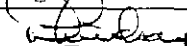
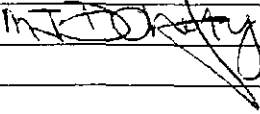


**GLADEDALE (SOUTH YORKSHIRE) LTD.  
& THE BANK OF SCOTLAND**

**NORTH GAWBER COLLIERY SITE  
MAPPLEWELL, BARNSELEY**

**GROUND INVESTIGATION REPORT**

March 2008

|                   | Name             | Signature                                                                            | Date       |
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**GROUND INVESTIGATION REPORT**

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## **1. INTRODUCTION**

### **1.1. Preamble**

Scott Doherty Associates Ltd. (SDA) was appointed by Gladedale (South Yorkshire) Ltd. (GSY), formerly Ben Bailey Homes Ltd., to carry out a ground investigation for a proposed residential development at the former North Gawber Colliery site at Mapplewell near Barnsley in South Yorkshire.

The site comprises 15.5 hectares (ha) of land consisting of colliery spoil, derelict land, birch plantation and marshland. The site is presently used as informal public open space (POS).

A regional location plan is included as **Figure 1**.

### **1.2. Previous Work**

A desk study for a proposed opencast mine at North Gawber was carried out by the former British Coal Opencast Executive (BCOE) in December 1990 (Ref. 1).

BCOE also carried out extensive exploratory drilling to investigate the shallow coal reserves beneath the site. Copies of the borehole logs were made available to SDA and information from them has been used in the preparation of this report.

A geo-environmental assessment of the site was carried out by SDA for UK Coal Mining Ltd. (UKCM) in 2005. A detailed report was submitted to UKCM in April 2005 (Ref. 2).

Although the main findings of these studies are summarised in this report, it is recommended that the original reports are read in conjunction with this document.

### **1.3. Purpose and Scope of Report**

The principal aims of the ground investigation are summarised as follows:

- To provide further information on the ground conditions and chemical contamination at the site, with particular emphasis on the area of the former colliery and coke ovens in the north-east of the site.
- To prove the depth of remnant foundations and sub-structures in the areas of derelict land and the thickness of made ground across the entire area but especially in the former lagoons in the south of the site.
- To investigate old mineworkings in the Kent's Thick seam and determine the extent of any remedial drilling and grouting works required to stabilise the workings.
- To provide information on the geotechnical properties of the superficial deposits for foundation design and establish the nature of the groundwater conditions at the site.



#### 1.4. **Format of Report**

The information contained in this report comprises a factual and interpretive section.

The factual section includes a summary of the findings of the previous studies, a detailed account of the ground investigation fieldwork and laboratory analysis and a description of the ground conditions encountered in the exploratory holes.

The interpretive section provides advice and recommendations with respect to the future re-development of the site for housing and deals specifically with issues relating to contaminated land and foundation design.

The section dealing with contamination is mainly based on the results of chemical analyses carried out as part of this investigation although the results from the previous investigation were also taken into account.

This report was prepared in accordance with the advice contained in the Environment Agency (EA) Research and Development Publication No. 66 (Ref. 3).

#### 1.5. **Use of Information**

The information contained in this report is intended for the use of GSY and their mortgagors. The report is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party without the prior written consent of SDA.

## **2. SOURCES OF INFORMATION**

### **2.1. Preamble**

The desk study involved a review of published information relating to the site to determine its historical, geological and environmental setting.

The principal sources of information consulted in the preparation of this report are described below.

### **2.2. Site Inspection**

A detailed site inspection was undertaken in September 2007 prior to commencing any intrusive works. The findings of the inspection were used to plan the ground investigation described later in this report.

### **2.3. Published Geology**

Maps produced by the British Geological Survey (BGS) were inspected to determine the published geology (Ref. 4).

### **2.4. Coal Mining**

A mining report obtained from the Coal Authority was included in the previous investigation undertaken by SDA for UKCM, the main findings of which are summarised in this report.

Copies of mine abandonment plans and opencast completion plans relating to workings in the Kent's Thick seam are included in **Appendix A**.

Additional information relating to proposals for developing an opencast mine at the site was obtained from UKCM including borehole logs and mine development plans.

### **2.5. Historical Maps**

Previous editions of the Ordnance Survey (OS) maps of the site dating from 1854 were inspected to establish the site history.

A description of the site history based on the maps is presented in the report to UKCM, the main findings of which are summarised here.

### **2.6. Aerial Photographs**

Aerial photographs of the site dating from 1948 were obtained from the National Monuments Records of English Heritage. Due to copyright restrictions it is not possible to reproduce the photographs in this report.

In addition, a series of recent oblique aerial photographs of the site were specially commissioned by SDA for the purpose of the ground investigation.

## **2.7. Landmark Environmental Database**

The Landmark Environmental Database was consulted to provide information on the environmental status of the site. The Landmark Report is included in the report to UKCM, although the main findings are summarised here.

## **2.8. Previous Investigations**

The main findings of the previous investigations carried out at the site (see Section 1.2) are summarised later in this report.

### **3. SITE DESCRIPTION**

#### **3.1. Regional Setting**

The site is located between the villages of Mapplewell, Staincross and Blacker and is some 1.5 km east-south-east of Darton.

The National Grid Reference (NGR) for the centre of the site is 433,050E and 409,650N.

#### **3.2. Site Features**

##### **3.2.1. Topography and Land-Use**

The site comprises a series of broad terraces formed in colliery spoil which gradually fall to the south.

In the north-west, the site boundary passes around the edge of a football pitch located within an area of raised ground. To the north, the site is bordered by modern warehousing and factory buildings.

The eastern site boundary is formed by Carr Green Lane, beyond which lies an area of modern housing. The south-east boundary of the site passes around a number of commercial and residential premises located off Carr Green Lane.

The southern boundary of the site is defined by a strip of recently planted birch woodland on the northern margin of a large reclaimed colliery spoil tip. The reclaimed tip is presently used as grazing pasture. The site is bordered to the west by residential properties located on Spark Lane.

##### **3.2.2. Surface Drainage**

Surface run-off is generally directed to the south-west. Deep erosion gullies are present in many locations where colliery spoil is exposed at the surface.

An area of marshy ground is present in the south-west corner of the site. Surface drainage is mostly directed to this part of the site.

##### **3.2.3. Site Access**

The principal access into the site is via a narrow gated track located in the south-east corner of the site.

##### **3.2.4. Existing Services**

The site is crossed by two overhead electricity lines and an underground sewer, the latter in the southern half of the site.

### **3.3. Area Designations**

For the purposes of this report, the site can be split into five principal areas as described below.

#### **3.3.1. Area 1 – North-West Recreational Area**

*This area includes the land presently occupied by the football pitch. The site generally comprises colliery spoil sloping down to Area 2.*

#### **3.3.2. Area 2 – North-West Rail Sidings Area**

The majority of this area consists of relatively flat-lying ground previously occupied by railway lines and sidings. The site contains some dereliction with areas of demolition rubble and old concrete foundations and structures.

#### **3.3.3. Area 3 – Central Spoil Area**

The majority of this area comprises trees and shrubs located on gently sloping ground comprising mostly colliery spoil. The eastern part of the site includes several concrete structures, while in the south a major drainage ditch, which is partially culverted, trends north-west to south-east.

#### **3.3.4. Area 4 – Southern Lagoon Area**

The southern part of this area was previously occupied by old slurry and tailings lagoons and now comprises relatively flat-lying ground with areas of marshy ground in the west. Surface water drains to the south-east corner through a ditch.

#### **3.3.5. Area 5 – North-East Industrialised Area**

The north-east part of this area is characterised by widespread dereliction, areas of concrete hardstanding and remnant brick and concrete foundations and structures.

### **3.4. Area Plan**

A detailed plan showing the approximate extent of all five areas is included as **Figure 2**.

### **3.5. Site Geology**

#### **3.5.1. BGS Data**

The BGS map of the site indicates little or no superficial cover with Middle Coal Measures strata at or close to the surface.

The Coal Measures succession includes the economically significant Kent's Thick (AZ) and Barnsley (AVX) seams, both of which have been worked in the area. The sub-crop of the Kent's Thick seam crosses through the site as shown on **Figure 3**.

The Barnsley seam lies approximately 60m below the Kent's Thick seam and is therefore not within influencing distance of the surface. A number of other thinner seams, such as the Kent's Thick Rider (1AZ) and Barnsley Rider (AY), are also present but are not of economic significance.

### **3.5.2. Filled Ground**

The majority of the site is covered by made ground which comprises colliery spoil. Boreholes drilled by BCOE indicate made ground between 0.6 and 9m thick. Boreholes drilled by SDA on behalf of UKCM confirm similar thicknesses (i.e. 3.5 to 13.8m).

The thickness and distribution of the made ground deposits is shown on **Figure 4**. The thickest deposits are present in the north-west corner of the site and beneath the shoulders of the terraced areas.

### **3.5.3. Glacial Till**

Previous investigations confirmed the presence of a thin layer of glacial till overlying bedrock with recorded thicknesses up to 4.4m in the south of the site.

### **3.5.4. Coal Measures Bedrock**

A plan showing rockhead contours is included as **Figure 5**.

