variably loose / soft and compressible nature may result in unacceptable total and differential settlements.

7.5 The underlying Glaciofluvial Sand and Gravel is suitable for the direct support of structural loads although the high groundwater table determines that allowable bearing pressures should not exceed 75kPa to limit settlements to tolerable limits.

7.6 However, as relatively high structural loads may be envisaged locally on the floor slab, it may be advisable to undertake ground improvement works so as to provide an acceptable bearing formation for the slab. For this to be effective, the layer of peat would need to be removed with the overlying excavated made ground being sorted and segregated into suitable and unsuitable material for re-use as engineering fill. Any made ground comprising soft clay and silt would therefore need to be removed from beneath the proposed construction as these would be unsuitable for re-use. Providing the remaining material met relevant suitability criteria and was adequately compacted to an engineering specification, the floor slab could then be constructed as ground bearing.

7.7 An alternative solution would be to improve the ground by vibro-techniques. This would still require the removal of peat, soft clay and silt but would have the added advantage of improving the bearing capacity of the underlying sand and gravel with a resulting reduction in foundation sizes.

7.8 Should excavations for the removal of peat and any unsuitable made ground prove impractical or undesirable, a piled foundation and floor slab would need to be adopted with piles being taken down a sufficient depth into the Glacial Till to achieve suitable working loads. A piling contractor would need to be consulted in this respect and also to determine the most suitable type of pile to be adopted.

Pavements

7.9 In situ CBR test result taken at 0.50m depth within the made ground range from 13.6 to 25%. However, due to the variable nature of the made ground, it is advisable to adopt a CBR of no more than 5% for design purposes. In addition, consideration should be given to the removal of peat where this occurs beneath proposed external pavements as the potential for continued

consolidation of the material could lead to unacceptable total and differential settlements at the surface.

7.10 Notwithstanding this, the formation at any level should be proof-rolled prior to pavement construction, and any soft zones thus revealed, excavated and replaced with appropriately graded and engineered granular fill.

Excavations and Groundwater

7.11 Excavations at the site will be possible using conventional hydraulic plant. Excavations within the granular near surface deposits will need to be supported to maintain their stability. In addition, excavations to depths of around 1.50mbgl may well encounter groundwater with appropriate dewatering measures being required to keep excavations dry.

Concrete Design

7.12 Design/mix of buried concrete should be undertaken in accordance with the "Aggressive Chemical Environment for Concrete" (ACEC) classification, of BRE Special Digest 1:2005 (Concrete in Aggressive Ground). With reference to the site history, it is deemed necessary to classify the site as "Brownfield", with respect to BRE Special Digest.

7.13 Results of 2:1 water/soil extract for sulphate range all fall below the laboratory detection limit of 0.1g/l. Values of pH range from around 6.5 to 9.5. On the basis of these results, the typical design sulphate (DS) class and "Aggressive Chemical Environment for Concrete" (ACEC) class for the site are DS-1 and AC-1 respectively.

8.0 GENERIC QUANTITATIVE RISK ASSESSMENT (GQRA)

General

8.1 The Desk Study report has concluded that, due to the absence of historic contaminative land use, together with the nature of the proposed development, the potential for a significant pollution linkage to be present is low.

8.2 Further to this, no visual or olfactory evidence of significant ground contamination was recorded during the ground investigation. We would conclude therefore that the risk to the site development from ground contamination is low.

8.3 However, it has been considered prudent to adopt a precautionary principal and analyse selected samples of the sub-surface soils to confirm the anticipated low human health and groundwater risk status of the site.

Human Health

8.4 Selected samples have been analysed for a general suite of contaminants of concern and compared against Generic Assessment Criteria (GAC) for human health to determine the significance of the measured concentrations in relation to the site conceptual model. Thus a Generic Quantitative Risk Assessment has been undertaken in line with guidelines provided in CLR11, Model Procedures for the Management of Land Contamination, 2004.GQRA).

8.5 The GAC used in the assessment primarily comprise published Soil Guideline Values (SGV) and values that have been derived using the Contaminated Land Exposure Assessment (CLEA) guidance as provided by DEFRA and the EA. In the latter case, values derived by Land Quality Management Limited (LQM) on behalf of the Chartered Institute of Environmental Health (CIEH) and presented in their publication 'Generic Assessment Criteria for Human Health Risk Assessment', 2009, have been used. Where contaminants are not covered by the above guidelines, GAC have been sourced from previously withdrawn SGV's as a preliminary assessment.

8.6 As the proposed development comprises an industrial use, comparison is made against the criteria for a "Commercial" standard land-use as defined in the CLEA guidance.

Controlled Waters

8.7 GAC for the assessment of leachable contaminants have been derived from the following:

- UK Drinking Water Standards as defined by The Water Supply (Water Quality) Regulations 2000;
- UK Environmental Quality Standards (EQS).

Results

8.8 A table of GAC protective of human health for a "commercial" end use scenario is provided in Appendix 07. Comparison of results against the GAC indicates that all test results fall well below the criteria for a "commercial" end-use scenario. The risk to human health posed by the site is therefore considered low with no further action is required in this respect.

8.9 However, the levels of contaminants render the made ground unsuitable for use in the proposed landscaped area in the west of the site, particularly with respect to phytotoxic elements which could potentially inhibit plant growth.

8.10 A nominal 600mm cover of clean sub-soil and topsoil will therefore be required in the proposed landscaped area with the thickness being increased, in consultation with a tree specialist, where the planting of trees is proposed.

8.11 Contamination levels in the peat are such that the material is considered suitable for re-use in the landscaped area. Its inherently high organic content also renders it suitable as a growing medium following a degree of blending with excavated natural granular soils.

8.12 Comparison of the leachate test results against the conservative drinking water standards indicates that PAH is elevated above the standard required at the consumer's taps.

8.13 However, the site will be covered almost entirely by relatively impermeable surface materials thus significantly reducing any mechanism for leaching and subsequent downward migration of contaminants. In addition, the site is underlain by relatively impermeable Glacial Till which will prevent vertical migration of potentially mobile contaminants into the underlying Principal Aquifer. The risk to the underlying aquifer is therefore considered negligible.

9.0 GROUND GAS RISK ASSESSMENT

Methodology

9.1 Current guidance for the assessment of risk associated with the presence of hazardous ground gases (principally methane and carbon dioxide) is provided in two key documents, namely:

- Code of practice for the Characterisation and remediation from Ground Gas in Affected Developments. British Standard Institution (BS 8485: 2007); and
- Assessing Risks posed by Hazardous Ground Gases to Buildings CIRIA (C665, 2007).

9.2 Hazardous ground gas qualitative risk assessment is based on a conceptual model similar to that used for soil and groundwater contamination sources (i.e., source-pathway-receptor pollutant linkages). A semi-quantitative estimate of risk can be assessed based on knowledge of the conceptual model and a measure of hazardous gas concentration and gas flow at the site within monitoring standpipes.

9.3 Based on the measured flow rates and hazardous gas concentrations, individual "hazardous gas flow rates" (Q_{hg}) can be derived for each monitoring point, from which the "site characteristic hazardous gas flow rate" (Q_{hgs}), and then the "Characteristic Situation" can be determined.

9.4 BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation and the type of development (e.g. non-managed property such as private housing, or managed properties such as public buildings, commercial buildings or industrial buildings).

Ground Gas Conceptual Model

9.5 The site is not in an area recorded as being affected by naturally occurring radon gas.

9.6 The Desk Study report indicates that there are no recorded operational or closed landfills within influencing distance of the site.

9.7 Peat, which is a degradable material with the potential to generate significant concentrations of ground gas, has been identified in the ground investigations.

9.8 The underlying geology does not include Coal Measures strata which could have the potential to release hazardous ground gas.

9.9 The preliminary risk to the development from methane and carbon dioxide ground gas has been assessed as low although the presence of peat identified within the recent investigations now provides a moderate perceived risk if the material is left in place. It has therefore been considered prudent to confirm this by undertaking ground gas monitoring, with associated flow rates. To date, monitoring has been undertaken on two occasions on 13th December 2011 and 3rd January 2012.

9.10 The results indicate that no detectable levels of methane are present with a maximum carbon dioxide concentration of 3.1% by volume in air (v/v). No measurable positive flow rates have been recorded in the monitoring wells.

9.11 The Hazardous Gas Flow Rate, calculated from peak concentrations and flow is therefore 0.0024l/hr. On this basis and in consideration of the gas concentrations, the site would fall into Characteristic Situation 1 as indicated in BS8485, confirming a low gas risk.

9.12 Under this circumstance, no specific gas protection measures would be required for the proposed development structure in terms of methane and carbon dioxide gas. This will need to be confirmed by further ground gas monitoring over a minimum period of 3 months.

10.0 OTHER POTENTIAL DEVELOPMENT CONSIDERATIONS

Waste Soils Characterisation

10.1 Excavation works undertaken during the development are likely to produce waste soils for which appropriate waste management will be required. Excavated peat will be suitable for re-use in landscaped areas but may be subject to on-site blending with natural soils to provide an appropriate growing medium. This may need to be confirmed by a suitably qualified soil specialist.

10.2 Surplus soils arising from the site will require off-site disposal under careful management and due consideration of appropriate legislation, guidance and Duty of Care responsibilities.

10.3 Natural sand and gravel soils are likely to be classified as inert for disposal purposes while made ground and peat will most likely classify as non-hazardous. It cannot be discounted that localised areas of hydrocarbon contaminated soils may be present and, if requiring disposal, could be classified as hazardous waste.

11.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

General

11.1 It appears that the site has not been subject to significant industrial development during its history. Notwithstanding this, given the site's current use for storage and parking, together with its setting within a heavy industrial environment, some degree of ground contamination cannot be discounted. However, ground investigations indicate that ground contamination, including the presence of ground gas, is not widespread.

11.2 The overall contamination risk is therefore considered low with no further action considered necessary with the exception of a nominal 600mm clean soil cover in the proposed landscaped area. In addition, further monitoring is being undertaken to confirm the low anticipated risk from ground gas.

11.3 Near surface made ground and peat deposits are not considered suitable for the direct support of structural loads. Allowable bearing pressures in the underlying Glaciofluvial sand and gravel deposits should be limited to 75kPa due to the shallow groundwater conditions. However, as relatively high structural loads may be envisaged locally on the floor slab ground improvement by vibro techniques is recommended, provided the layer of peat is removed from beneath the structure.

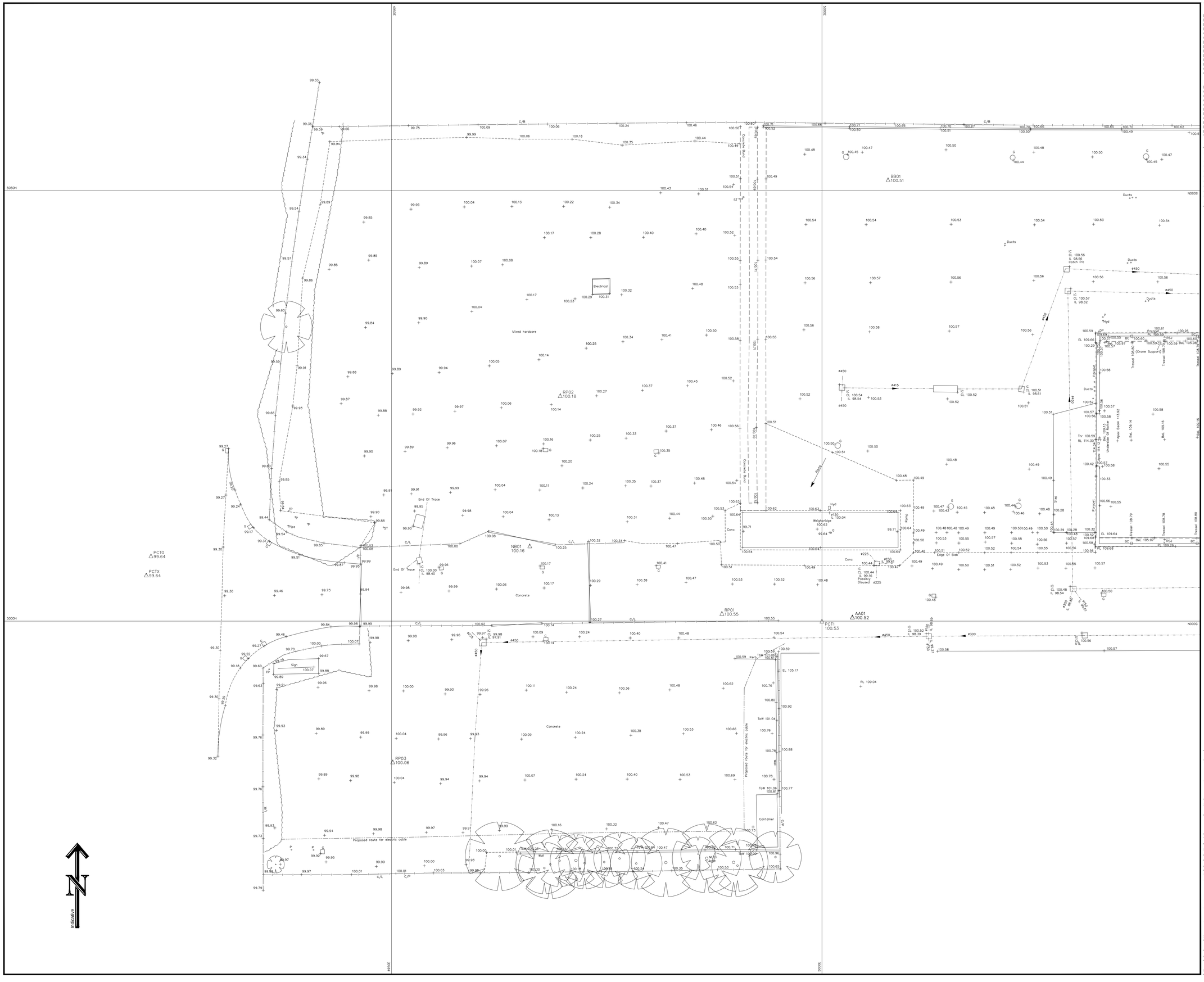
11.4 Results of 2:1 water/soil extract for sulphate range all fall below the laboratory detection limit of 0.1g/l. Values of pH range from around 6.5 to 9.5. On the basis of these results, the typical design sulphate (DS) class and "Aggressive Chemical Environment for Concrete" (ACEC) class for the site are DS-1 and AC-1 respectively.