## **3.6. Coal Mining**

### **3.6.1. Coal Authority Report**

The report confirms that the site is located within the likely zone of influence on the surface from workings in nine seams of coal at shallow to 340m depth, with the last date of working being 1981.

Although the site is not located within a geographical area for which further coal extraction has been licensed or is awaiting licence, reserves of coal exist which could be worked in the future.

A total of eight mine entries (five shafts and three adits) are reported in the site or within 20m of the site boundary. Few treatment details are available regarding these entries and it is possible that some have not been adequately stabilised. Further investigations will be required to positively identify the location of the entries and establish their current state.

A number of suspected gas vents into deep mine workings are present in Area 1, the approximate position of which are shown on **Figure 3**.

The report confirms that the site is located within 800m of the geographical site boundary of the Barugh Bridge prospective opencast site for which a conditional licence to extract coal was granted in 1994.

### **3.6.2. Mine Abandonment Plan**

The Kent's Thick and Barnsley seams were worked underground from the former North Gawber Colliery.

The Barnsley Seam workings are deep enough not to influence the surface. However, the workings in the Kent's Thick seam have been recorded at relatively shallow depth beneath the site.

An extract of the deep mine abandonment plan (dated 1920) is included within **Appendix A**.

### **3.6.3. Former Opencast Workings**

Former opencast workings along the outcrop of the Kent's Thick seam have been identified in Area 4.

A plan showing the approximate location of these backfilled excavations, as well as an outline of the deep mine workings in the same seam, is included as **Figure 3**.

The workings were undertaken in 1974 for the construction of a number of slurry lagoons; a mine completion plan presenting these details is contained in **Appendix A** which also indicates the existence of previously unrecorded deep workings.

## **3.7. Historical Development**

### **3.7.1. Preamble**

Copies of the OS maps of the site are provided in the previous report carried out for UKCM.

The following represents a summary of the site history, while the locations of the main historical features are shown on a plan included as **Figure 6**.

### **3.7.2. OS Maps**

The site remained largely as agricultural land until the latter half of the 19<sup>th</sup> Century. The earliest OS map dated 1854 shows the site to be occupied by numerous small fields with only one solitary structure in the centre of the site identified as an 'Old Engine'.

Mining at North Gawber is known from at least 1849, but the earliest any activity is indicated is on a map dated 1893. This shows the presence of colliery buildings, several shafts and coke ovens in the north-east of the site and a mineral railway with rail sidings crossing from Spark Lane in the west to Carr Green Lane in the east.

Subsequent OS maps over the next 50 years or so indicate very little development apart from a gradual westerly and southerly expansion of the spoil tipping area alongside the railway and to the south of the coke ovens.

The original North Gawber Colliery is known to have closed in 1922 and a new colliery opened in 1926 which was then extended in 1949. The 1956 map indicates significant changes which include demolition of the coke ovens and associated structures, construction of new colliery buildings in the north-east corner of the site, expansion of the colliery spoil tip in the north-west of the site, and the construction of an aerial ropeway depositing spoil on a large tip to the south-west of the site.

Further developments during the 1960's included the construction of several sets of lagoons in the south-east of the site, an expansion of the main tipping areas in the north-west and into the southern margin of the site, and the construction of overhead electricity power lines in the east of the site.

By 1973, the colliery spoil heaps in the northern, central and southern parts of the site had all become disused and the aerial ropeway dismantled. A map dated 1974 shows a conveyor crossing Carr Green Lane to another tip located east of the site.

The 1974 map also shows a number of additional slurry ponds in the south-east of the site. Several other sets of slurry and tailings ponds are shown on the 1977 map located across the southern part of the site, including those constructed on backfill within a former opencast excavation developed on the crop of the Kent's Thick seam in the south-east corner of the site.

The North Gawber Colliery was eventually closed in 1988. The 1993 map shows considerable changes to the site with the demolition and removal of the colliery buildings, dismantling of the railway lines, sidings and conveyor, reclamation of the spoil heap to the north-west of the site to create a football pitch, backfilling of the slurry lagoons, reclamation of the tip to the south of the site and construction of new light industrial units to the north and south-east of the site.

Other historical information relating to the site (dated 1982) indicates that a broad area south of the railway and extending into Area 3 was levelled off and utilised as a coal stocking ground. The same plan shows that the lagoons in the south-west of the site acted as drying areas for dredged tailings.

### **3.7.3. Aerial Photographs**

A series of photographs taken just after the end of the Second World War in 1948 confirms demolition of the coke ovens and some of the older colliery buildings. The spoil tips to the north-west and south-west of the site are evident with colliery spoil being deposited on the latter tip via an aerial ropeway. The 'Engine House' is also evident in the centre of the site.

A photograph taken in 1951 generally confirms the layout of the colliery buildings as shown on the 1962 OS map. Photographs taken in 1954, 1955 and 1957 show the progressive



expansion of the main tip to the south-west of the site and areas of localised tipping to the south of the railway line.

Photographs taken in 1966 confirm the presence of the main slurry lagoons in the south-west (where the marshland now exists) and in the south-east of the site (not indicated by the OS maps until 1974 and 1977).

Photographs taken in 1970 indicate no further tipping to the south of the site. A photograph taken in 1972 confirms the construction of various concrete structures in the north-east corner of the site.

A photograph dated 1973 confirms that the southern part of the main tip was used as a coal stocking ground. Several impoundments or stockpiles are shown on the tip in the north-west corner of the site.

The opencast excavation in the south-east corner of the site is evident on photographs taken in 1974. By 1976, the excavation was restored and a new set of lagoons constructed over the former excavation. The same photograph shows a coal stocking ground on the tip area in the north-east corner of the site. A photograph taken in 1977 shows a concrete road leading to the new lagoons on the east side of the site.

The 1978 photograph shows re-shaping of the tip in the north-west corner of the site followed by the construction of the football pitch. At about this time a series of what look like concrete lagoons for water settlement or separation were constructed along the toe of the slope below the football pitch. A photograph taken in 1980 shows the now restored tip area located south of the site. However, the lagoons are not thought to have been restored until sometime after 1981.

A series of photographs taken in 1989 confirm the widespread demolition of the former colliery buildings, backfilling of the former lagoons and re-shaping of parts of the main tip. Evidence of further re-shaping of the tip and the development of various industrial premises can be seen in a photograph taken in 1997.

### **3.8. Landmark Environmental Database**

#### **3.8.1. Preamble**

*A copy of the Landmark Report dated 2004 is included in the report prepared by SDA for UKCM.*

#### **3.8.2. Agency and Hydrological Data**

Within the search area, the report lists four air pollution controls located more than 800m east of the site.

Three discharge consents for sewage and storm effluent operated by Yorkshire Water Services Ltd. are listed 62m south of the site. A total of seventeen other discharge consents are listed in the area but these are located more than 600m from the site.

The nearest surface water feature is located on the site, taking surface drainage from the site as discussed previously.

Four pollution incidents to controlled waters are reported within 80m of the site. Two relate to discharges of chemicals/detergents from industrial premises on Carr Green Lane; two others were recorded as unknown sewage discharges located to the north of the site. The incidents are listed as Category 3 (Minor Incidents).

The substantiated pollution incident register lists one incident in the north of the site resulting from a fire. Two incidents are listed 72m south of the site involving oils and crude sewage; four other similar incidents are listed more than 800m from the site.

The River Dearne is assigned a GQA river quality grade C. One water abstraction is listed 1.3 km west of the site. The site is not indicated to be at risk from flooding.

Aquifers are classified as either major, minor or non-aquifers depending on the amenity value of the resource. A major aquifer would be a significant resource capable of producing large amounts of water. Minor aquifers are generally of local importance only. Non-aquifers comprise low permeability strata with limited groundwater abstraction potential. With respect to this site, the underlying bedrock is classed as a variably permeable minor aquifer.

Soils in the area are classed as having high leaching potential where pollutants in the soil are likely to penetrate the soil layer and the soils do not have the ability to attenuate diffuse pollutants.

### **3.8.3. Waste and Hazardous Substances Data**

One licensed waste management facility is reported 183m east of the site at Wentworth Road. The licence is registered to Mapplewell Autosalvage Ltd.

A Local Authority recorded landfill site is listed in the same area, but no details are available. Three other landfill sites are listed more than 500m south-west and north-east of the site.

One registered landfill site is reported 43m east of the site. The site is listed as Blacker Hill Quarries Ltd. but the license is no longer active. Another site is listed 265m south-west of the site in the name of the former National Coal Board (NCB) for construction and demolition wastes. Three other registered landfill sites are listed more than 600m from the site.

One registered waste transfer site is listed 186m east of the site on Wentworth Road for non-hazardous and potentially combustible waste. One registered waste treatment or disposal site is also reported in the same locality in the name of Mapplewell Autosalvage Ltd.

Within the search area there are no reported hazardous substances sites.

### **3.8.4. Geological Data**

The solid geology is described as belonging to the Lower Westphalian (Productive Coal Measures). Eighty three BGS boreholes are recorded within 1km of the site.

The site is reported to be in an area affected by coal mining; shallow mining hazards are rated as low to moderate. The risk of subsidence hazards within the site due to gulls and cambering is described as low, as are landslip subsidence hazards.

Data provided by the National Radiological Protection Board confirms that between 1 and 3% of homes are above the Action Level for radon gas. The BGS confirms that basic radon gas protective measures are required at the site.

#### **3.8.5. Industrial Land-Use Data**

The database lists forty seven contemporary trade directory entries within the search area, the nearest of which is Specialised Aerosols Ltd. adjacent to the south-east corner of the site.

#### **3.8.6. Sensitive Land-Use Data**

The site borders an area of adopted green belt and is also located within a nitrate vulnerable zone.

#### **3.8.7. Summary of Data**

The principal findings from the Landmark Environmental Database are listed below:

- A surface water features receives the majority of site drainage in the south-east corner of the site. The water is discharged into an un-named tributary of the River Dearne.
- Waste materials present at the site include some combustible items.
- The site is not at risk from flooding.
- The soils in the area are classed as high leaching potential and the Coal Measures strata are a minor aquifer.
- A waste management facility/treatment site is located close to the site on Wentworth Road. The site is used for recycling scrap metal and for the disposal of scrap vehicles and tyres.
- The site is located in an area affected by coal mining with the potential for shallow mining hazards and instability.
- Between 1% and 3% of homes within the area are above the Action Level for radon gas. Basic radon gas protective measures are required as detailed later in this report.
- The contemporary trade directory lists Specialised Aerosols Ltd. located adjacent to the south-east corner of the site as a company involved in the packaging of chemicals.
- The site does not include any sensitive land-uses, although it borders an area of adopted green belt and lies within a nitrate vulnerable zone.

### **3.9. Previous Studies**

#### **3.9.1. British Coal Desk Study**

The desk study compiled by British Coal in 1990 (Ref. 1) provides a useful summary of past activities at the site, the main findings of which are described below.

In addition to coal mining, coke and gas production was carried out at the site with the by-products from carbonisation processed at one of the nearby chemical works. Potential contamination includes polyaromatic hydrocarbons (PAHs), petroleum hydrocarbons, phenols, sulphates and cyanides.

Specialised Aerosols Ltd., which is located adjacent to the south-east corner of the site, produces cleaning and maintenance products. Chemicals are not manufactured at the site but concerns in relation to this activity would be in the event of spillages or inappropriate handling of chemicals.

The former Staincross Vitriol Works, which was located to the north-east of the site on the opposite side of Carr Green Lane, manufactured acids for bleaching and industrial cleaning purposes. Waste products would have included pitch/tar, phenols, acid residues, heavy metals, cyanide and sulphates.

#### **3.9.2. BCOE Exploration Drilling**

The North Gawber site was extensively drilled by BCOE in the early 1990's in connection with a proposed opencast site. A series of plans were produced based on the borehole data which have been examined as part of this study.

Relevant information extracted from the borehole logs is shown in **Figures 4 and 5**.

#### **3.9.3. SDA Investigation for UKCM**

The investigation (Ref. 2) comprised the excavation of twenty nine trial pits and the drilling of twenty cable percussion boreholes.

The main findings of the investigation are listed below:

- The trial pits were excavated to depths in the range 0.8 to 3.5m. Some of the trial pits were terminated at shallow depth on buried sub-structures.
- The cable percussion boreholes were drilled to depths in the range 4.4 to 14.1m. Gas and groundwater monitoring standpipes were installed in six boreholes.
- Made ground deposits comprising fine and coarse colliery discard and demolition arisings were encountered across the entire site to depths ranging from 3.5 to 13.8m, with the thickest deposits present in the north-west of the site.

- Thin deposits of glacial till were encountered across much of the site beneath the made ground deposits. Where present, they ranged in thickness from 0.3 to 2.5m.
- Bedrock comprising mudstone, siltstone and sandstone was encountered in the boreholes at depths ranging between 3.6 and 13.8m bgl.
- Perched groundwater was encountered in the superficial deposits. Groundwater in the underlying Coal Measures strata is thought to be under-drained by old mineworkings in the Kent's Thick and other worked seams.
- Gas monitoring indicates elevated carbon dioxide up to 5.4% by volume.
- Chemical analysis indicates elevated concentrations of arsenic, sulphate and TPHs (mineral range organics) in the made ground deposits across large parts of the site, with localised 'hotspots' of arsenic, copper, sulphide, TEM and PAHs. The analysis confirms acidic conditions in the colliery spoil deposits.
- Tests on groundwater samples indicate elevated levels of hydrocarbons (TPHs) and sulphates. Leachate tests indicate that the majority of contaminants are not soluble except in samples displaying low pHs.
- The former colliery and especially the coke works represent the principal source of contamination, although the colliery spoils are a prime source of certain heavy metals, sulphates and low pH's.

### 3.10. Implications for Development

The findings from the desk study and the previous ground investigation raise concerns about a number of key issues with potential implications for the re-development of the site.

These issues are listed below and have been addressed by the ground investigation described in this report:

- *The presence of significant quantities of colliery spoils at the site. Principal risks relate to combustibility and the presence of elevated levels of heavy metals, sulphates, sulphides and low pHs. The uncontrolled nature of the tipping may have given rise to areas of loose and unstable ground.*
- The former coke works could represent a potentially significant source of contamination. Any such contamination may have been re-located to other parts of the site during the demolition and site clearance works.
- The former colliery buildings could represent a source of chemical contamination due to spillages of fuels and lubricating oils.

- Given the history of industrial development within and adjacent to the site, there is the potential for migration of contamination and the importation of waste materials into the site from elsewhere.
- Successive phases of industrial development and demolition have created the potential for significant remnant foundations and sub-structures.
- The presence of shallow underground mineworkings, shafts and adits represent a potential subsidence hazard if left untreated.
- The presence of former slurry lagoons and tailing ponds represent a potential hazard for foundations.
- The presence of gases including carbon dioxide, methane and radon represents a potential hazard to the end-users.

## **4. FIELDWORK & LABORATORY ANALYSIS**

### **4.1. Preamble**

In order to supplement the information obtained from the previous investigations, a ground investigation was undertaken by SDA in September and October 2007.

The fieldwork comprised the following:

- The excavation of seventy five trial pits (designated TPs 1 to 79) across the entire site;
- The drilling of seventeen rotary open holes (designated BHs R01 to R17) to investigate the presence of shallow mineworkings and to record the thickness of the made ground deposits;
- The boring of eighteen light cable percussion boreholes (designated BHs 101 to 118) to investigate the superficial deposits;
- The installation of seven gas and groundwater monitoring standpipes in the light cable percussive boreholes.

The ground investigation was undertaken in accordance with BS 5930 (Ref. 5) and BS 10175 (Ref. 6). The locations of the exploratory holes are shown on **Figure 2**.

### **4.2. Trial Pits**

Trial pits were excavated using a JCB 3CX hydraulic excavator to depths in the range 0.6 to 4.8m bgl.

Samples were taken from the trial pits comprising small disturbed samples for chemical analysis and bulk disturbed samples for geotechnical analysis. Samples were generally taken at 1.5m intervals and at each significant change in soil type.

Attention was paid during the site works to recording areas of made ground and water-bearing strata. In addition, an assessment was made of the side wall stability of the excavations.

Copies of the trial pit logs are included in **Appendix B**.

### **4.3. Rotary Open Hole Boreholes**

The rotary open hole boreholes were drilled by JB Site Investigations Ltd. using a Dando Geotech hydraulic drilling rig to depths in the range 3.5 to 26m bgl.

BHs R01 to R10, R16 and R17 were drilled to investigate the presence or otherwise of old mineworkings in the Kent's Thick seam. BHs R11 to R15 were drilled to confirm the

thickness of made ground in areas where the trial pits and cable percussion boreholes were prematurely terminated on obstructions.

Copies of the rotary open hole logs are included in **Appendix C**.

#### **4.4. Cable Percussion Boreholes**

The cable percussion boreholes were drilled by JB Site Investigations Ltd. to depths in the range 4 to 13m bgl. All of the boreholes were terminated in bedrock.

Standard Penetration Tests (SPTs) were carried out in granular materials or bedrock to provide an empirical assessment of density. Driven undisturbed tube samples (U100 samples) were taken in cohesive strata.

Gas and groundwater monitoring standpipes comprising 50mm diameter well screen (slotted and un-slotted) were installed in selected boreholes. The installation details are shown on the borehole logs.

Copies of the cable percussion borehole logs are included in **Appendix D**.

#### **4.5. Laboratory Analysis**

##### **4.5.1. Preamble**

Samples were submitted for a range of geotechnical and chemical analyses carried out in accordance with schedules prepared by SDA.

The geotechnical analyses were undertaken by Professional Soils Laboratory Ltd. (PSL) of Doncaster. The chemical analyses were undertaken by Chemtech Environmental Ltd. (CEL) of Consett.

##### **4.5.2. Geotechnical Analysis**

Laboratory analyses were carried out on selected disturbed and undisturbed samples in accordance with BS 1377 (Ref. 7).

The following tests were carried out:

- Natural moisture content, Atterberg limits, particle size distribution (PSD) tests, quick undrained triaxial compression tests, compaction tests (2.5 kg rammer method), moisture condition value (MCV) tests, and California Bearing Ratio (CBR) tests.