11.5 Due to the variable nature of the made ground, it is advisable to adopt a CBR of no more than 5% for design purposes. In addition, consideration should be given to the removal of peat where this occurs beneath proposed external pavements as the potential for continued consolidation of the material could lead to unacceptable total and differential settlements at the surface.

11.6 Natural sand and gravel soils are likely to be classified as inert for disposal purposes while made ground and peat will most likely classify as non-hazardous. It cannot be discounted that localised areas of hydrocarbon contaminated soils may be present and, if requiring disposal, could be classified as hazardous waste.

APPENDIX 01

Drawings



Topographical Survey Legend

B	Bollard	GV	Gas valve	rwp	Rain water pipe	Level prefix descriptions	
Bin	Litter bin	Hyd	Hydrant	SP	Soil pipe	AL	Arch level
BS	Bus stop	IC	Inspection cover	ST	Stop tap	BL	Bed level
BT	British telecom ic	JB	Junction box	Stay	Cable stay	CL	Cover level
CPS	Concrete paving slabs	KO	Kerb outlet	SV	Stop valve	EL	Eaves level
CTV	Cable television cover	LB	Letter box	TCB	Telephone call box	FL	Floor level
DR	Drain	LP	Lamp post	TL	Traffic light	IL	Invert level
Elec	Electrical ic	Mkr	Utility marker	TP	Telegraph pole	PL	Parapet level
EP	Elec. pole	MP	Mile post	TPS	Tactile paving slabs	RL	Roof/ridge level
ER	Earth rod	NP	Name plate	VP	Vent pipe	SL	Soffit level
FP	Flagpole	P	Post	WM	Water meter	Spr	Arch springing level
FT	Floodlight	PM	Parking meter	WO	Water outlet	ToW	Top of wall level
G	Gully	RE	Rodding eye	UTL	Unable to lift	Thr	Threshold level
GP	Gate post	RS	Road sign			WL	Water level

Fence annotation
B/W Barbed wire
C/B Closed boarded
C/I Corrugated iron
C/L Chain link
C/P Concrete panel
H/R Hand rail
I/R Iron railings
O/B Open boarded
P/C Post & chain
P/R Post & rail
P/W Post & wire
W/M Wire mesh

Levels defining edge of carriageway are observed at channel (bottom of kerb). Unless otherwise stated.

Drainage/Services Legend

Surface water	Oil pipe	Borehole	Monitoring well	ass	Assumed route
Foul sewer	Steam Pipe			cut	Service cut
Unspecified sewer				d	Service depth (m)
Electric				ø	Pipe diameter (mm)
Gas pipe				end	End of run
Telecommunications		Probe Hole	Trial Pit	utf	Unable to trace further
Water pipe				nd	No depth recorded
Misc / unknown service				rec	From records

Drainage pipe sizes (where shown) have been gauged from the surface for safety reasons and should be regarded as approximate only.

Survey Station Coordinates

Stn	Easting	Northing	Level
PCT7	5146.24	5007.17	100.56
PCTX	4921.51	5005.36	99.64
RP01	4988.38	5000.89	100.55
RP02	4969.59	5026.20	100.18
RP03	4950.14	4983.65	100.06

Head and Registered Office
Willow Bank House
Old Road
Handforth • Wilmslow
Cheshire SK9 3AZ
Tel. 01625 533444
Fax 01625 526815
Email: mail@surveys.co.uk
Web: www.surveys.co.uk

Levels are related to **TBM**
Value **100.00m**
Site Datum

Coordinates are related to **Site Grid**

Scale **1:200**

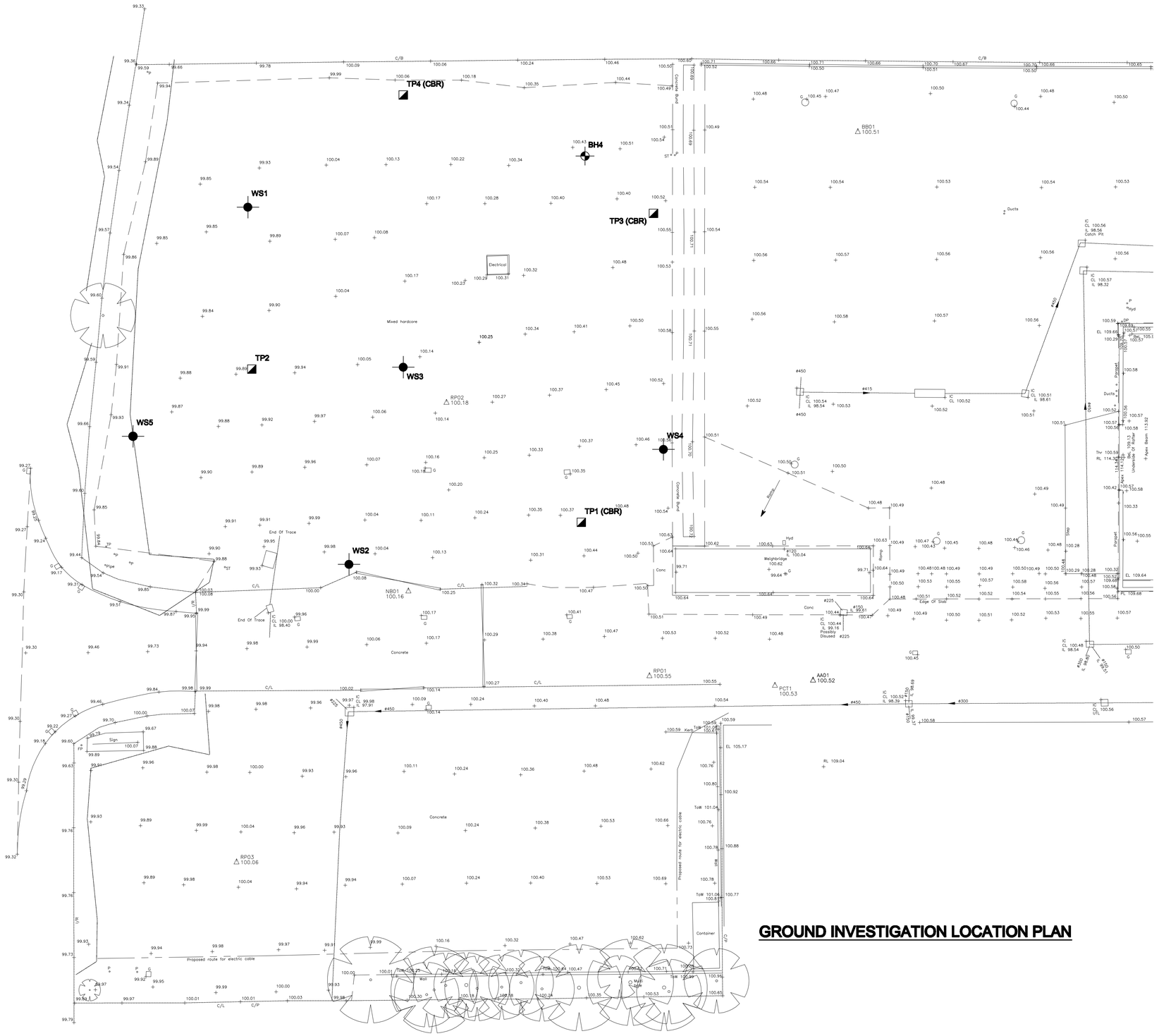
0 2 4 6 8 10 12 14 16 18
metres

Client Axion Polymers

Title
Topographical Survey
S. Norton & Co. Site
Tenax Road
Trafford Park

Surveyed RP JBELL
Drawn dlp
Date November 2011
Checked RP
CAD file name 13166D
Revision No.
Sheet size A1

Drawing No. **SSL:13166D:200:1:1**



GROUND INVESTIGATION LOCATION PLAN

GENERAL NOTES

1. DO NOT SCALE FROM THIS DRAWING WORK TO FIGURED DIMENSIONS ONLY.
2. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS ALLOWED WITHOUT PRIOR PERMISSION IN WRITING.
3. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.
4. THE CONTRACTOR SHALL INCORPORATE ALL THE REQUIREMENTS OF THE PRE-TENDER STAGE HEALTH & SAFETY PLAN.

KEY:

TP2	LOCATION OF WML TRIAL PIT
TP1 (CBR)	LOCATION OF WML TRIAL PIT WITH CBR AT 0.5m DEPTH.
WS1	LOCATION OF WML WINDOW SAMPLE PROBE
BH4	APPROX.LOCATION OF CC GEOTECHNICAL BOREHOLE (B44) 2009

PRELIMINARY DRAWING

Rev.	Amendment	Date	By	Chkd
P1	PRELIMINARY ISSUE.	13-01-12	ZH	PD

Project
S NORTON AND CO, TENAX ROAD, TRAFFORD PARK

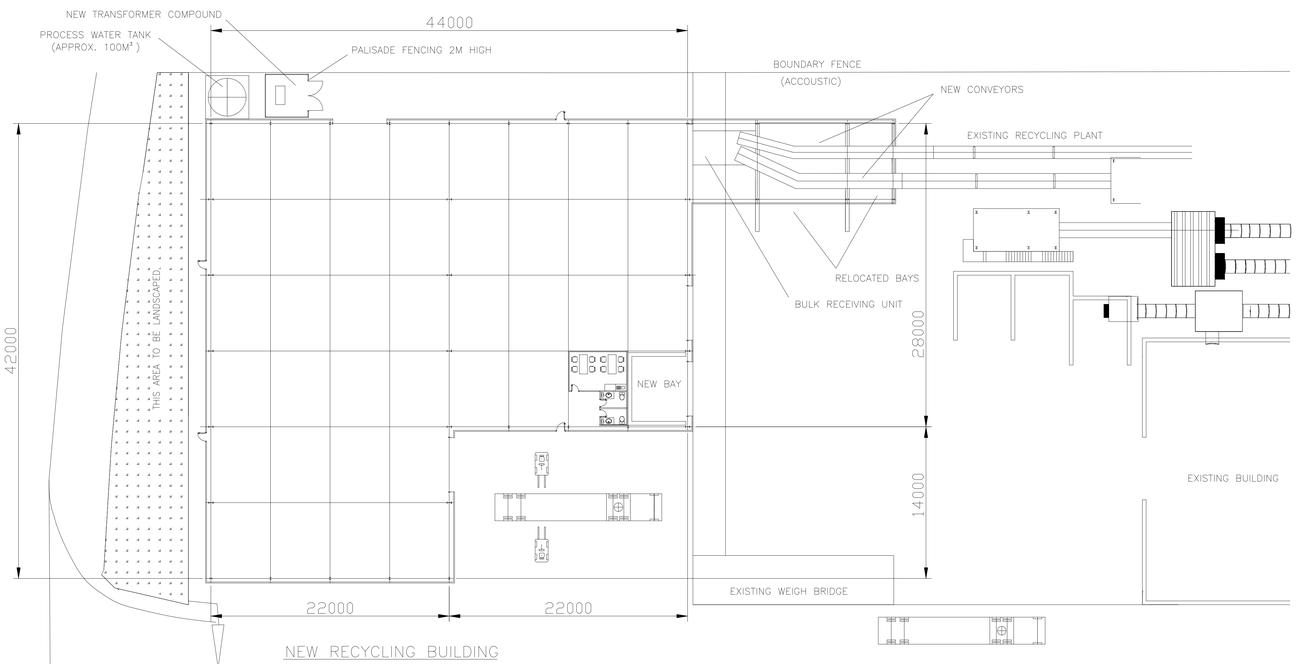
Client
AXION RECYCLING LTD

Title
GROUND INVESTIGATION LOCATION PLAN

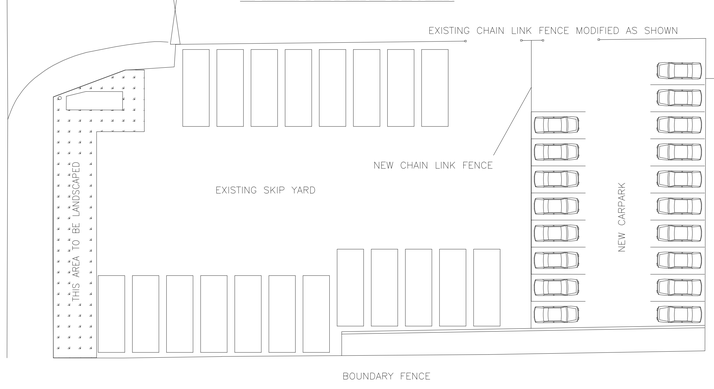
Drawn	Checked	Date	Scale
ZH	PD	JAN'11	1:200 @ A1