The test certificates are included in **Appendix E**.

##### **4.5.3. Chemical Analysis**

Soil samples were analysed for the following:



- Arsenic, water soluble boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, pH, sulphate, sulphide, cyanide, toluene extractable matter (TEM), loss on ignition (LOI) and organic matter content.

Selected samples were also analysed by microscopy for asbestos fibres.

Further analyses were carried out on those samples exceeding certain screening values as follows:

- Calorific value (CV) tests on samples with loss on ignition values greater than 25% by weight. Samples above this value are generally considered to be potentially combustible (Ref. 8).
- Total sulphur, water soluble sulphate and water soluble magnesium on samples with total sulphate levels exceeding 5,000 mg/kg.
- Phenols, total PAHs and petroleum hydrocarbons (speciated for carbon bands C<sub>5</sub>-C<sub>10</sub> (petrol range – GRO), C<sub>10</sub>-C<sub>28</sub> (diesel range – DRO) and C<sub>28</sub>-C<sub>40</sub> (mineral oil range – MO) on those samples with TEM levels exceeding 500 mg/kg.
- Speciated PAHs (EPA 16 priority compounds) for those samples with total PAHs above 15 mg/kg (equivalent to the Generic Soil Screening Value determined for a sandy soil with 5% organic matter and based on a residential land after-use with plant up-take).
- Further speciated TPHs (aliphatic and aromatic carbon split) for those samples found to exceed the GSSVs for any one of the previously speciated TPH ranges (based on a sandy soil with 5% organic matter content and a residential land after-use with plant up-take).

Leachability tests were carried out on those soil samples with the highest levels of contamination. Both the leachate samples and groundwater samples taken from the standpipes installed in BHs 101, 104, 105, 109, 112, 115 and 118 were analysed for the following:

- Arsenic, water soluble boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, pH, sulphate, sulphide, cyanide, phenols, total PAH and total TPH.

The result summary sheets are included in **Appendix F**. Tabulated results which form part of the contamination assessment (see Section 6) are included in **Appendix G**.

#### 4.6. Standpipe Monitoring

Standpipes installed in BHs 101, 104, 105, 109, 112, 115 and 118 were monitored for groundwater level, gas concentrations (oxygen, carbon dioxide and methane) and flows.

The gas monitoring was undertaken using an infra-red gas analyser and flow pod attachment. The monitoring results are provided in **Appendix H**.

## 5. GROUND CONDITIONS

### 5.1. Preamble

The site has been split into five areas largely on the basis of past industrial land-use. The following discussion on ground conditions is based on the findings of this and the previous ground investigation undertaken by SDA for UKCM.

For the purpose of the following discussion, the SDA investigation for UKCM is referred to as the 2005 investigation.

The general distribution of soil types present across the site is shown on the geological cross sections included as **Figures 7 to 10**. In compiling these sections, use has been made of all the exploratory holes including those from the previous investigations as listed in the legend.

It should be noted that the ground conditions between the exploratory holes are approximate only and significant variations in material type can occur over relatively short distances. The groundwater conditions shown on the cross sections are those identified at the time of the investigation and during the subsequent monitoring. However, it should also be noted that changes in groundwater levels can vary due to seasonal factors.

The site comprises variable types of made ground overlying thin deposits of glacial till. These deposits are underlain by Coal Measures bedrock. In places, glacial till is absent and made ground directly overlies bedrock.

### 5.2. Topsoil

Topsoil is generally absent from the site. Where present, it is of poor quality and typically less than 0.2m thick.

A number of the trial pits excavated during the 2005 investigation encountered thin deposits of soft and firm, grey and black, sometimes peaty SILT/CLAY directly below the made ground deposits. These deposits may represent a relict topsoil horizon which in most cases is of fairly limited thickness (typically 0.3 to 0.9m thick).

A moderately strong hydrogen sulphide odour was detected in some of the trial pits where the relict topsoil horizon was present.

### 5.3. Made Ground

#### 5.3.1. Preamble

Made ground was encountered in all of the exploratory holes. The thickness and composition was found to vary widely but for the most part the made ground comprises four principal soil types which are described as follows:

- Unburnt, coarse colliery discard – typically firm, friable, dark grey, clayey, sandy GRAVEL or sandy, gravelly CLAY with gravel of angular shale, sandstone, mudstone, coal, ash and slag. These deposits also contain variable amounts of cobbles and boulders.
- Burnt, coarse colliery discard – typically red or brown, sandy GRAVEL of subangular burnt shale and clinker. These deposits also contain variable amounts of cobbles and boulders.
- Fine colliery discard – typically soft and firm, black, sandy SILT or CLAY with coal and shale.
- Demolition arisings – typically concrete, brick, tarmacadam, timber, metal plates and bars, iron girders, various pipe work, fabric, machine belts, plastic, rubber, nails, cables and glass.

The thickness of the made ground is shown on the plan included as **Figure 4**.

It should be noted that in most cases it is relatively easy to distinguish between the soil types described above based on visual assessment only.

#### 5.3.2. Area 1

The made ground deposits are between 4 and 13.8m thick and comprise mainly medium dense and dense, coarse colliery discards.

An isolated pocket of fine discard was identified in TP 2 at the location of a suspected former pond.

No remnant foundations or sub-structures were identified within this area of the site. However, British Coal records indicate that part of this area may comprise backfilled opencast workings (see **Figure 3**) although no evidence has been found of any such workings in this investigation.

#### 5.3.3. Area 2

The made ground deposits are between 1.2 and 7m thick, being thickest in the north and south. The materials comprise a mixture of medium dense, burnt and unburnt colliery discards.

Localised areas of concrete foundations and demolition arisings were identified in the vicinity of several old structures still visible on the surface as indicated in **Figure 2**.

Buried sub-structures were identified at 2.1m bgl in TP 8, 1m bgl in TP10 (resting directly on the underlying glacial till), 0.6m bgl in TP11 and 2.6m bgl in TP 12.

#### 5.3.4. Area 3

This area represents the main part of the former North Gawber Colliery spoil tip.

The made ground deposits are from 1.8 to more than 4.2m thick and comprise a mixture of medium dense, burnt and unburnt, coarse colliery discards.

In the south of the area (BH 112), a 2.9m thick horizon of soft, wet silt with a strong organic odour was noted resting directly on glacial till. This may represent fine discards including the accumulation of some sediment resulting from erosion of the colliery spoil deposits.

No buried foundations or sub-structures were identified within this part of the site and the only surface concrete encountered was a former paved road located at the east end of the area (as identified in TPs 24 and 25).

#### 5.3.5. Area 4

Area 4 comprises the former lagoon and slurry ponds in the southern part of the site. The made ground deposits are between 0.5 and 8.5m thick, being thickest along the southern edge of the site adjacent to the reclaimed spoil heap.

The made ground comprises mostly loose to medium dense, burnt and unburnt, coarse colliery discards. Fine discards, 0.5 to 2.9m thick, were identified in and adjacent to some of the former tailings ponds in the south and west of the area (notably in TPs 37, 40, 43 and BHs 112, 116, 117 and 118).

Some brick and concrete foundations (reinforced) were identified at 3m bgl in TP 35 and at 2.5m bgl in TP 36. An underground sewer is known to be routed through this part of the site as mentioned previously.

#### 5.3.6. Area 5

This area represents the most industrially developed part of the site in which the made ground deposits include a significant proportion of demolition arisings, waste materials, remnant foundations and other buried brick and concrete (possibly reinforced) sub-structures.

The made ground deposits are between 0.8 and 10.1m thick and comprise mostly medium dense, burnt and unburnt, coarse colliery discards. It should be noted that the demolition arisings are extremely variable in composition.

Brick and/or concrete foundations visible at or near to the surface were confirmed in TPs 47, 49, 51, 62, 63, 64, 67, 70, 71, 72, 74, 75 and 76 as highlighted in **Figure 2**. These were found to extend to depths up to 2.1m bgl.

Other buried brick and concrete foundations and sub-structures were identified at depths between 1.6 and at least 4m bgl in TPs 52, 53, 54, 55, 56 and 58 (also shown in **Figure 6**).

These are believed to represent the remains of the former coke ovens. No evidence of any significant contamination was found in the vicinity of these foundations.

Elsewhere, buried foundations and sub-structures including brick walls etc. were identified in TPs 71, 73, 75, 76 and 77 at 2.5 to 3.6m bgl. Buried remnant foundations and sub-structures were encountered during the 2005 investigation in TPs 17, 18, 24 and 25 at 2.1m to 3m bgl and BHs 14 and 15 at 2.1m to 3.6m bgl.

It should be noted that hydrocarbon odours were noted in TP 64 above a 0.7m thick horizon of fine discards. During the 2005 investigation, hydrogen sulphide and hydrocarbon odours were recorded in TPs 14 and 15 respectively. No other visual or olfactory evidence of contamination was found in this area of the site.

#### 5.4. Glacial Till

Glacial till generally comprises firm and stiff, sometimes soft, light grey, mottled light brown, silty, sandy, sometimes gravelly CLAY with occasional cobbles. The gravel comprises shale, siltstone, sandstone, mudstone and coal.

In Area 1, the glacial till deposits are up to 2.5m thick but occasionally absent. In Areas 2 and 3, the glacial till deposits are poorly developed with a maximum recorded thickness of 2.5 and 1.9m respectively.

The glacial till deposits in Area 4 are better developed with thicknesses in some locations in excess of 2.7m although the full thickness was not always proven. In Area 5, a number of the exploratory holes were unable to penetrate deep enough to reach the underlying glacial till deposits or prove its full thickness. However, where this was possible, a maximum thickness of 2.7m was recorded but frequently glacial till was absent. Occasional horizons of gravel were encountered in TPs 67 and 70.

#### 5.5. Bedrock

A plan showing rockhead contours is included as **Figure 5**.

Coal Measures bedrock was encountered at the following depth ranges in each of the five designated areas:

- Area 1 – 4.6 to 13.8m bgl;
- Area 2 – 2.8m to 8.2m bgl;
- Area 3 – 3.5m to 4.9m bgl;
- Area 4 – 2.5m to 9.1m bgl;
- Area 5 – 1.4m to 10.1m bgl.

The rotary boreholes indicate bedrock comprising a sequence of sandstones, mudstones, siltstones and coal. A coal seam, thought to be the Kent's Thick seam and some 0.3 to 1.2m thick but averaging 1m thick, was encountered at depths in the range 1.1 to 18.2m below rockhead, becoming deeper to the north and east.

The depths at which the Kent's Thick seam was identified in the rotary boreholes ties in very closely with the findings from the BCOE exploration drilling undertaken in the early 1990's.

Broken ground resulting in air flush loss was recorded in BHs R01 and R02. The broken ground was recorded between 0.8 and 1.1m thick and is thought to indicate the presence of unrecorded old mineworkings. Flush losses were also recorded in BH R07 in a 0.8m thick horizon comprising soft coal at a depth of 1.1m below rockhead, through which the drill rods sank under their own weight without any rotation.

The borehole was drilled very close to an area of previously unrecorded underground workings that were identified in the old opencast excavation in Area 4 and the coal intersection most likely represents an old pillar.

## 5.6. Mineworkings

The location and layout of former opencast and recorded old underground mineworkings in the Kent's Thick seam are shown in **Figure 3**. These details were digitised from the mine completion and abandonment plans included in **Appendix A**.

The exploratory drilling carried out by BCOE in the 1990's, and the recent rotary open hole boreholes carried out by SDA, generally confirm the location of these workings but also suggest the possibility of additional shallow workings elsewhere within the site.

An area of previously unrecorded workings was also identified during the opencast operations which took place along the crop of the Kent's Thick seam in the east of the site (in Area 4).

The conclusion drawn from these findings is that there is a possibility of other unrecorded workings present at the site which could have been developed from adits into the coal seam at various locations along its sub-crop. Additional workings may also be present that were not included on the surveyed mine plans.

Guidance stipulates that where shallow mineworkings are present, remedial works are required where the ratio of solid rock cover to extracted seam thickness is less than 10:1. This is based on the assumption that void migration above old pillar and stall workings is unlikely to extend higher than about 10 times the seam thickness above the worked seam in typical Coal Measures strata.

The position of the 10:1 solid cover line is shown in **Figure 3** and is based on an assessment of all the available rotary borehole information and assuming an average seam thickness of 1m. The area between the sub-crop of the Kent's Thick seam and the 10:1 ratio line within which remedial works will be required is estimated at 43,000 m<sup>2</sup> (or 4.3 ha).

## 5.7. Groundwater

Groundwater was encountered in a number of the trial pits, usually as small, steady seepages from various levels between 2 and 4m bgl (i.e. within the made ground deposits), although

more commonly from at or close to the interface between the made ground and the underlying less permeable glacial till deposits.

Many of the seepages are thought to be associated with natural surface drainage features and existing areas of low-lying ground.

Groundwater was only encountered in one of the cable percussion boreholes (BH 118) and just one strike was reported during the rotary drilling in BH R01 at 8m bgl in mudstone, rising to 6.2m bgl in 20 minutes.

The groundwater monitoring carried out to date (January 2008) of standpipes installed in BHs 105, 109, 112, 115 and 118 indicate groundwater levels in the range 0.3 to 7m bgl (BHs 101 and 104 were initially found to be dry). These readings suggest groundwater at elevations between 71.6 and 87.6m AOD, with a hydraulic gradient generally from north to south across the site.

The results are tabulated in **Appendix H**.

## **5.8. Gas Monitoring**

The gas monitoring carried out to date (January 2008) indicates negligible levels of methane (0.0 to 0.1% by volume) and low to moderate levels of carbon dioxide (0.0 to 11.8% by volume) with negligible flows (up to 0.3 litres/hour).

It is recommended that monitoring is continued for at least six months (approximately nine readings in total) following which a detailed gas risk assessment should be carried out.

The results are tabulated in **Appendix H**.

## **5.9. Geotechnical Parameters**

### **5.9.1. Preamble**

The geotechnical results based on laboratory testing of samples taken during the current phase of ground investigation are presented in the following sections.

The test certificates are included in **Appendix E**.

### **5.9.2. Made Ground**

SPTs carried out in the cable percussion boreholes indicate a wide range of 'N' values from less than 5 to greater than 50, but generally in the range 10 to 30, suggesting mostly medium dense conditions. However, it should be noted that very loose conditions were identified in BHs 112, 113, 117 and 118 within areas formerly occupied by slurry lagoons (fine discards).

Natural moisture contents lie in the range 9 to 26% (average 17%) for the unburnt coarse discards, 6 to 30% (average 18%) for the burnt coarse discards and 12 to 41% (average 25%)

for the fine discards. These results suggest very little difference between the coarse discards, although as expected, the fine discards exhibit significantly higher moisture contents.

Atterberg limit tests on four samples of predominantly clayey unburnt coarse discards indicate liquid and plastic limits in the range 37 to 47% (average 41%) and 20 to 23% (average 21%) respectively. These results indicate intermediate plasticity.

Atterberg limit tests on six samples of fine discards indicate liquid and plastic limits in the range 36 to 59% (average 47%) and 19 to 43% (average 26%) respectively. These results indicate a variable deposit comprising intermediate plasticity clay and high plasticity silt.

Particle size distribution tests indicate that in general the coarse discards comprise clayey, silty, sandy to very sandy GRAVEL with cobbles. The fine discards mainly comprise very clayey and silty, slightly sandy GRAVEL or slightly clayey, very sandy SILT. However, it should be noted that due to inevitable sampling bias, the PSD test results may underestimate the percentage of cobbles and boulders.

Compaction tests on the coarse discards indicate maximum dry densities in the range 1.44 to 1.84 Mg/m<sup>3</sup> (mean result of 1.64 Mg/m<sup>3</sup>) and optimum moisture contents ranging between 12 and 22% (mean result of 17%). These results suggest that the coarse discards will generally be compacted slightly wet of optimum which is in keeping with results from similar materials at other former colliery sites. It should be noted that the self-compaction density achieved in old spoil heaps by loose tipping is generally around 95% of the average achieved in laboratory compaction tests (2.5 kg rammer). In the case of fine discards, a single test result indicates a maximum dry density of 1.33 Mg/m<sup>3</sup> at an optimum moisture content of 20%.

CBR tests carried out on the coarse discards at natural moisture content indicate results in the range 0.6 to 41.6%, with a mean of 22% which is in keeping with results from similar materials at other former colliery sites. As expected, much lower CBR values in the range 0.2 to 0.3% were obtained for the fine discards.

MCV tests carried out at natural moisture content on the coarse discards indicate values in the range zero to greater than 14, with a mean of 9.

Tests on five samples of made ground indicate water soluble sulphates in the range 300 to 1400 mg/l SO<sub>4</sub> (mean of 808 mg/l) and pH values of 6.6 to 8.7 (mean of 7.5). These results are in addition to those obtained from the chemical analyses discussed in the preceding section of this report.

### 5.9.3. Glacial Till

Only two SPTs were taken in glacial till deposits and these indicate 'N' values of 11 and 22, suggesting stiff and very stiff conditions.

Natural moisture contents lie in the range 14 to 33% with a mean result of 25%.



Atterberg limit tests indicate liquid and plastic limits in the range 41 to 57% (average 48%) and 20 to 28% (average 22%) respectively. These results suggest intermediate to high plasticity.

Quick undrained triaxial compression tests indicate undrained shear strengths ( $c_u$ ) in the range 57 to 140 kPa, with an average of 99 kPa (stiff conditions).

Compaction tests indicate maximum dry densities in the range 1.55 to 1.70 Mg/m<sup>3</sup> (mean result of 1.66 Mg/m<sup>3</sup>) and optimum moisture contents ranging between 17 and 20% (mean result of 19%). These results suggest that the glacial till will generally be compacted slightly wet of optimum.

CBR tests at natural moisture content indicate results in the range 2.2 to 4.1% with a mean result of 3.4%.

MCV tests carried out at natural moisture content indicate values in the range 2.3 to 7, with a mean of 5.1.