WML CONSULTING
Chartered Civil and Structural Engineers
No.8 Oak Green
Earl Road
Stanley Green Business Park
Cheadle Hulme
Cheshire SK8 6QL
Tel 0161 482 0800
Fax 0161 486 8210
e-mail info@wmlconsulting.com
www.wmlconsulting.com

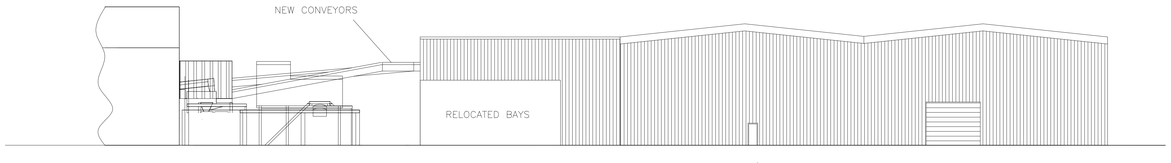
Job No.	Drawing No.	
5044G	E01	P1



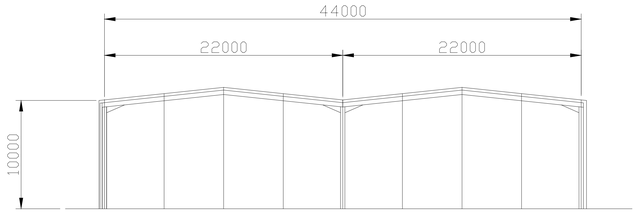
NEW RECYCLING BUILDING



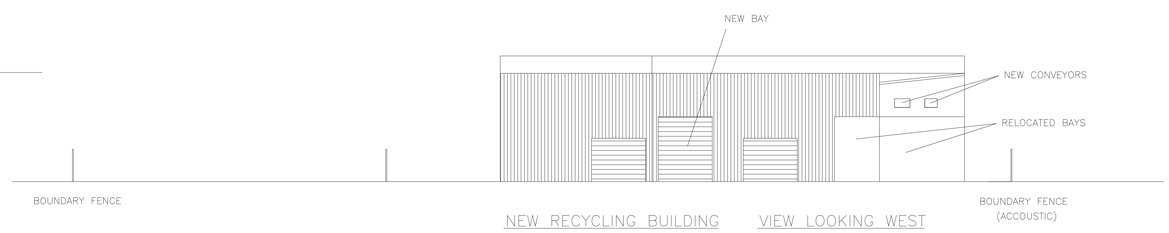
NEW RECYCLING BUILDING VIEW LOOKING NORTH



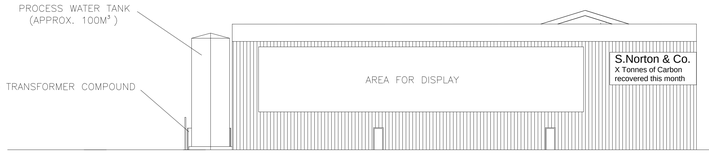
VIEW LOOKING SOUTH NEW RECYCLING BUILDING



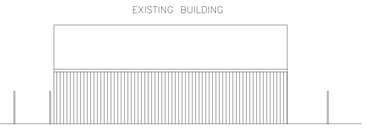
TYPICAL CROSS SECTION



NEW RECYCLING BUILDING VIEW LOOKING WEST



NEW RECYCLING BUILDING VIEW LOOKING EAST



COLOUR DESIGNATION	
ITEM	COLOUR
CONVEYOR PANELS	GALVANISED STEEL FINISH (GREY)
ACCESS WALKWAYS AND LADDERS	GALVANISED STEEL FINISH (GREY)
STRUCTURAL STEELWORK	GALVANISED STEEL FINISH (GREY)
CONVEYOR CHUTE	GOOSEWING GREY – RAL7038
CLADDING	GOOSEWING GREY – RAL7038
PROCESS EQUIPMENT	GOOSEWING GREY – RAL7038
CONVEYOR COVERS	BLACK
BAYS	STEEL FINISH (UNCOATED!)

100 Metres

0M 10M 20M 30M 40M 50M 60M 70M 80M 90M 100M

DO NOT SCALE

ISSUE No	MODIFICATION	DRAWN	CHK'D	APP'D	DATE

TITLE
PROPOSED RECYCLING PLANT
TRAFFORD PARK

axionconsulting

DRAWN DJB	SCALE 1:200	
CHECKED	DATE 09/12/11	
APPROVED		
DRAWING No AX/SWAPP/0001	ISSUE No. F	

TUDOR HOUSE
MEADWAY
BRAMHALL
STOCKPORT
SK7 2DG
TEL No. 0161-426-7731
FAX No. 0161-426-7732

APPENDIX 02

Window Sampling Logs

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Number
Tenax Road, Trafford Park, Manchester	WS1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Axion Consulting	12-389
	Location	**Dates** 08/12/2011	**Engineer** Wright Mottershaw Lydon Consulting Limited	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.10) 0.10	MADE GROUND : tarmac			
0.20	D				(0.20) 0.30	MADE GROUND : broken brick			
0.60	D				(0.40) 0.70	MADE GROUND : pulverised fuel ash			
1.00-1.45	SPT(C) N=10		2,2/2,2,3,3			Loose / medium dense grey / yellow SAND			
1.00-1.45	D				(1.70)				
2.00-2.45	D		Seepage(1) at 2.00m.					▽1	
2.00-2.45	SPT(C) N=13		2,2/3,3,3,4		2.40				
						Loose grey medium SAND with occasional fine sub-rounded gravel			
3.00-3.45	SPT(C) N=7		1,2/2,2,2,1						
3.00-3.45	D				(2.05)				
4.00-4.45	SPT(C) N=6		1,2/2,1,1,2						
4.00-4.45	D				4.45				
						Complete at 4.45m			

Remarks
Services inspection pit excavated by hand to 1.00m

Scale (approx)	Logged By
1:50	J. Crook

Figure No. 12-389.WS1

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Number
Tenax Road, Trafford Park, Manchester	WS2

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Axion Consulting	12-389
	Location	**Dates** 08/12/2011	**Engineer** Wright Mottershaw Lydon Consulting Limited	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.10)	MADE GROUND : tarmac			
					0.10				
0.20	D				(0.50)	MADE GROUND : broken brick			
					0.60				
0.70	D				(0.30)	MADE GROUND : black sand / clay / ash			
					0.90				
1.00-1.45	SPT(C) N=11		2,3/2,3,3,3			Medium dense brown / grey fine / medium SAND			
1.00	D								
1.00-1.45	D								
					(1.30)				
2.00	D		Seepage(1) at 2.00m.					▽1	
2.00-2.45	SPT(C) N=10		2,3/2,3,2,3		2.20				
2.00-2.45	D					Loose grey medium slightly gravelly SAND			
2.50	D								
3.00-3.45	SPT(C) N=5		1,2/1,2,1,1						
3.00	D								
3.00-3.45	D				(2.25)				
4.00-4.45	SPT(C) N=4		1,1/1,1,1,1						
4.00	D								
4.00-4.45	D								
					4.45				
						Complete at 4.45m			

Remarks
Services inspection pit excavated by hand to 1.00m

Scale (approx)	Logged By
1:50	J. Crook

Figure No. 12-389.WS1

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Number
Tenax Road, Trafford Park, Manchester	WS3

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Axion Consulting	12-389
	Location	**Dates** 08/12/2011	**Engineer** Wright Mottershaw Lydon Consulting Limited	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.10) 0.10	MADE GROUND : tarmac			
						MADE GROUND : broken brick			
0.50	D				(0.70) 0.80				
						Firm brown /black amorphous PEAT			
1.00-1.45	SPT(C) N=16		3,3/4,4,4,4		(0.60) 1.40				
1.00-1.45	D					Medium dense grey fine / medium SAND			
					(0.80) 2.20			▽1	
2.00-2.45	D		Seepage(1) at 2.00m.						
2.00-2.45	SPT(C) N=16		3,3/4,4,4,4						
2.20	D					Very loose / loose grey medium SAND with fine / medium sub-rounded gravel			
3.00-3.45	SPT(C) N=5		1,2/2,1,1,1						
3.00-3.45	D				(2.25)				
4.00-4.45	SPT(C) N=2		2,1/0,1,0,1						
4.00-4.45	D				4.45				
						Complete at 4.45m			

Remarks
Services inspection pit excavated by hand to 1.00m

Scale (approx)	Logged By
1:50	J. Crook

Figure No. 12-389.WS1

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Number
Tenax Road, Trafford Park, Manchester	WS4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Axion Consulting	12-389
	Location	**Dates** 08/12/2011	**Engineer** Wright Mottershaw Lydon Consulting Limited	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.10)	MADE GROUND : tarmac		
					0.10			
0.20	D				(0.40)	MADE GROUND : broken brick		
					0.50			
0.60	D					Firm black amorphous PEAT		
					(0.70)			
1.00-1.45	SPT(C) N=6		1,1/2,1,2,1					
1.00-1.45	D				1.20			
1.30	D					Loose / medium dense grey medium SAND		
2.00-2.45	D		Seepage(1) at 2.00m.					▽1
2.00-2.45	SPT(C) N=14		3,3/3,3,4,4					
					(2.80)			
3.00-3.45	SPT(C) N=6		1,2/2,1,2,1					
3.00-3.45	D							
					4.00			
4.00-4.45	SPT(C) N=5		1,1/1,1,1,2			Loose grey coarse SAND and fine / medium sub-rounded GRAVEL		
4.00-4.45	D				(0.45)			
					4.45			
						Complete at 4.45m		

Remarks
Services inspection pit excavated by hand to 1.00m

Scale (approx)	Logged By
1:50	J. Crook

Figure No. 12-389.WS1

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Number
Tenax Road, Trafford Park, Manchester	WS5

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Axion Consulting	12-389
	Location	**Dates** 08/12/2011	**Engineer** Wright Mottershaw Lydon Consulting Limited	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.05) 0.05	MADE GROUND : tarmac		
0.20	D				(0.55)	MADE GROUND : broken brick		
0.60	D				0.60	Medium dense grey medium SAND		
1.00-1.45	SPT(C) N=16		3,3/4,4,4,4					
1.00	D							
1.00-1.45	D							
					(2.30)			
2.00-2.45	D		Seepage(1) at 2.00m.					▽1
2.00-2.45	SPT(C) N=16		3,4/4,4,4,4					
					2.90			
3.00-3.45	SPT(C) N=9		1,1/1,2,3,3			Very loose / loose grey gravelly medium SAND		
3.00-3.45	D							
					(1.55)			
4.00-4.45	SPT(C) N=5		1,1/1,1,1,2					
4.00-4.45	D							
					4.45			
						Complete at 4.45m		

Remarks
Services inspection pit excavated by hand to 1.00m

Scale (approx)	Logged By
1:50	J. Crook

Figure No. 12-389.WS1

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Standard Penetration Test Results

Site : Tenax Road, Trafford Park, Manchester

Client : Axion Consulting

Engineer : Wright Mottershaw Lydon Consulting Limited

Job Number 12-389

Sheet 1 / 1

Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
WS1	1.00	1.15	1.45	CPT	2	2	2	2	3	3	N=10	
WS1	2.00	2.15	2.45	CPT	2	2	3	3	3	4	N=13	
WS1	3.00	3.15	3.45	CPT	1	2	2	2	2	1	N=7	
WS1	4.00	4.15	4.45	CPT	1	2	2	1	1	2	N=6	
WS2	1.00	1.15	1.45	CPT	2	3	2	3	3	3	N=11	
WS2	2.00	2.15	2.45	CPT	2	3	2	3	2	3	N=10	
WS2	3.00	3.15	3.45	CPT	1	2	1	2	1	1	N=5	
WS2	4.00	4.15	4.45	CPT	1	1	1	1	1	1	N=4	
WS3	1.00	1.15	1.45	CPT	3	3	4	4	4	4	N=16	
WS3	2.00	2.15	2.45	CPT	3	3	4	4	4	4	N=16	
WS3	3.00	3.15	3.45	CPT	1	2	2	1	1	1	N=5	
WS3	4.00	4.15	4.45	CPT	2	1	0	1	0	1	N=2	
WS4	1.00	1.15	1.45	CPT	1	1	2	1	2	1	N=6	
WS4	2.00	2.15	2.45	CPT	3	3	3	3	4	4	N=14	
WS4	3.00	3.15	3.45	CPT	1	2	2	1	2	1	N=6	
WS4	4.00	4.15	4.45	CPT	1	1	1	1	1	2	N=5	
WS5	1.00	1.15	1.45	CPT	3	3	4	4	4	4	N=16	
WS5	2.00	2.15	2.45	CPT	3	4	4	4	4	4	N=16	
WS5	3.00	3.15	3.45	CPT	1	1	1	2	3	3	N=9	
WS5	4.00	4.15	4.45	CPT	1	1	1	1	1	2	N=5	

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Borehole Number
Tenax Road, Trafford Park, Manchester	**WS1**

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 35 mm Diameter of Filter Zone = 70 mm	Axion Consulting	12-389