## **6. CHEMICAL CONTAMINATION**

### **6.1. Preamble**

The results of chemical analyses undertaken on soil and groundwater samples taken from the exploratory holes are included in **Appendix F**, with summary tables included in **Appendix G**.

In total, one hundred and twenty six soil samples were selected for chemical analysis comprising one hundred and four from the made ground and twenty two from the underlying glacial till deposits. Selected samples of made ground were also subjected to leachate testing to assess solubility and hence mobility in groundwater. A total of five groundwater samples were taken from the standpipes.

For the purpose of the following assessment, the contamination results applicable to the five main areas of the site (Areas 1 to 5) are discussed separately. The site has therefore been assessed based on five averaging areas.

### **6.2. Soils Methodology**

#### **6.2.1. Preamble**

*Initial screening of results was undertaken by comparison with particular assessment criteria. The criteria adopted at this site are described below.*

For the purpose of this report, assessment criteria for residential after-use with private gardens were used in accordance with advice contained in CLR 10 (Ref. 9). These criteria are designed to assess the potential impacts of chemical contamination upon human health.

#### **6.2.2. CLEA Soil Guideline Values**

The CLEA model has been used by DEFRA and the Environment Agency (EA) to derive Soil Guideline Values (SGVs).

SGVs are a screening tool for use in the assessment of land affected by contamination and as such are designed to be protective of human health based on a range of after-use options including residential with and without plant up-take, allotment and public open spaces, and commercial/industrial. The SGVs are indicators to an assessor that soil contamination above this level might represent an unacceptable risk to the health of site users and that further investigation and/or remediation may be required.

To date, SGVs have only been issued for a small range of contaminants. In order to permit a preliminary screening assessment, the SGVs applicable to residential land-use with plant up-take (i.e. the most stringent type of after-use) were adopted.

### 6.2.3. SDA Soil Screening Values

In the absence of SGVs for many of the commonly occurring contaminants, SDA in association with Environmental Simulations International Ltd. (ESI) of Shrewsbury have derived their own set of generic soil screening values (GSSVs) for initial contaminated land assessment.

The algorithms provided in CLR 10 and its associated Briefing Notes (1 to 4) and *errata* have been coded by SDA/ESI into a human health risk assessment model. In the CLEA approach, probability density functions (PDFs) are required to allow probabilistic modelling of a number of input and output parameters. The Monte Carlo simulation package 'Crystal Ball' is therefore incorporated within a spreadsheet model to provide this facility.

The model has been developed and thoroughly tested using contaminants for which official SGVs and EA toxicological reports already exist. Specifications of the conceptual model options represented in the model, in terms of source, pathway and receptor are listed below.

#### Source

The source term host material can be specified as one of the standard soil types defined in CLEA Briefing Note 2, or alternatively a user-defined soil type based on site-specific data. The GSSVs provided in the report are based on the standard CLEA sandy soil with organic matter contents (SOMs) of 1%, 2.5% and 5%, and also on the standard CLEA clay soil with an SOM of 5%.

#### Pathway

The CLEA methodology gives four options for land-use. All four of these are incorporated into the model and can be modified if required to represent alternative land-uses. The standard land-uses were used to define the GSSVs provided in this report.

There are five potential contaminant pathways resulting from these land-uses, all of which are represented in the modelling tool. These are summarised as follows:

1. Ingestion of soil and household dust.
2. Ingestion of contaminated vegetables and of soil attached to vegetables.
3. Dermal contact with soil and household dust.
4. Inhalation of fugitive dust (indoor and outdoor).
5. Inhalation of vapours (indoor and outdoor).

#### Receptors

All of the age categories defined in the CLEA documentation are available. These include individual yearly classes between the ages of 0 and 16 years, followed by the 'working life' class spanning from 16 to 59 years, and the post work age class of 60 to 70 years. The defaults for the standard land-uses are 0 to 6 years for residential and allotments, and 16 to 59 for commercial/industrial.

#### **6.2.4. Range of GSSVs**

At present, the model has been used to derive GSSVs for boron, copper, zinc, cyanide, phenol (also available as CLEA model SGV), benzene, xylene, MTBE, PAH and TPH. Further GSSVs are planned for the future in response to specific project requirements.

#### **6.2.5. SDA GSSVs Model and Report**

A full copy of the model and the associated report in which the derivation of the GSSVs is fully explained is available from SDA.

### **6.3. Analysis of Soil Data**

A two tier assessment of the contaminants posing a risk to human health is recommended. The first level screening is intended to identify those contaminants that exhibit concentrations above the screening levels. The second, more detailed level, involves the following statistical analysis:

- The Mean Value Test: the sample mean for a small number of samples may be significantly less than the true (population) mean. Therefore, a no remedial action decision based on a small number of samples may not be adequately health protective. The approach used is to identify the 95% confidence limits of the measured mean and to compare the upper 95th percentile with the Soil Guideline Value.
- The Maximum Value Test: this is used to determine if the maximum value of a set of results is an 'outlier' or part of the anticipated range for the site as a whole.

The following screening assessment is based on all the available test results. The results applicable to the made ground and glacial till deposits are tabulated in **Appendix G** and discussed below for each of the five averaging areas.

#### **6.3.1. Made Ground**

##### **Area 1**

Seven samples were analysed. The first level screening assessment indicates elevated levels of arsenic (Table 1) in three samples. The mean value test for arsenic confirms a US<sub>95</sub> value of 23.9 mg/kg, thus the mean value test is failed.

With regard to inorganic and organic compounds (Tables 2, 3, 3A and 3B), the following was determined:

- Inorganic compounds - none of the samples were found to exceed the site screening values apart from one low pH result (3.5) taken from a sample in TP 1.
- Organic compounds – only one sample (from TP 2) exceeded the TEM site screening value of 500 mg/kg (Table 3). Further speciated tests on this sample for organic

compounds (based on 5% SOM) indicate no significant PAHs (Table 3A) and only slightly elevated TPHs in the range C<sub>10</sub>-C<sub>12</sub> (Table 3B). This sample is not considered to represent a contamination 'hotspot'.

## Area 2

Fifteen samples were analysed. The first level screening assessment indicates elevated levels of arsenic (Table 4) in twelve samples. The mean value test for arsenic confirms a US<sub>95</sub> value of 31.8 mg/kg, thus the mean value test is failed.

With regard to inorganic and organic compounds (Tables 5, 6, 6A and 6B), the following was determined:

- Inorganic compounds – two samples exceeded the site screening value of 10,000 mg/kg for total sulphate. The mean value test for sulphate confirms a US<sub>95</sub> of 13,665 mg/kg, thus the mean value test is failed. Three samples exceeded the site screening value of 5000 mg/kg for total sulphur. The mean value test for total sulphur confirms a US<sub>95</sub> of 10,512 mg/kg, thus the mean value test is failed. Five samples recorded pH values below the site screening value of 5.5.
- Organic compounds - six samples exceeded the TEM site screening value of 500 mg/kg (Table 6). Further speciated tests on these samples for organic compounds (based on 5% SOM) indicate slightly elevated PAHs (benzo(a)pyrene) in two samples from TP 5 (Table 6A), but no elevated TPHs (Table 6B). This sample is considered to represent a localised 'hotspot' of contamination.

## Area 3

Nineteen samples were analysed. The first level screening assessment indicates elevated levels of arsenic (Table 7) in twelve samples. The mean value test for arsenic confirms a US<sub>95</sub> value of 58.2 mg/kg, thus the mean value test is failed.

One sample (from TP 21) recorded elevated nickel. However, the mean value test confirms a US<sub>95</sub> value for nickel of 33.2 mg/kg, thus the mean value test is passed for nickel.

With regard to inorganic and organic compounds (Tables 8 and 9), the following was determined:

- Inorganic compounds – seven samples exceeded the site screening value of 10,000 mg/kg for total sulphate. The mean value test for total sulphate confirms a US<sub>95</sub> of 13,093 mg/kg, thus the mean value test is failed. Seven samples exceeded the site screening value of 5000 mg/kg for total sulphur. The mean value test for total sulphur confirms a US<sub>95</sub> of 10,211 mg/kg, thus the mean value test is failed. Eleven samples recorded pH values below the site screening value of 5.5.

- Organic compounds - none of the samples were found to exceed the TEM site screening value of 500 mg/kg (Table 9). No further organic analysis was therefore carried out.

#### Area 4

Twenty five samples were analysed. The first level screening assessment indicates elevated levels of arsenic (Table 10) in thirteen samples. The mean value test for arsenic confirms a US<sub>95</sub> value of 45.2 mg/kg, thus the mean value test is failed.

With regard to inorganic and organic compounds (Tables 11, 12, 12A and 12B), the following was determined:

- Inorganic compounds - six samples exceeded the site screening value of 10,000 mg/kg for total sulphate. The mean value test confirms a US<sub>95</sub> value of 9,838 mg/kg, thus the mean value test is passed. Seven samples exceeded the site screening value of 5000 mg/kg for total sulphur. The mean value test for total sulphur confirms a US<sub>95</sub> value of 7273 mg/kg, thus the mean value test is failed. Eight samples recorded pH values below the site screening value of 5.5.
- Organic compounds - two samples exceeded the TEM site screening value of 500 mg/kg (Table 12). Further speciated tests on these samples for organic compounds (based on 5% SOM) indicate elevated PAHs (benzo(a)pyrene and dibenz(ah)anthracene) in TP 36 and TP 45 (Table 12A), but no elevated TPHs (Table 12B). These samples are considered to represent localised contamination 'hotspots'.

#### Area 5

Thirty eight samples were analysed. The first level screening assessment indicates elevated levels of arsenic, copper, nickel and zinc (Table 13). The mean value test confirms US<sub>95</sub> values as tabulated below.

| Contaminant | Screening Value | Units | US <sub>95</sub> Result | Revised US <sub>95</sub> Result |
|-------------|-----------------|-------|-------------------------|---------------------------------|
| Arsenic     | 20 (SGV)        | mg/kg | 64.80                   | -                               |
| Copper      | 130 (GSSV)      | mg/kg | 78.67                   | 66.15                           |
| Nickel      | 50 (SGV)        | mg/kg | 30.86                   | -                               |
| Zinc        | 580 (GSSV)      | mg/kg | 212.71                  | 119.11                          |

The mean value test is failed for arsenic. Outliers or 'hotspots' of copper and zinc with concentrations significantly above the site screening values were identified at TP 50 and TP 58 respectively.

With regard to inorganic and organic compounds (Tables 14, 15, 15A and 15B), the following was determined:

- Inorganic compounds - twelve samples exceeded the site screening value of 10,000 mg/kg for total sulphate. The mean value test for total sulphate confirms a US<sub>95</sub> of 13,745 mg/kg, thus the test is failed. Sixteen samples exceeded the site screening

value of 5000 mg/kg for total sulphur. The mean value test for total sulphur confirms a  $US_{95}$  value of 10,364 mg/kg, thus the mean value test is failed. Six samples recorded pH values below the site screening value of 5.5.

- Organic compounds - fourteen samples exceeded the TEM site screening value of 500 mg/kg (Table 15). Further speciated tests on these samples for organic compounds (based on 5% SOM) indicate elevated levels of PAHs and TPHs. High concentrations of PAHs including naphthalene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and dibenz(ah)anthracene (Table 15A) were identified particularly in TP 72 and to a lesser extent in TP 77 and TP 79. Slightly elevated TPHs in the aromatic  $C_5$ - $C_7$  and aliphatic  $C_{10}$ - $C_{12}$  ranges were recorded in TP 66 and TP 47 respectively (Table 15B). On inspection, the speciated results from TPs 47, 72, 77 and 79 suggest that these samples represent localised 'hotspots' of contamination which may require further investigation.

### Combustibility

As mentioned in Section 4.5.3, samples of made ground with elevated LOI values (i.e. >25% by weight) were also subjected to CV tests. A summary of the results for each of the five designated areas is provided below:

- Area 1 – LOI values in the range 7.8 to 40.4% by weight with one sample out of seven exceeding 25% by weight. A CV test on the same sample recorded a result of 5235 kJ/kg.
- Area 2 – LOI values in the range 5.6 to 52.5% by weight with five samples out of fifteen exceeding 25% by weight. CV tests on all five samples indicate results in the range 1901 to 7277 kJ/kg.
- Area 3 – LOI values in the range 1 to 46.5% by weight with five samples out of nineteen exceeding 25% by weight. CV tests on all five samples indicate results in the range 5142 to 11,488 kJ/kg.
- Area 4 – LOI values in the range 3.5 to 65.7% by weight with two samples out of twenty five exceeding 25% by weight. CV tests on the two samples indicate results of 7875 and 13,389 kJ/kg.
- Area 5 – LOI values in the range 1 to 32.4% by weight with two samples out of thirty eight exceeding 25% by weight. CV tests on the two samples indicate results of 6160 and 7411 kJ/kg.

The LOI tests confirm that fifteen samples from the made ground deposits exceeded the site screening value of 25% by weight, thus confirming that the samples are potentially combustible due to the presence of residual coal.

Tests carried out on the same fifteen samples indicate CVs up to a maximum recorded value of 13,389 kJ/kg and generally above 5000 kJ/kg. It should be noted that the average coal content of colliery spoil tips in the UK is about 11% but with large regional variations.

### Asbestos

The trial pits found no evidence of asbestos in the ground and laboratory tests on seven samples of made ground found no evidence of any asbestos fibres either.

However, in view of the site history the possibility exists that asbestos may lie presently undetected at depth within the site. It is therefore advised that a 'watching brief' is adopted during the site works and if asbestos or suspected asbestos is found, appropriate advice should be sought. Adequate provision should be allowed for the time and cost involved in removing asbestos materials from the site, if present.

### Tests Applicable to Concrete Design

As mentioned in Section 4.5.3, total sulphur, water soluble sulphate and water soluble magnesium tests were carried out on samples with total sulphate levels above 5,000 mg/kg.

A summary of results applicable to the five designated areas is provided below:

- Area 1 – total sulphate levels in the range 362 to 6544 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 3957 mg/kg, 1750 mg/l and 35 mg/l respectively (one sample).
- Area 2 – total sulphate levels in the range 1021 to 45,992 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 2750 to 17,073 mg/kg, 933 to 3303 mg/l and 18 to 51 mg/l respectively.
- Area 3 – total sulphate levels in the range 1227 to 31,669 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 2231 to 13,050 mg/kg, 52 to 25,406 mg/l and 5.8 to 221 mg/l respectively.
- Area 4 – total sulphate levels in the range 519 to 31,948 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 3217 to 8671 mg/kg, 107 to 3192 mg/l and 16 to 321 mg/l respectively.
- Area 5 – total sulphate levels in the range 412 to 66,589 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 1969 to 23,120 mg/kg, 30 to 2229 mg/l and 1.5 to 87 mg/l respectively.

#### **6.3.2. Summary of Results – Made Ground**

A total of one hundred and four samples of made ground were analysed. Within each of the five averaging areas, elevated levels of arsenic were identified. The presence of significant arsenic contamination in the made ground deposits is confirmed by the results of the mean



value test which indicate  $US_{95}$  values ranging from 23.9 to 64.8 mg/kg compared to the SGV of 20 mg/kg.

The first level screening assessment also confirms elevated concentrations of nickel in Area 3 and copper, nickel and zinc in Area 5. The mean value test confirms no significant contamination of the made ground deposits as a whole in either of these areas. However, the test highlights the presence of localised 'hotspots' of copper and zinc in the vicinity of TPs 50 and 58 respectively in Area 5 which may require further investigation to assess the extent of the contamination.

Elevated concentrations of total sulphate were found in a number of samples from across the site although the mean value test confirms failures for Areas 2, 3 and 5 (not Area 1 and 4) with  $US_{95}$  values in the range 13,093 to 13,745 mg/kg compared to the site screening value of 10,000 mg/kg. High sulphate concentrations are to be expected where colliery spoil is present due to the oxidation of metallic sulphides commonly found in these deposits.

The analysis generally confirms acidic conditions in the made ground deposits with pH values as low as 2.7 but with a large number below 5.5. These results are fairly typical of colliery spoil deposits and are due to the gradual breakdown of pyrite by oxidation and weathering.

Further speciated tests on those samples exceeding the TEM site screening value of 500 mg/kg indicate no significant contamination of made ground deposits with respect to PAHs or TPHs anywhere on the site apart from localised contamination 'hotspots' in TP 5 in Area 2, TPs 36 and 45 in Area 4, and TPs 47, 72, 77 and 79 in Area 5 which may require further investigation. The main point of note is that no evidence of significant contamination has been found in association with the former coke ovens in Area 5.

Tests to determine LOI and CV confirm that some of the made ground deposits are potentially combustible. No asbestos fibres were identified in the made ground samples although this should not be taken as confirmation that asbestos is absent from the site and in particular within the made ground deposits and demolition arisings.

In view of the site history and the size of the site, it is possible that presently undiscovered areas of contamination may exist at the site. Allowance will need to be made for excavating and stockpiling any such materials for a further detailed assessment to be carried out with a view to determining the most suitable remediation and/or disposal options.

### 6.3.3. Glacial Till

#### Area 1

One sample was analysed. The first level screening assessment indicates no significant contamination with respect to metals, inorganic or organic compounds (Tables 16 to 18).

#### Area 2

Three samples were analysed. The first level screening assessment indicates no significant contamination with respect to metals or inorganic compounds (Tables 19 and 20).

One sample was found to exceed the TEM screening value of 500 mg/kg (Table 21). Further speciated tests on these samples for organic compounds (based on 1% SOM) indicate no significant levels of PAHs and no elevated levels of TPHs (Table 21A).

### Area 3

Five samples were analysed. The first level screening assessment indicates elevated levels of arsenic (Table 22). The mean value test confirms a  $US_{95}$  value of 36 mg/kg, thus the mean value test is failed.

No elevated levels of inorganic compounds were identified (Table 23). One sample was found to exceed the TEM screening value of 500 mg/kg (Table 24). Further speciated tests on this sample (from TP 26) for organic compounds (based on 5% SOM) indicate elevated benzo(a)pyrene representing a localised 'hotspot' (Table 24A), but no significant levels of TPHs (Table 24B). One sample recorded a low pH below the site screening value of 5.5.