Location	Ground Level (mOD)	Engineer	Sheet
		Wright Mottershaw Lydon Consulting Limited	1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
				0.10	Concrete
					Bentonite Seal
				1.00	
	▽1				
					Well Screen
				4.00	
					Bottom Fill
				4.45	

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
08/12/11		2.00		Seepage					

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)

Instrument Groundwater Observations

Inst. [A] Type : Slotted Standpipe

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks

Remarks

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Borehole Number
Tenax Road, Trafford Park, Manchester	WS2

Installation Type	Dimensions	Client	Job Number
Single Installation	Internal Diameter of Tube [A] = 35 mm Diameter of Filter Zone = 70 mm	Axion Consulting	12-389

Location	Ground Level (mOD)	Engineer	Sheet
		Wright Mottershaw Lydon Consulting Limited	1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
				0.10	Concrete
					Bentonite Seal
				1.00	
	▽1				
					Well Screen
				3.50	
					Bottom Fill
				4.45	

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
08/12/11		2.00		Seepage					

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)

Instrument Groundwater Observations

Inst. [A] Type : Slotted Standpipe

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks

Remarks

GEO-VENTURES (UK) LIMITED
Geotechnical and Environmental Services

Site	Borehole Number
Tenax Road, Trafford Park, Manchester	WS3

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 35 mm
Diameter of Filter Zone = 70 mm

Client
Axion Consulting

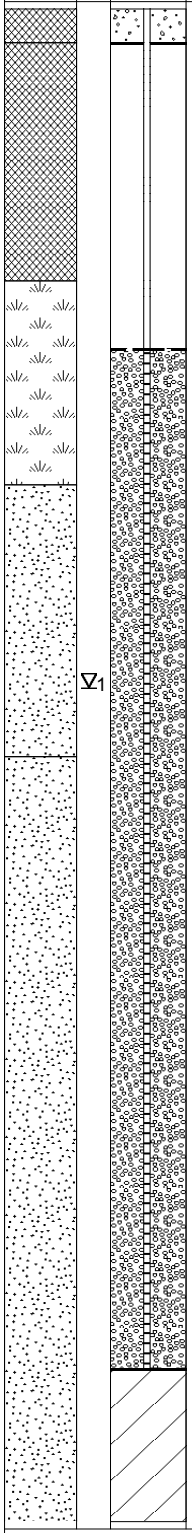
Job Number
12-389

Location

Ground Level (mOD)

Engineer
Wright Mottershaw Lydon Consulting Limited

Sheet
1/1



Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
08/12/11		2.00		Seepage					

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)

Instrument Groundwater Observations

Inst. [A] Type : Slotted Standpipe

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks

Remarks

APPENDIX 03

Geotechnical Soil Test Results

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL06/3605

Client's Reference: Report Date: 07 December 2011

Client Name: Geo-Ventures (UK) Limited
70 Riverside Close
Waterside
Howley
Warringtonm
WA1 2JD

For the attention of: Paul Platt

Contract Title: S. Norton, Trafford Park

Date Received: 06-December-11
Date Commenced: 06-December-11
Date Completed: 07-December-11

Notes: **Observations and Interpretations are outside the UKAS Accreditation**

Checked and Approved Signatories:

R Gunson	A Watkins	M Beastall
(Director)	(Director)	(Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
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fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

PSL
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Independent Laboratory Testing Services.

Professional Soils Laboratory
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e-mail: awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

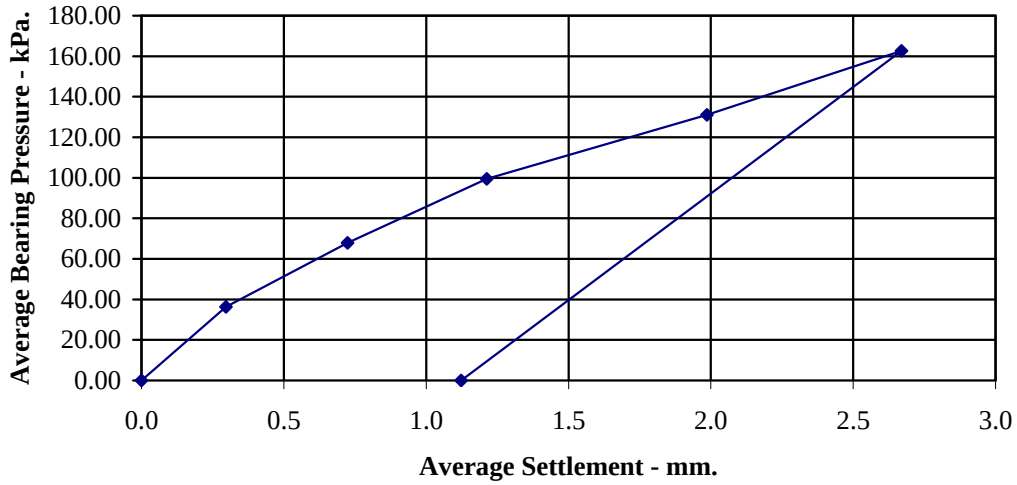
BS 1377 : Part 9 : 1990.

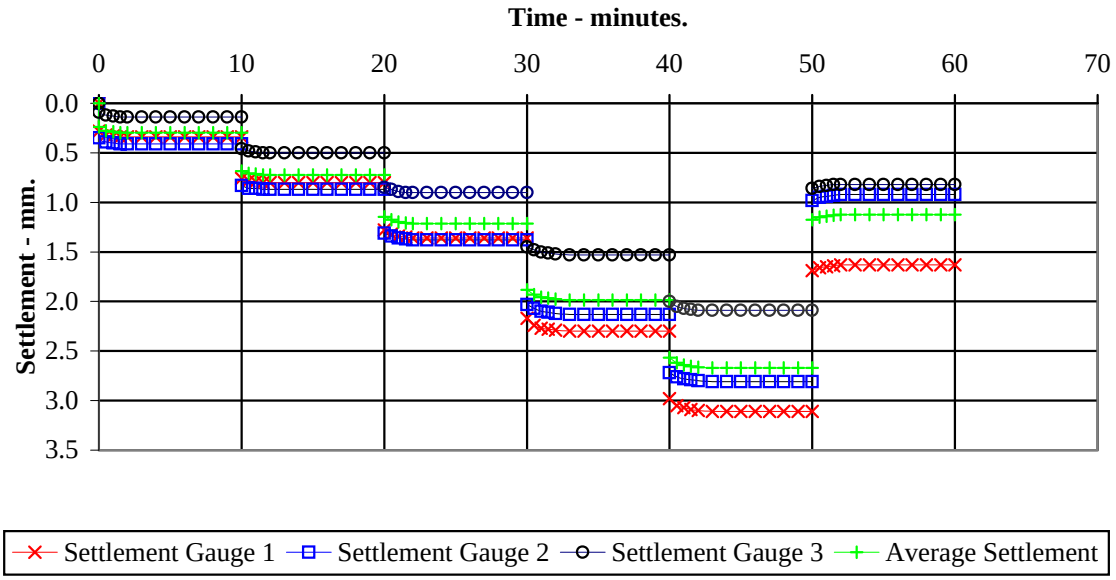
Date of Test: 06-Dec-11

Test Position: TP1 **Depth (m):** 0.50

Plate Area (m2): 0.2827433 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 162.71
Maximum Deformation (mm): 2.67
Description: MADE GROUND brick & sand fill





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	07/12/11		07/12/11		07/12/11	PSL11/3605

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PSL
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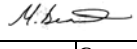
Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**6-Dec-11**	
Test Position	**TP1**	
Depth (m)	**0.50**	
Description	**MADE GROUND brick & sand fill**	
Maximum Deflection	**2.67**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load(@1.25mm)	**102.0**	**kN/m^2**
Plate diameter	**600**	**mm**
Conversion factor for plate diameter	**0.804**	
K_{762}(modulus of subgrade reaction)	**65.6**	**kN/m^2/mm**
CBR Value	**13.6**	**%**

Checked/Approved	Date
	07/12/11

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Independent Laboratory Testing Services.

Professional Soils Laboratory
5 -7 Hexthorpe Road
Hexthorpe
Doncaster, DN4 0AG.
tel: 0844 8156641 . fax: 0844 8156642
e-mail: awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

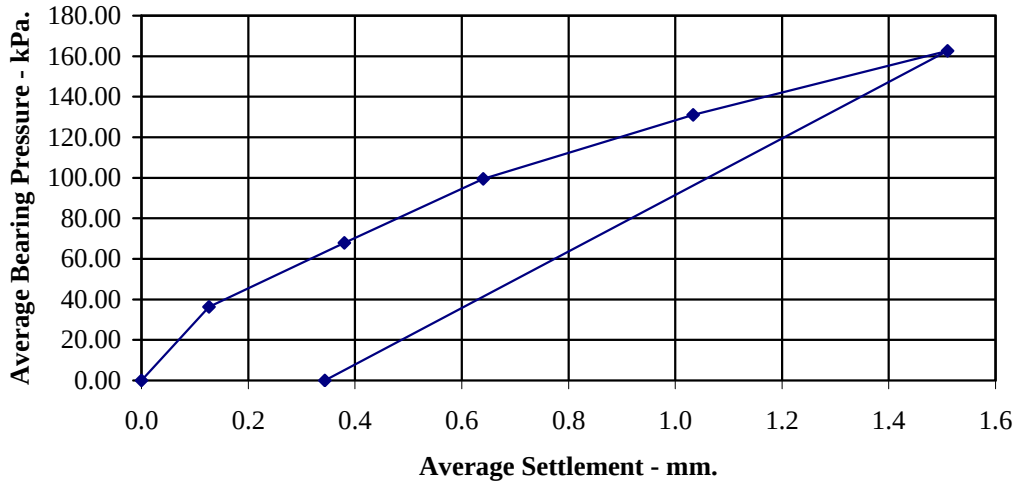
BS 1377 : Part 9 : 1990.

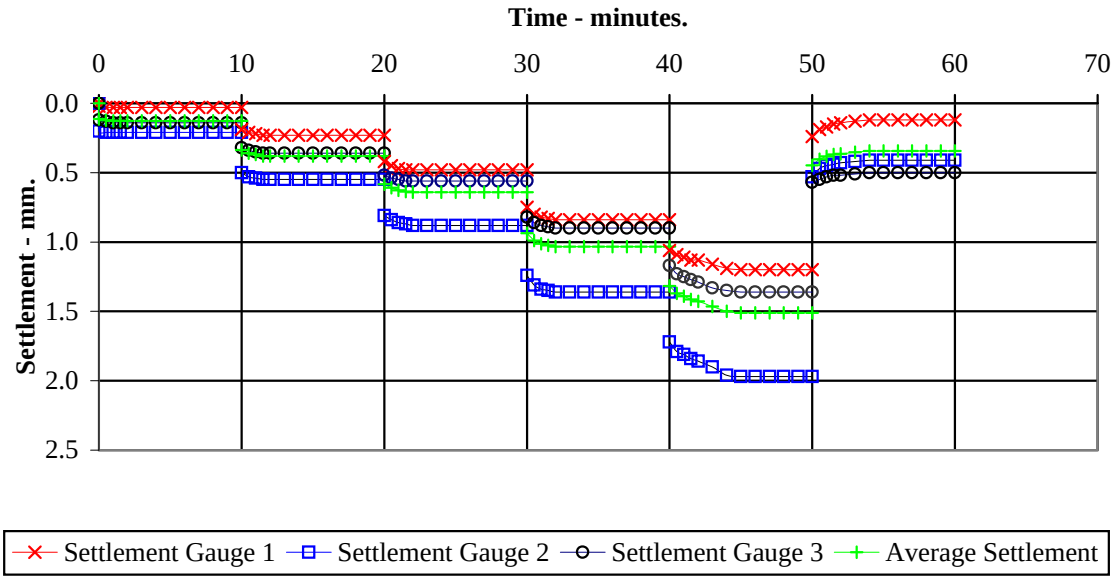
Date of Test: 06-Dec-11

Test Position: TP3 **Depth (m):** 0.50

Plate Area (m2): 0.2827433 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 162.71
Maximum Deformation (mm): 1.51
Description: MADE GROUND brick & sand fill





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	07/12/11		07/12/11		07/12/11	PSL11/3605

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Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**6-Dec-11**	
Test Position	**TP3**	
Depth (m)	**0.50**	
Description	**MADE GROUND brick & sand fill**	
Maximum Deflection	**1.51**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load(@1.25mm)	**145.0**	**kN/m^2**
Plate diameter	**600**	**mm**
Conversion factor for plate diameter	**0.804**	
K_{762}(modulus of subgrade reaction)	**93.3**	**kN/m^2/mm**
CBR Value	**25.0**	**%**

Checked/Approved	Date
M. Norton	07/12/11

S.NORTON, TRAFFORD PARK.	**Contract No.** **PSL11/3605**

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Independent Laboratory Testing Services.

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5 -7 Hexthorpe Road
Hexthorpe
Doncaster, DN4 0AG.
tel: 0844 8156641 . fax: 0844 8156642
e-mail: awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

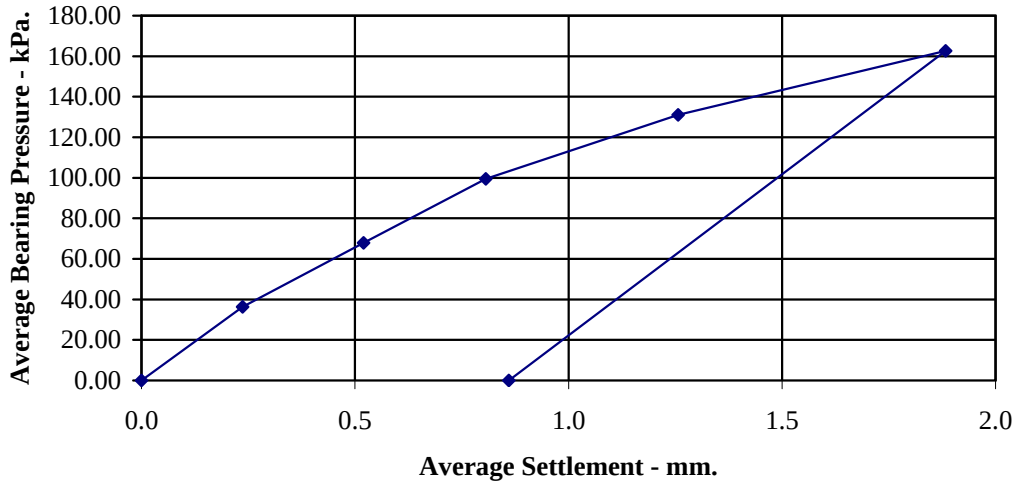
BS 1377 : Part 9 : 1990.

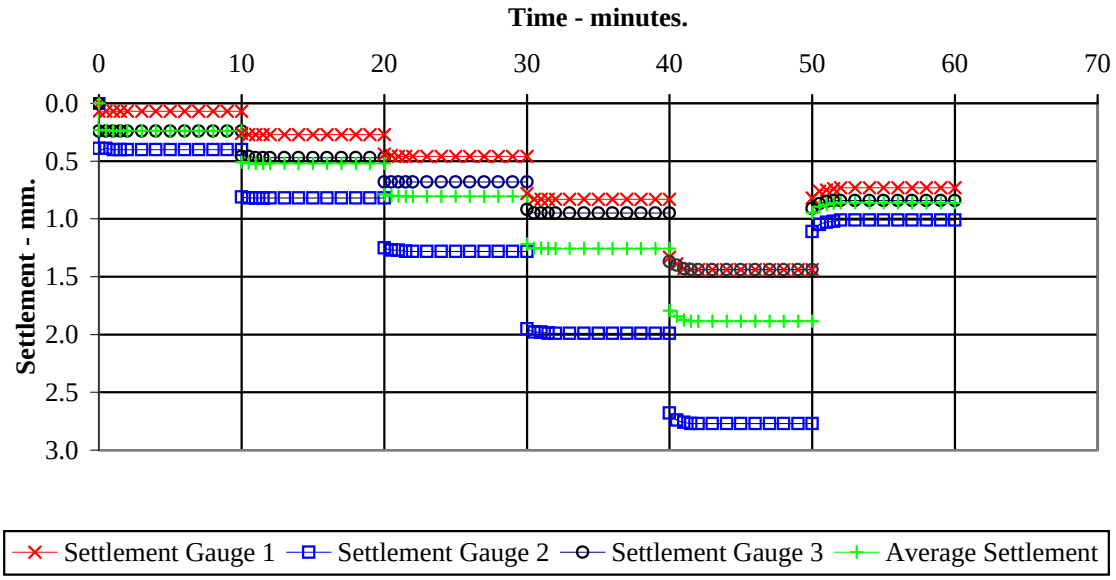
Date of Test: 06-Dec-11

Test Position: TP4 **Depth (m):** 0.50

Plate Area (m2): 0.2827433 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 162.71
Maximum Deformation (mm): 1.88
Description: MADE GROUND brick & sand fill





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	07/12/11		07/12/11		07/12/11	PSL11/3605

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tel: 0844 8156641
fax: 0844 8156642

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**6-Dec-11**	
Test Position	**TP4**	
Depth (m)	**0.50**	
Description	**MADE GROUND brick & sand fill**	
Maximum Deflection	**1.88**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load(@1.25mm)	**131.0**	**kN/m^2**
Plate diameter	**600**	**mm**
Conversion factor for plate diameter	**0.804**	
K_{762}(modulus of subgrade reaction)	**84.3**	**kN/m^2/mm**
CBR Value	**21.0**	**%**

Checked/Approved	Date
M. Norton	07/12/11

S.NORTON, TRAFFORD PARK.	**Contract No.** **PSL11/3605**

APPENDIX 04

Chemical Test Results

Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 261783-1

Date of Report: 05-Jan-2012

Customer: WML Consulting Ltd
8 Oak Green Earl Road
Stanley Green Business Park
Cheadle Hulme
Cheshire
SK8 6QL

Customer Contact: Mr Peter Davies

Customer Job Reference: 5044G
Customer Purchase Order: 5044G
Customer Site Reference: Tenax road, Trafford Park
Date Job Received at SAL: 19-Dec-2011
Date Analysis Started: 21-Dec-2011
Date Analysis Completed: 05-Jan-2012

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

UKAS TESTING
1549

Report checked
and authorised by :
Mr Ross Walker
Customer Services Manager
(Land)

Issued by :
Mr Ross Walker
Customer Services Manager
(Land)

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Soil Analysed as Soil
WML Basic Suite

				SAL Reference	**261783 001**	**261783 002**	**261783 003**	**261783 004**	**261783 005**	**261783 008**	**261783 009**
				Customer Sample Reference	**TP1 0.8**	**TP2 0.5**	**TP3 1.0**	**TP4 0.3**	**WS2 0.7**	**WS4 0.6**	**WS4 2.0**
				Date Sampled	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**							
Arsenic	T6	AR	1	mg/kg	**36**	**88**	**19**	**9**	**28**	**9**	**2**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	AR	1	mg/kg	<1	<1	<1	<1	**2**	**1**	<1
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1
Copper	T6	AR	1	mg/kg	**150**	**82**	**38**	**31**	**1400**	**2**	**24**
Lead	T6	AR	1	mg/kg	**100**	**48**	**120**	**230**	**280**	**84**	**10**
Mercury	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	AR	1	mg/kg	**55**	**42**	**12**	**10**	**24**	**10**	**16**
Selenium	T6	AR	3	mg/kg	<3	<3	<3	<3	<3	<3	<3
Vanadium	T6	AR	1	mg/kg	**49**	**77**	**17**	**17**	**39**	**12**	**8**
Zinc	T6	AR	1	mg/kg	**880**	**71**	**69**	**120**	**140**	**64**	**31**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1
pH	T7	AR			**6.7**	**8.5**	**6.6**	**8.3**	**8.0**	**7.0**	**6.5**
Phenols(Mono)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1
Sulphur (total)	T6	AR	0.01	%	**0.17**	**0.05**	**0.12**	<0.01	**0.06**	**0.06**	<0.01

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Soil Analysed as Soil
TPH

				SAL Reference	**261783 009**
				Customer Sample Reference	**WS4 2.0**
				Date Sampled	**12-DEC-2011**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Total Petroleum Hydrocarbons	T8	AR	1	mg/kg	<1

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Soil Analysed as Soil
TPH (CWG)

					SAL Reference	**261783 004**	**261783 008**
					Customer Sample Reference	**TP4 0.3**	**WS4 0.6**
					Date Sampled	**12-DEC-2011**	**12-DEC-2011**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Benzene	T54	AR	1	µg/kg	(13) <1	**(13,2) 4**
Toluene	T54	AR	1	µg/kg	<1	**2**
EthylBenzene	T54	AR	1	µg/kg	<1	(2) <2
M/P Xylene	T54	AR	1	µg/kg	<1	**3**
O Xylene	T54	AR	1	µg/kg	<1	**4**
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1	(2) <2
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	<0.010	(2) <0.020
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	(2) <0.020
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	(2) <0.020
TPH (C10-C12 aliphatic)	T8	AR	1	mg/kg	<1	<1
TPH (C12-C16 aliphatic)	T8	AR	1	mg/kg	<1	<1
TPH (C16-C21 aliphatic)	T8	AR	1	mg/kg	<1	**1**
TPH (C21-C35 aliphatic)	T8	AR	1	mg/kg	**1**	**12**
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	(2) <0.020
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	(2) <0.020
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	**0.025**
TPH (C10-C12 aromatic)	T8	AR	1	mg/kg	<1	<1
TPH (C12-C16 aromatic)	T8	AR	1	mg/kg	<1	<1
TPH (C16-C21 aromatic)	T8	AR	1	mg/kg	<1	<1
TPH (C21-C35 aromatic)	T8	AR	1	mg/kg	<1	**9**

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Soil Analysed as Soil
Total and Speciated USEPA16 PAH

					SAL Reference	**261783 001**	**261783 002**	**261783 003**	**261783 004**	**261783 005**	**261783 008**	**261783 009**
					Customer Sample Reference	**TP1 0.8**	**TP2 0.5**	**TP3 1.0**	**TP4 0.3**	**WS2 0.7**	**WS4 0.6**	**WS4 2.0**
					Date Sampled	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**								
Naphthalene	T149	AR	0.01	mg/kg	**0.18**	**0.04**	**0.03**	**0.01**	**0.05**	**0.18**	-
Acenaphthylene	T149	AR	0.01	mg/kg	**0.05**	<0.01	**0.01**	**0.01**	**0.03**	**0.01**	-
Acenaphthene	T149	AR	0.01	mg/kg	**0.07**	**0.07**	**0.02**	**0.01**	**0.05**	**0.04**	-
Fluorene	T149	AR	0.01	mg/kg	**0.12**	**0.04**	**0.02**	**0.01**	**0.05**	**0.03**	-
Phenanthrene	T149	AR	0.01	mg/kg	**0.87**	**0.28**	**0.14**	**0.06**	**0.66**	**0.33**	-
Anthracene	T149	AR	0.01	mg/kg	**0.21**	**0.08**	**0.03**	**0.05**	**0.13**	**0.07**	-
Fluoranthene	T149	AR	0.01	mg/kg	**1.4**	**0.38**	**0.19**	**0.20**	**1.1**	**0.56**	-
Pyrene	T149	AR	0.01	mg/kg	**1.3**	**0.35**	**0.19**	**0.19**	**0.92**	**0.49**	-
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	**0.40**	**0.10**	**0.08**	**0.09**	**0.32**	**0.21**	-
Chrysene	T149	AR	0.01	mg/kg	**0.41**	**0.11**	**0.11**	**0.11**	**0.38**	**0.23**	-
Benzo(b/k)Fluoranthene	T149	AR	0.01	mg/kg	**0.68**	**0.18**	**0.19**	**0.22**	**0.68**	**0.42**	-
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	**0.44**	**0.11**	**0.12**	**0.11**	**0.40**	**0.25**	-
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	**0.15**	**0.04**	**0.04**	**0.05**	**0.15**	**0.10**	-
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	**0.08**	**0.02**	**0.02**	**0.02**	**0.08**	**0.05**	-
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	**0.13**	**0.04**	**0.04**	**0.05**	**0.13**	**0.09**	-
PAH(total)	T149	AR	0.01	mg/kg	**6.5**	**1.8**	**1.2**	**1.2**	**5.1**	**3.1**	**0.03**

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Soil Analysed as Soil
Miscellaneous

				SAL Reference	**261783 001**	**261783 002**	**261783 003**	**261783 004**	**261783 005**
				Customer Sample Reference	**TP1 0.8**	**TP2 0.5**	**TP3 1.0**	**TP4 0.3**	**WS2 0.7**
				Date Sampled	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1
Total Organic Carbon	T21	AR	0.1	%	-	-	**6.7**	-	-

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Soil Analysed as Soil
Miscellaneous

				SAL Reference	**261783 006**	**261783 007**	**261783 008**	**261783 009**
				Customer Sample Reference	**WS2 1.0**	**WS3 2.0**	**WS4 0.6**	**WS4 2.0**
				Date Sampled	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**	**12-DEC-2011**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Leachate Analysed as Water
WML Basic Suite

				SAL Reference	**261783 002**	**261783 005**
				Customer Sample Reference	**TP2 0.5**	**WS2 0.7**
				Date Sampled	**12-DEC-2011**	**12-DEC-2011**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
As (Dissolved)	T281	10:1	10	µg/l	**25**	<10
Boron	T6	10:1	10	µg/l	**13**	**11**
Cd (Dissolved)	T281	10:1	0.02	µg/l	**0.04**	**0.09**
Chromium VI	T4	10:1	30	µg/l	<30	<30
Cu (Dissolved)	T281	10:1	0.5	µg/l	**1.4**	**14**
Pb (Dissolved)	T281	10:1	0.3	µg/l	**0.4**	**4.1**
Hg (Dissolved)	T281	10:1	0.05	µg/l	<0.05	<0.05
Ni (Dissolved)	T373	10:1	10	µg/l	<10	<10
Se (Dissolved)	T281	10:1	10	µg/l	<10	<10
V (Dissolved)	T281	10:1	2	µg/l	**30**	**4**
Zn (Dissolved)	T373	10:1	10	µg/l	<10	<10
Cyanide(Total)	T4	10:1	0.05	mg/l	<0.05	<0.05
pH	T7	10:1			**9.5**	**9.0**
Phenols(Mono)	T4	10:1	0.1	mg/l	<0.1	<0.1
Sulphate ion	T11	10:1	0.05	mg/l	**11**	**9.6**
Sulphur (total)	T6	10:1	50	mg/l	<50	<50

SAL Reference: 261783
Project Site: Tenax road, Trafford Park
Customer Reference: 5044G

Leachate Analysed as Water
Total and Speciated USEPA16 PAH

SAL Reference	**261783 002**	**261783 005**
Customer Sample Reference	**TP2 0.5**	**WS2 0.7**
Date Sampled	**12-DEC-2011**	**12-DEC-2011**

Determinand	Method	Test Sample	LOD	Units		
Naphthalene	T149	10:1	0.01	µg/l	**2.0**	**4.2**
Acenaphthylene	T149	10:1	0.01	µg/l	<0.01	**0.07**
Acenaphthene	T149	10:1	0.01	µg/l	**0.70**	**1.9**
Fluorene	T149	10:1	0.01	µg/l	**0.20**	**0.63**
Phenanthrene	T149	10:1	0.01	µg/l	**0.11**	**0.39**
Anthracene	T149	10:1	0.01	µg/l	<0.01	**0.11**
Fluoranthene	T149	10:1	0.01	µg/l	<0.01	**0.08**
Pyrene	T149	10:1	0.01	µg/l	<0.01	**0.07**
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	<0.01	**0.04**
Chrysene	T149	10:1	0.01	µg/l	<0.01	**0.04**
Benzo(b/k)Fluoranthene	T149	10:1	0.01	µg/l	**0.08**	**0.13**
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	**0.05**	**0.06**
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	<0.01	<0.01
PAH(total)	T149	10:1	0.01	µg/l	**3.1**	**7.7**

Index to symbols used in 261783-1

Value	Description
AR	As Received
10:1	Leachate
13	Results have been blank corrected.
2	LOD Raised Due to Matrix Interference
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T21	OX/IR
T6	ICP/OES
T54	GC/MS (Headspace)
T281	ICP/MS (Filtered)
T373	ICP/OES (Filtered)
T11	IC
T7	Probe
T8	GC/FID
T149	GC/MS (SIR)
T4	Colorimetry

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
SO4(2:1)	T6	AR	0.1	g/l	N	001-009
Total Organic Carbon	T21	AR	0.1	%	N	003
Naphthalene	T149	AR	0.01	mg/kg	U	001-005,008
Acenaphthylene	T149	AR	0.01	mg/kg	U	001-005,008
Acenaphthene	T149	AR	0.01	mg/kg	U	001-005,008
Fluorene	T149	AR	0.01	mg/kg	U	001-005,008
Phenanthrene	T149	AR	0.01	mg/kg	U	001-005,008
Anthracene	T149	AR	0.01	mg/kg	U	001-005,008
Fluoranthene	T149	AR	0.01	mg/kg	U	001-005,008
Pyrene	T149	AR	0.01	mg/kg	U	001-005,008
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	U	001-005,008
Chrysene	T149	AR	0.01	mg/kg	U	001-005,008

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Benzo(b/k)Fluoranthene	T149	AR	0.01	mg/kg	U	001-005,008
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	U	001-005,008
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	U	001-005,008
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	U	001-005,008
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	U	001-005,008
PAH(total)	T149	AR	0.01	mg/kg	U	001-005,008-009
Naphthalene	T149	10:1	0.01	µg/l	U	002,005
Acenaphthylene	T149	10:1	0.01	µg/l	U	002,005
Acenaphthene	T149	10:1	0.01	µg/l	U	002,005
Fluorene	T149	10:1	0.01	µg/l	U	002,005
Phenanthrene	T149	10:1	0.01	µg/l	U	002,005
Anthracene	T149	10:1	0.01	µg/l	U	002,005
Fluoranthene	T149	10:1	0.01	µg/l	U	002,005
Pyrene	T149	10:1	0.01	µg/l	U	002,005
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	U	002,005
Chrysene	T149	10:1	0.01	µg/l	U	002,005
Benzo(b/k)Fluoranthene	T149	10:1	0.01	µg/l	U	002,005
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	U	002,005
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	U	002,005
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	U	002,005
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	U	002,005
PAH(total)	T149	10:1	0.01	µg/l	U	002,005
Benzene	T54	AR	1	µg/kg	U	004,008
Toluene	T54	AR	1	µg/kg	U	004,008
EthylBenzene	T54	AR	1	µg/kg	U	004,008
M/P Xylene	T54	AR	1	µg/kg	U	004,008
O Xylene	T54	AR	1	µg/kg	U	004,008
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	U	004,008
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	N	004,008
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	N	004,008
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	N	004,008
TPH (C10-C12 aliphatic)	T8	AR	1	mg/kg	N	004,008
TPH (C12-C16 aliphatic)	T8	AR	1	mg/kg	N	004,008
TPH (C16-C21 aliphatic)	T8	AR	1	mg/kg	N	004,008
TPH (C21-C35 aliphatic)	T8	AR	1	mg/kg	N	004,008
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	N	004,008
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	N	004,008
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	N	004,008
TPH (C10-C12 aromatic)	T8	AR	1	mg/kg	N	004,008
TPH (C12-C16 aromatic)	T8	AR	1	mg/kg	N	004,008
TPH (C16-C21 aromatic)	T8	AR	1	mg/kg	N	004,008
TPH (C21-C35 aromatic)	T8	AR	1	mg/kg	N	004,008
As (Dissolved)	T281	10:1	10	µg/l	U	002,005
Boron	T6	10:1	10	µg/l	N	002,005
Cd (Dissolved)	T281	10:1	0.02	µg/l	U	002,005
Chromium VI	T4	10:1	30	µg/l	N	002,005
Cu (Dissolved)	T281	10:1	0.5	µg/l	U	002,005
Pb (Dissolved)	T281	10:1	0.3	µg/l	U	002,005
Hg (Dissolved)	T281	10:1	0.05	µg/l	U	002,005
Ni (Dissolved)	T373	10:1	10	µg/l	U	002,005
Se (Dissolved)	T281	10:1	10	µg/l	U	002,005
V (Dissolved)	T281	10:1	2	µg/l	U	002,005
Zn (Dissolved)	T373	10:1	10	µg/l	U	002,005
Cyanide(Total)	T4	10:1	0.05	mg/l	U	002,005
pH	T7	10:1			U	002,005
Phenols(Mono)	T4	10:1	0.1	mg/l	N	002,005
Sulphate ion	T11	10:1	0.05	mg/l	N	002,005
Sulphur (total)	T6	10:1	50	mg/l	N	002,005
Arsenic	T6	AR	1	mg/kg	U	001-005,008-009
Boron (water-soluble)	T6	AR	1	mg/kg	N	001-005,008-009
Cadmium	T6	AR	1	mg/kg	U	001-005,008-009
Chromium VI	T6	AR	1	mg/kg	N	001-005,008-009
Copper	T6	AR	1	mg/kg	U	001-005,008-009
Lead	T6	AR	1	mg/kg	U	001-005,008-009
Mercury	T6	AR	1	mg/kg	U	001-005,008-009
Nickel	T6	AR	1	mg/kg	U	001-005,008-009
Selenium	T6	AR	3	mg/kg	U	001-005,008-009
Vanadium	T6	AR	1	mg/kg	U	001-005,008-009
Zinc	T6	AR	1	mg/kg	U	001-005,008-009
Cyanide(Total)	T4	AR	1	mg/kg	U	001-005,008-009

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
pH	T7	AR			U	001-005,008-009
Phenols(Mono)	T4	AR	1	mg/kg	U	001-005,008-009
Sulphur (total)	T6	AR	0.01	%	N	001-005,008-009
Total Petroleum Hydrocarbons	T8	AR	1	mg/kg	U	009

APPENDIX 05

Ground Gas Monitoring Results

Ground Gas Monitoring Record

Borehole	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (% v/v)		Methane (%LEL*)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Nitrogen (%v/v)		Depth to water (m bgl)	Atmospheric Pressure (mB)	Comments
			Initial	Steady	Initial	Steady	Initial	Steady	Initial	Steady	Initial	Steady			
WS1															Area Flooded
WS2	0.0	0		0.0				3.1		15.1		81.7	1.89	985	
WS3	0.0	0		0.0				0.0		20.7		79.1	2.07	985	

Notes:

Monitoring should be for not less than 3 Minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 mins.
* LEL = Explosive Limit = 5%v/v
ND - Not Detected

Relevant Information at times of monitoring

Monitored by:	J. Crook	Contract: **Tenax Road**
Weather :	Overcast	
Equipment used:	LMS Type G3 xi Gas Meter	Date: **13.12.2012**
Visible signs of vegetation stress:		
Boreholes sampled for laboratory analysis:		Job No.
Other comments / observations:		Sheet No. **1**

Geo-Ventures (UK) Limited
70 Riverside Close, Waterside, Howley, Warrington, Cheshire WA1 2JD
Tel. 01925 240476 email: paul.platt@geoventures.co.uk

Ground Gas Monitoring Record

Borehole	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (% v/v)		Methane (%LEL*)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Nitrogen (%v/v)		Depth to water (m bgl)	Atmospheric Pressure (mB)	Comments
			Initial	Steady	Initial	Steady	Initial	Steady	Initial	Steady	Initial	Steady			
WS1															Buried under pile of sand
WS2	0.0	0		0.0				2.3		16.4		81.2	1.79	991	
WS3	0.0	0		0.0				0.1		20.0		79.8	1.58	991	

Notes:

Monitoring should be for not less than 3 Minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 mins.
* LEL = Explosive Limit = 5%v/v
ND - Not Detected

Relevant Information at times of monitoring

Monitored by:	J. Crook	Contract: **Tenax Road**
Weather :	Overcast	
Equipment used:	LMS Type G3 xi Gas Meter	Date: **03.01.2012**
Visible signs of vegetation stress:		
Boreholes sampled for laboratory analysis:		Job No.
Other comments / observations:		Sheet No. **2**

Geo-Ventures (UK) Limited
70 Riverside Close, Waterside, Howley, Warrington, Cheshire WA1 2JD
Tel. 01925 240476 email: paul.platt@geoventures.co.uk

APPENDIX 06

Extracts from CC Geotechnical Report 2009

CC Geotechnical	Tel: 0151-523-0202 Fax: 0151-523-0252	BOREHOLE LOG	HOLE NO. BH4 Sheet 1 of 2

CLIENT	SITE
AXION/S.NORTON	S.NORTON, TENAX ROAD, TRAFFORD PARK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
19/05/09-20/05/09	1:50	SEE LOCATION PLAN	LW	PMC	09/5512

SAMPLE RECORD DEPTH	TYPE	SPT N (Cu-kN/m²)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	REDUCED LEVEL	LEGEND
0.25	SD			BITUMEN MACADAM (0.15)			
0.25	PID	0.0PPM		Loose (drillers description) MADE GROUND comprising of broken and fragmented brick with gravel of coal ash within a brown/black silty clayey sand matrix (1.15)	0.15		
0.50	SD						
0.50	PID	0.0PPM					
0.50	BULK						
0.75	SD						
0.75	PID	0.0PPM					
1.20 - 1.65	SPT	9		Medium dense brown fine and medium silty gravelly SAND (1.90)	1.30		
1.65	BULK						
2.00 - 2.45	SPT	14					
3.50	BULK			Medium dense brown fine to coarse very gravelly SAND (1.10)	3.20		
4.00 - 4.45	SPT	15					
4.50	BULK			Firm becoming firm to stiff brown silty sandy gravelly CLAY (6.20)	4.30		
5.00 - 5.45	SPT	12					
6.00	BULK						
6.50 - 6.95	U100	(69)					
7.50	BULK						
8.00 - 8.45	SPT	16					
9.00	BULK						
9.50 - 9.95	U100	(63)					

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
2.70	2.70				SEEPAGE
	10.00		DRY		BH DRY AT E.O.S. 19/05/09
	10.00		DRY		BH DRY AT E.O.S. 20/05/09

BORING METHOD AND REMARKS

DANDO 150

HAND DUG SERVICE PIT TO 1.2MBGL

All dimensions are in metres unless otherwise stated

CC Geotechnical
Tel: 0151-523-0202
Fax: 0151-523-0252

BOREHOLE LOG

HOLE NO. BH4
Sheet 2 of 2

CLIENT	SITE
AXION/S.NORTON	S.NORTON, TENAX ROAD, TRAFFORD PARK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
19/05/09-20/05/09	1:50	SEE LOCATION PLAN	LW	PMC	09/5512

SAMPLE RECORD DEPTH	SAMPLE RECORD TYPE	SPT N (Cu kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	REDUCED LEVEL	LEGEND
				CONTINUED BORING IN SAME STRATUM			
10.50	BULK			Stiff brown silty sandy gravelly CLAY with frequent sand lenses	10.50		
11.00-11.45	SPT	18					
				BOREHOLE TERMINATED	12.00		

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
2.70	2.70				SEEPAGE
	10.00		DRY		BH DRY AT E.O.S. 19/05/09
	10.00		DRY		BH DRY AT S.O.S. 20/05/09

BORING METHOD AND REMARKS

DANDO 150
HAND DUG SERVICE PIT TO 1.2MBGL

All dimensions are in metres unless otherwise stated

T5

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with BS1377:Part 2:1990 & B.R.E. IP 4/93 (soil suction values)

BH / TP / WS Number	Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Shear Strength (kN/m^2)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425micron (%)	Soil Classification	Description / Remarks Samples described in accordance with BS 5930:1999 Clause 6
BH1	BD	2.50	2.50	26	-	-	-	-	-	-	-	-	Brown silty slightly gravelly SAND. (see PSD result sheet)
BH1	BD	4.50	4.50	18	-	-	-	29	13	16	87	CL	Brown silty slightly sandy slightly gravelly CLAY
BH1	U100	6.50	6.95	15	-	-	60*	-	-	-	-	-	Firm brown silty slightly sandy slightly gravelly CLAY with occasional coal gravels
BH1	U100	8.00	8.45	15	2.20	1.91	115	-	-	-	-	-	Stiff brown silty slightly sandy slightly gravelly CLAY with occasional coal gravel. (see triaxial result sheet)
BH2	BD	1.50	1.50	26	-	-	-	-	-	-	-	-	Brown silty slightly gravelly SAND. (see PSD result sheet)
BH2	BD	3.50	3.50	20	-	-	-	-	-	-	-	-	Brown silty gravelly SAND. (see PSD result sheet)
BH2	BD	4.50	4.50	22	-	-	-	34	13	21	90	CL	Brown silty slightly sandy slightly gravelly CLAY
BH2	U100	5.20	5.65	16	2.28	1.97	41	-	-	-	-	-	Firm brown silty slightly sandy slightly gravelly CLAY. (see triaxial result sheet)
BH2	U100	8.00	8.45	15	2.22	1.93	98	-	-	-	-	-	Stiff brown silty slightly sandy slightly gravelly CLAY. (see triaxi result sheet)
BH3	BD	3.50	3.50	17	-	-	-	-	-	-	-	-	Brown very gravelly silty SAND. (see PSD result sheet)
BH3	BD	4.50	4.50	21	-	-	-	35	14	21	90	CL / CI	Brown silty slightly sandy slightly gravelly CLAY
BH3	U100	5.00	5.45	15	2.26	1.96	42	-	-	-	-	-	Firm brown silty slightly sandy slightly gravelly CLAY. (see triaxial result sheet)
BH3	U100	8.00	8.45	18	2.21	1.87	139	-	-	-	-	-	Stiff brown silty slightly sandy slightly gravelly CLAY. (see triaxi result sheet)
BH3	U100	11.00	11.45	14	-	-	120*	-	-	-	-	-	Stiff brown silty slightly sandy slightly gravelly CLAY
BH4	BD	1.65	1.65	26	-	-	-	-	-	-	-	-	Brown very silty gravelly SAND. (see PSD result sheet)

SITE: TENAX ROAD, S. NORTON (09/5512)
CLIENT: AXION

DATE: Jun-09
SHEET: 1 of 2

CC Geotechnical
Telephone: (0151) 523 0202

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)

T5

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with BS1377:Part 2:1990 & B.R.E. IP 4/93 (soil suction values)

BH / TP / WS Number	Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m³)	Dry Density (Mg/m³)	Shear Strength (kN/m²)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425micron (%)	Soil Classification	Description / Remarks Samples described in accordance with BS 5930:1999 Clause 6
BH4	BD	3.50	3.50	9.7	-	-	-	-	-	-	-	-	Brown very sandy slightly silty GRAVEL. (see PSD result sheet)
BH4	BD	4.50	4.50	28	-	-	-	50	19	31	99	CI / CH	Brown silty slightly sandy slightly gravelly CLAY
BH4	U100	6.50	6.95	15	2.30	2.00	69	-	-	-	-	-	Firm brown silty slightly sandy slightly gravelly CLAY. (see triaxial result sheet)
BH4	U100	9.50	9.95	14	2.22	1.95	63	-	-	-	-	-	Firm brown silty slightly sandy slightly gravelly CLAY. (see triaxial result sheet)

SITE: TENAX ROAD, S. NORTON (09/5512)

CLIENT: AXION

DATE: Jun-09

SHEET: 2 of 2

CC Geotechnical

Telephone: (0151) 523 0202

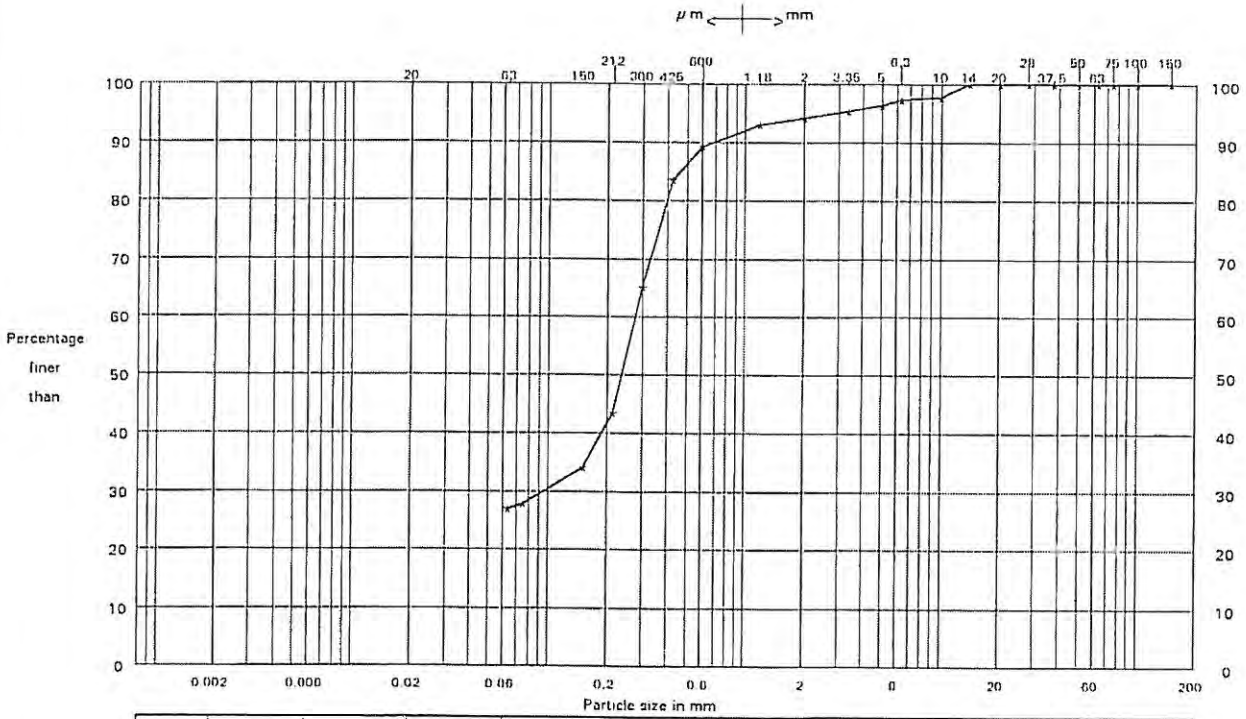
Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm

CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic

(* Denotes Hand Shear Vane test result)

CC Geotechnical	Tel: 0151-523-0202 Fax: 0151-523-0252	DETERMINATION OF PARTICLE SIZE DISTRIBUTION	HOLE NO. BH4
CLIENT AXION		SITE TENAX ROAD, S. NORTON	
SAMPLE DEPTH 1.65 - 1.65		SAMPLE REF 4	JOB NO. 09/5513
METHOD OF PRETREATMENT		METHOD OF TEST Wet Sieve	

	Size (microns)							Size (mm)													
Sieve Size	63	75	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	100	150
% by Mass passing Sieve	27	28	34	43	65	83	89	93	94	95	96	97	98	100	100	100	100	100	100	100	100	100



	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
		SILT			SAND			GRAVEL			
%	-	-			67			6			0

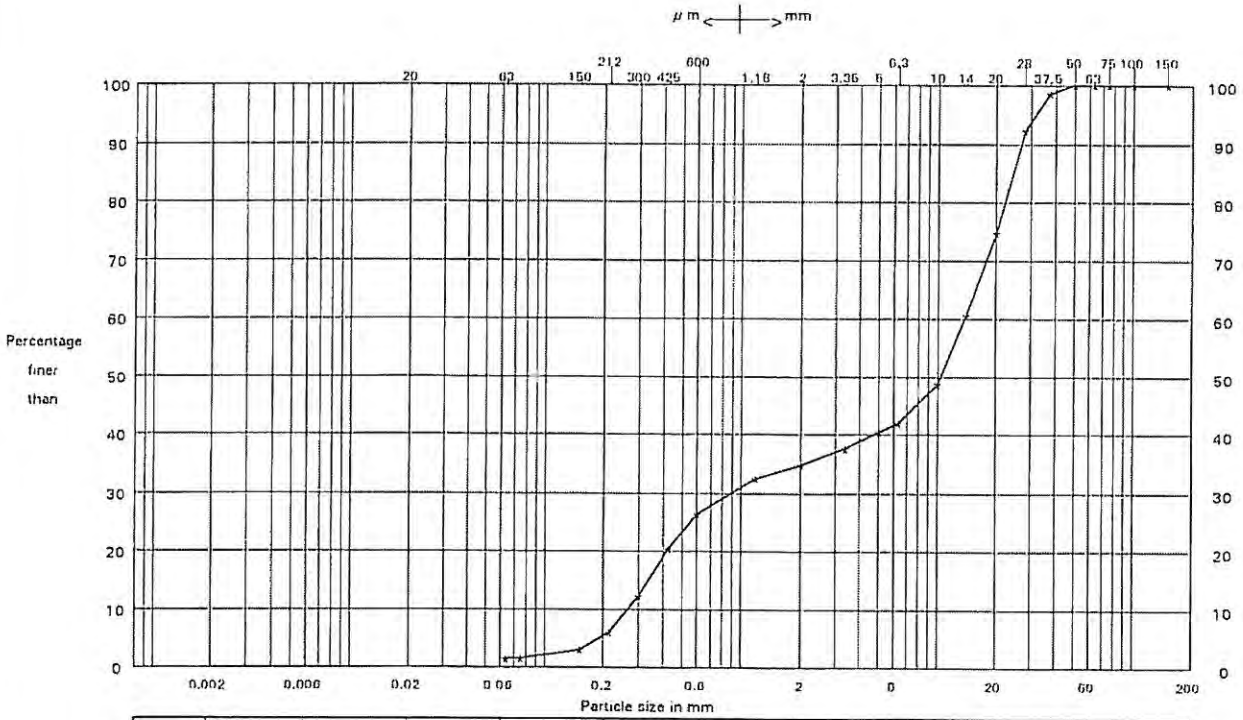
SAMPLE DESCRIPTION

Brown very silty gravelly SAND

REMARKS

CC Geotechnical	Tel: 0151-523-0202 Fax: 0151-523-0252	DETERMINATION OF PARTICLE SIZE DISTRIBUTION	HOLE NO. BH4
CLIENT AXION		SITE TENAX ROAD, S. NORTON	
SAMPLE DEPTH 3.50 - 3.50		SAMPLE REF 6	JOB NO. 09/5512
METHOD OF PRETREATMENT		METHOD OF TEST Wet Sieve	

	Size (microns)							Size (mm)														
Sieve Size	63	75	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	100	150
% by Mass passing Sieve	1	1	3	6	12	20	26	32	35	38	40	42	49	60	75	92	99	100	100	100	100	100



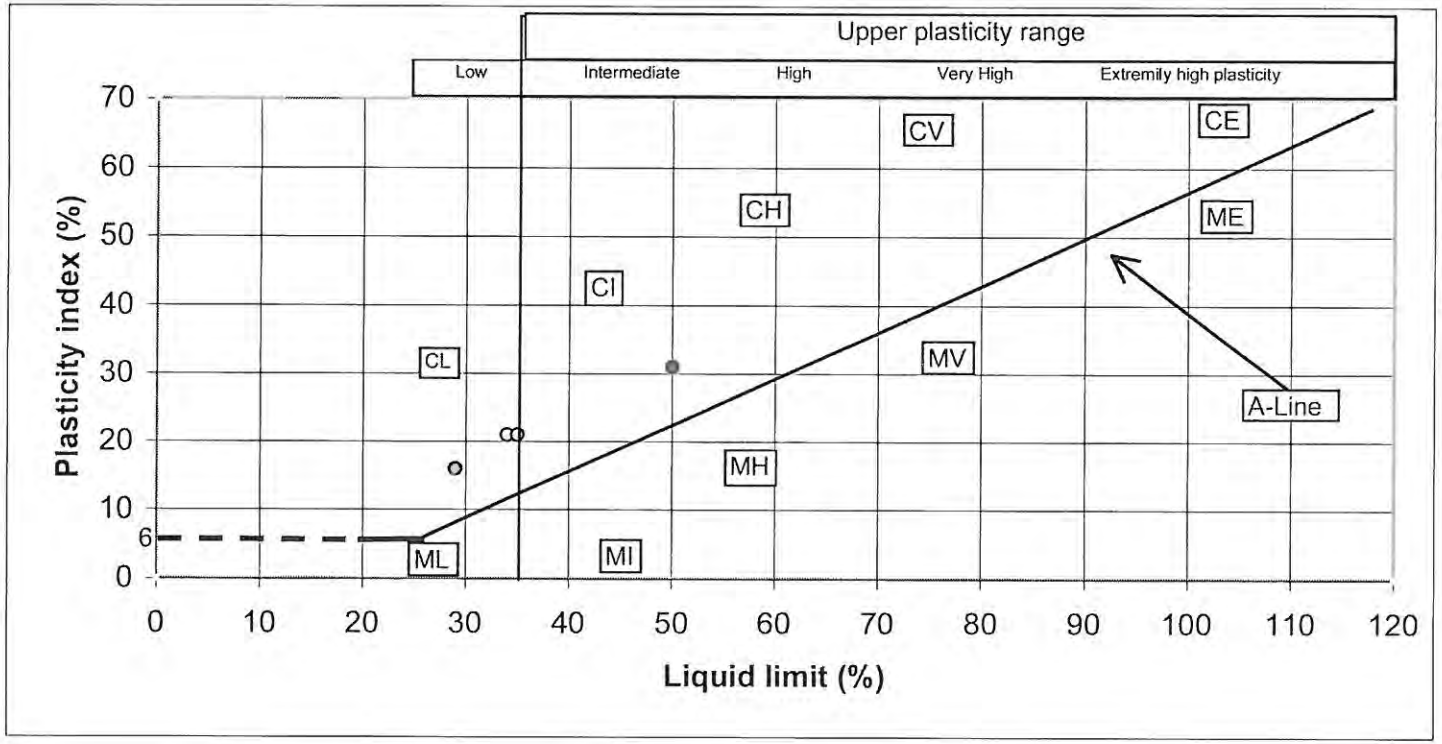
	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
		SILT			SAND			GRAVEL			
%	-	-			34			65			0

SAMPLE DESCRIPTION	REMARKS
Brown very sandy slightly silty GRAVEL	

CC Geotechnical

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990

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



BH	Sample Depth	Liquid limit	Plasticity index
BH1	4.50	29.0	16.0
BH2	4.50	34.0	21.0
BH3	4.50	35.0	21.0
BH4	4.50	50.0	31.0

CLIENT: AXION	SITE: TENAX ROAD, S. NORTON (09/5512)

THE ENVIRONMENTAL LABORATORY LTD

The Harley Reed Building, Unit C, Drury Lane, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BA
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR21167

Location: Tenax Road

2683 2683

Your Project No: 09/5512

Reporting Date: 09/06/09

F.A.O. Paul McFadden
CC Geotechnical Limited
Essex House, Bridle Road
Bootle, Liverpool
Merseyside, L30 4UE

Soils

Characteristic	Date Sampled	TP/BH	Depth (m)	Our ref	Arsenic** (mg/kg)	Barium* (mg/kg)	Beryllium* (mg/kg)	Cadmium** (mg/kg)	Chromium** (mg/kg)	Lead** (mg/kg)	Mercury** (mg/kg)	Nickel** (mg/kg)	Copper** (mg/kg)	Zinc** (mg/kg)	Selenium (mg/kg)	Vanadium** (mg/kg)	Water Soluble Boron (mg/kg)
Sandy silt loam	12/05/09	BH1	0.30	20745	11.5	3641	<1	4.8	17	88	<0.5	25	1548	118	<0.5	27	0.9
Sandy silt loam	13/05/09	BH2	0.40	21019	36.1	107	<1	1.5	32	224	<0.5	62	261	142	0.9	22	3.0
Sandy silt loam	18/05/09	BH3	0.60	21207	15.4	158	<1	0.7	143	994	1.0	21	43	230	0.5	94	0.9
Sandy Silt Loam	19/05/09	BH4	0.50	21277	14.1	553	<1	1.1	18	276	<0.5	22	548	222	1.0	28	2.2

All results expressed on dry weight basis
** - MCERTS accredited test
* = UKAS accredited test
MP

THE ENVIRONMENTAL LABORATORY LTD

The Harley Reed Building, Unit C, Drury Lane, Ponswood Industrial Estate, St Leonard's on Sea, East Sussex, TN38 9BA
Tel: 01424 718618 Fax: 01424 729911

ANALYTICAL REPORT No. AR21167

Location: Tenax Road

2683 2683

Your Project No: 09/5512

Reporting Date: 09/06/09

F.A.O. Paul McFadden
CC Geotechnical Limited
Essex House, Bridle Road
Bootle, Liverpool
Merseyside, L30 4UE

Soils

Characteristic	Date Sampled	TP/BH	Depth (m)	Our ref	pH Value**	Total Sulphate	Water Soluble Sulphate**	Total Cyanide**	Free Cyanide	Complex Cyanide	Sulphide	Elemental Sulphur**	Water Soluble Nitrate	Soil Organic Matter*
					(Units)	(mg/kg)	(mg/l as SO4)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(%)
Sandy silt loam	12/05/09	BH1	0.30	20745	8.9	1596	119	<1	<1	<1	<2	<10	<5	0.4
Sandy silt loam	13/05/09	BH2	0.40	21019	6.0	3860	100	<1	<1	<1	<2	<10	8	3.4
Sandy silt loam	18/05/09	BH3	0.60	21207	9.8	6912	1525	<1	<1	<1	3.0	<10	34	0.5
Sandy Silt Loam	19/05/09	BH4	0.50	21277	6.8	1309	110	<1	<1	<1	31.3	83	9	2.3

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Soils

Characteristic	Date Sampled	TP/BH	Depth (m)	Our ref	Naphthalene** (mg/kg)	Acenaphthylene** (mg/kg)	Acenaphthene** (mg/kg)	Fluorene** (mg/kg)	Phenanthrene** (mg/kg)	Anthracene** (mg/kg)	Fluoranthene** (mg/kg)	Pyrene** (mg/kg)	Benz(a)anthracene** (mg/kg)	Chrysene** (mg/kg)	Benzo(b)fluoranthene** (mg/kg)	Benzo(k)fluoranthene** (mg/kg)	Benzo(a)pyrene** (mg/kg)	Indeno(123-cd)pyrene** (mg/kg)	Dibenz(ah)anthracene** (mg/kg)	Benzo(ghi)perylene** (mg/kg)	Total PAH** (mg/kg)
Sandy silt loam	12/05/09	BH1	0.30	20745	0.6	<0.1	1.0	0.7	6.9	1.7	6.2	4.3	2.6	3.1	2.0	1.9	1.8	1.2	0.3	1.3	35.5
Sandy silt loam	13/05/09	BH2	0.40	21019	0.3	0.2	0.3	<0.1	2.4	1.3	2.7	2.6	1.5	1.8	2.1	1.4	1.4	0.8	0.8	1.7	21.3
Sandy silt loam	18/05/09	BH3	0.60	21207	1.7	0.1	2.3	1.6	17.9	3.7	18.6	16.5	8.5	10.8	7.0	6.3	7.5	4.5	1.3	5.7	114.0
Sandy Silt Loam	19/05/09	BH4	0.50	21277	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.6	0.5	<0.1	<0.1	0.4	0.3	0.2	0.4	0.1	0.7	3.4

All results expressed on dry weight basis
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Merseyside, L30 4UE

TPH CWG - Soil

Characteristic	Date Sampled	TP/BH	Depth (m)	Our ref	Aromatic							Aliphatic						TPH (C_6 - C_{40}) (mg/kg)
					>EC_5-EC_7 (mg/kg)	>EC_7-EC_8 (mg/kg)	>EC_8-EC_{10} (mg/kg)	>EC_{10}-EC_{12} (mg/kg)	>EC_{12}-EC_{16} (mg/kg)	>EC_{16}-EC_{21} (mg/kg)	>EC_{21}-EC_{35} (mg/kg)	>EC_5-EC_6 (mg/kg)	>EC_6-EC_8 (mg/kg)	>EC_8-EC_{10} (mg/kg)	>EC_{10}-EC_{12} (mg/kg)	>EC_{12}-EC_{16} (mg/kg)	>EC_{16}-EC_{35} (mg/kg)	
Sandy silt loam	12/05/09	BH1	0.30	20745	<0.01	<0.01	<0.1	<1	<1	<1	4	<0.01	<0.01	<0.1	<1	<1	9	13
Sandy silt loam	13/05/09	BH2	0.40	21019	<0.01	<0.01	0.1	<1	<1	<1	9	<0.01	<0.01	<0.1	<1	<1	12	21
Sandy silt loam	18/05/09	BH3	0.60	21207	<0.01	<0.01	<0.1	<1	<1	11	70	<0.01	<0.01	<0.1	<1	<1	179	260
Sandy Silt Loam	19/05/09	BH4	0.50	21277	<0.01	<0.01	<0.1	<1	<1	<1	9	<0.01	<0.01	<0.1	<1	<1	6	15

All results expressed on dry weight basis

MP

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Reporting Date: 09/06/09

Asbestos Identification

Sample ref:	**BH1**
Depth (m)	**0.30**
Our ref:	**20745**
#Description of Sample Matrix:	Sandy silt loam
Result	No asbestos identified

Sample ref:	**BH2**
Depth (m)	**0.40**
Our ref:	**21019**
#Description of Sample Matrix:	Sandy silt loam
Result	No asbestos identified

Sample ref:	**BH3**
Depth (m)	**0.60**
Our ref:	**21207**
#Description of Sample Matrix:	Sandy silt loam
Result	No asbestos identified

Sample ref:	**BH4**
Depth (m)	**0.50**
Our ref:	**21277**
#Description of Sample Matrix:	Sandy Silt Loam
Result	No asbestos identified

*= UKAS accredited
Analytical result only applies to the sample as submitted by the client
Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client

MONITORING RESULTS

Job Number:	09/5512		Site Name:	S.NORTON & CO LTD, TENAX ROAD

BH	VISIT NUMBER	1	2	3	4	5	
	DATE	27/05/09	02/06/09	12/06/09	19/06/09	03/07/09	
	ATMOSPHERIC PRESSURE (mB) / TREND	1016 / FALLING	1027 / RISING	1016 / FALLING	1017 / RISING	1006 / FALLING	
	AIR TEMPERATURE (^{O}C)	10	21	9	11	20	
	CLOUD COVER	OVERCAST	CLEAR	CLEAR	OVERCAST	OVERCAST	
	WIND	LIGHT	LIGHT	LIGHT	MODERATE	MODERATE	
	PRECIPITATION	MODERATE	DRY	DRY	DRY	WET	
	STATE OF GROUND	WET	DRY	DRY	DRY	WET	
BH1	CH_4 (%)	NIL	NIL	NIL	NIL	NIL	
	CO_2 (%)	4.8	4.6	4.5	4.1	4.7	
	O_2 (%)	12.2	13.1	15.8	16.1	15.1	
	H_2S (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	CO (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	PID READING (ppm)	0.0	0.0	0.0	0.0	0.0	
	FLOW (l/hr)	<0.1	<0.1	<0.1	<0.1	<0.1	
	STANDING WATER LEVEL (m)	2.68	2.63	2.66	2.67	2.74	
BH2	CH_4 (%)	NIL	NIL	NIL	NIL	NIL	
	CO_2 (%)	NIL	NIL	0.7	0.6	0.7	
	O_2 (%)	20.8	20.9	19.9	19.8	19.0	
	H_2S (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	CO (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	PID READING (ppm)	0.0	0.0	0.0	0.0	0.0	
	FLOW (l/hr)	<0.1	<0.1	<0.1	<0.1	<0.1	
	STANDING WATER LEVEL (m)	2.64	2.61	2.61	2.60	2.64	
BH3	CH_4 (%)	NIL	NIL	NIL	NIL	NIL	
	CO_2 (%)	NIL	NIL	NIL	NIL	NIL	
	O_2 (%)	21.0	21.1	20.6	20.5	20.4	
	H_2S (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	CO (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	PID READING (ppm)	0.0	0.0	0.0	0.0	0.0	
	FLOW (l/hr)	<0.1	<0.1	<0.1	<0.1	<0.1	
	STANDING WATER LEVEL (m)	2.44	2.42	2.42	2.40	2.44	
BH4	CH_4 (%)	NIL	NIL	NIL	NIL	NIL	
	CO_2 (%)	0.4	0.3	0.4	0.4	0.5	
	O_2 (%)	20.1	20.2	19.8	19.7	19.2	
	H_2S (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	CO (p.p.m.)	NIL	NIL	NIL	NIL	NIL	
	PID READING (ppm)	0.0	0.0	0.0	0.0	0.0	
	FLOW (l/hr)	<0.1	<0.1	<0.1	<0.1	<0.1	
	STANDING WATER LEVEL (m)	2.52	2.51	2.52	2.53	2.59	

INSTRUMENTS USED: GA2000 AND FLOW POD / MINIRAE 2000

APPENDIX 07

Generic Assessment Criteria

S NORTON & CO
GENERIC ASSESSMENT CRITERIA (GAC)

Contaminant	GAC for Commercial End Use (mg/kg) 1% Soil Organic Matter (SOM)
Arsenic SGV	640
Boron	192,000
Cadmium SGV	230
Chromium VI	35
Copper	71,700
Lead	4400
Mercury SGV	3600
Nickel SGV	1800
Selenium SGV	13,000
Vanadium	3160
Zinc	665,000
Cyanide	16,000
Benz[a]anthracene	90
Benzo[a]pyrene	14
Benzo[b]fluoranthene	100
Benzo[ghi]perylene	650
Benzo[k]fluoranthene	140
Chrysene	140
Dibenz[ah]anthracene	13
Fluoranthene	23,000
Indeno[123-cd]pyrene	60
Naphthalene	76
Phenol SGV	24,000
Pyrene	54,000
Benzene	16
EthylBenzene	510
Toluene	59,000
Xylene	470
TPH (C21-C35 aliphatic)	1,600,000
TPH (C21-C35 aromatic)	28,000