### Area 4

Six samples were analysed. The first level screening assessment indicates no significant contamination with respect to metals, inorganic or organic compounds (Tables 25 to 27).

### Area 5

Seven samples were analysed. The first level screening assessment indicates no significant contamination with respect to metals, inorganic or organic compounds (Tables 28 to 30). Three samples recorded low pH values below the site screening value of 5.5.

### Tests Applicable to Concrete Design

As mentioned in Section 4.5.3, total sulphur, water soluble sulphate and water soluble magnesium tests were carried out on those samples with total sulphate levels exceeding 5000 mg/kg.

A summary of results applicable to the five designated areas is provided below:

- Area 1 – total sulphate levels in the range 230 mg/kg (one only).
- Area 2 – total sulphate levels in the range 346 to 4009 mg/kg.
- Area 3 – total sulphate levels in the range 1399 to 9961 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 2448 to 3239 mg/kg, 15 to 38 mg/l and 103 to 104 mg/l respectively.
- Area 4 – total sulphate levels in the range 453 to 7219 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 584 mg/kg, 455 mg/l and 34 mg/l respectively (one only).

- Area 5 – total sulphate levels in the range 375 to 6577 mg/kg. Total sulphur, water soluble sulphate and magnesium levels of 2217 mg/kg, 715 mg/l and 8.8 mg/l respectively (one only).

#### 6.3.4. Summary of Results – Glacial Till

A total of twenty two samples of glacial till were analysed. Elevated arsenic was identified in Area 3 although a 'hotspot' with high concentrations of benzo(a)pyrene was also found in a sample from TP 26 in the same area.

In general, the glacial till deposits do not contain any significantly elevated concentrations of organic contaminants (TPHs and PAHs). In addition, no contamination with respect to inorganic compounds was identified anywhere in the site.

It should be noted, however, that several samples from Areas 3 and 5 recorded low pH values, thus suggesting acidic conditions.

#### 6.4. Analysis of Leachates

A total of nine made ground samples taken from the worst areas of contamination across the site were submitted for leachate testing and the results compared with the UK Drinking Water Standards (Ref. 10). The results are summarised in Table 31 in **Appendix G**.

The results indicate elevated concentrations of sulphates and PAHs in just three and two samples respectively. However, elevated levels of TPHs were identified in all nine samples. These results suggest soluble and hence potentially mobile concentrations of TPHs, and to a lesser extent, sulphates and PAHs in the made ground deposits.

#### 6.5. Analysis of Groundwater

A total of five groundwater samples from the standpipes were analysed and the results compared with the UK Drinking Water Standards (Ref. 10). Groundwater was absent from the standpipes installed in Areas 1 and 2.

The results are summarised in Table 32 in **Appendix G**.

Elevated concentrations of cadmium, nickel, selenium, boron and sulphate and low pH were identified in the groundwater sample taken from BH 105 in Area 5. Elevated concentrations of sulphate were recorded in the groundwater across the entire site with elevated concentrations of nickel and TPH recorded in Areas 3/5 and 3/4 respectively.

#### 6.6. Conceptual Model

##### 6.6.1. Preamble

The following qualitative risk assessment was undertaken to determine the risk to both humans and the environmental receptors posed by the site. The assessment presents risks

based on the information contained in this report and draws on the information provided above.

#### 6.6.2. Concept

The risk assessment is a qualitative source-pathway-receptor assessment. It is proposed to demonstrate whether or not contamination is likely to come into contact with the receptors (people, structures, controlled waters, etc.), and whether that contact is likely to be potentially harmful.

Risk is defined as the combination of the consequences of a harmful effect and the probability of its occurrence. The existence of a pollutant linkage is heavily dependent on the site use as well as the environmental conditions.

The ground investigation has established that the north-east part of the site has been occupied in the past by a colliery and coke ovens with railway lines and sidings and associated structures. Much of the site was also covered in colliery spoil heaps and slurry lagoons. The site is undermined and parts have also been opencasted.

The former uses of the site would be considered to pose a high risk of causing significant ground contamination.

#### 6.6.3. Sources of Contamination

The ground investigation confirms the presence of elevated levels of arsenic in the made ground deposits across the entire site. Localised areas of copper and zinc were also recorded in Area 5.

Elevated concentrations of sulphates were identified in the made ground deposits in Areas 2, 3 and 5 and tests confirm generally acidic conditions over much of the site. Tests also indicate that the made ground deposits are potentially combustible.

Localised areas of hydrocarbon contamination were identified in Areas 2, 4 and 5. It should be noted that no evidence of significant contamination was found in the area occupied by the former coke ovens in Area 5.

The underlying glacial till deposits do not contain any significant contamination with the exception of elevated arsenic in Area 3 and a localised area of PAH contamination.

Tests on groundwater samples recovered from the standpipes indicate elevated concentrations of cadmium, nickel, selenium, boron and sulphate in Area 5 (which may be due in part to a low pH facilitating mobilisation of these elements). Otherwise, high concentrations of sulphate exist in the groundwater across most of the site and elevated levels of nickel and TPHs are present in Areas 3/5 and 3/4 respectively.

#### 6.6.4. Receptors

The receptor is the potential recipient of the pollution to which significant harm or deterioration in quality may be caused.

The receptors under consideration include the following:

- Human site users – site workers and the residents of the houses and apartments.
- Groundwater.
- Surface water courses.
- Vegetation – landscaping following re-development of the site.
- Adjacent land and properties.
- Buildings on the site – services and foundation concrete.

#### 6.6.5. Pathways

Migration pathways are the routes by which contamination may move towards the target. The pathways for exposure of human targets include dermal contact, ingestion and inhalation. Humans may also come into contact with gases which can build up in confined spaces within and below the houses.

The pathway for exposure of plants is by direct contact with the root system, or root up-take of phytotoxic contaminants dissolved in the soil or water.

The pathways for exposure of adjacent land and properties, groundwater or surface water are either from direct surface water run-off carrying contaminants in suspension or dissolved in the water, or by downward seepage of waters leaching contaminants in combination with lateral movement towards neighbouring properties via the groundwater.

The principal pathways by which targets might become exposed to contamination include:

- Direct human contact with contaminated soil or water.
- Surface run-off of contamination.
- Leaching of contamination into the groundwater and migration of groundwater.
- Gas migration into buildings or confined spaces.
- Plant uptake.
- Contaminated soil or groundwater coming into contact with buildings, foundations or buried structures.

#### 6.6.6. The Model

A representation of the conceptual model discussed in this report is presented as **Figure 11**.

## 7. DEVELOPMENT CONSTRAINTS

Based on the findings of the ground investigation and also the findings of the previous investigations described in Section 3.9, it is possible to identify the following development constraints which will need to be addressed by the design:

- The sloping nature of the site and the presence of several broad terraces which gradually fall to the south. It is likely that preparatory earthworks will be required to provide a development plateau for subsequent development.
- The presence of areas of surface hardstanding and remnant concrete and brick foundations and sub-structures. These obstructions are present mostly in Areas 2 and 5 and relate to the former use of the site as a colliery (see **Figures 2 and 6**).
- The presence of thin to moderately thick but occasionally thick deposits of made ground and principally colliery spoil comprising *coarse and fine colliery discards* across the entire site (see **Figure 4**).
- The presence of former mine entries including shafts and adits within the proposed development area (see **Figure 3**).
- The presence of shallow old mineworkings in the Kent's Thick seam which sub-crops across the site (see **Figure 3**).
- The presence of former opencast areas along the sub-crop of the Kent's Thick seam in Area 4 (see **Figure 3**). The report also refers to the possible presence of suspected opencast workings in Area 1 (see Section 5.3.2 and **Appendix A**) but no evidence for this has been founded in the ground investigation.
- The presence of presently undetected areas of contamination in the made ground deposits and especially within the previously developed areas of the site (i.e. principally Areas 2 and 5).
- The presence of elevated levels of heavy metals, sulphates and acidic conditions within the made ground deposits. The contamination assessment confirms only localised areas of hydrocarbon contamination and in general no significant levels of TPHs or PAHs were found in the made ground deposits, although it is possible that presently undiscovered areas of contamination might exist which may require remediation and/or disposal.
- The presence of residual coal in the colliery discards and the possibility of accidental ignition by surface fires.
- The presence of methane and carbon dioxide in the made ground deposits and the underlying Coal Measures strata. In addition, the site lies within a radon gas affected area and therefore basic radon gas protection measures are advised.

The following section on development considerations addresses all of the above issues and indicates areas where further investigations are required in order to progress the detailed design of the site.

## 8. DEVELOPMENT CONSIDERATIONS

### 8.1. Preamble

For the purpose of the following discussion, it is assumed that the entire site will be developed, although in view of its size it is likely that the works will be progressed in phases with Phase 1 comprising the development of the northern half of the site as shown on **Figure 12**.

In order to provide a development area suitable for the construction of houses it is likely that preparatory earthworks will be required comprising a fairly extensive cut-and-fill exercise to create a gradual fall from north to south across the site. The earthworks will therefore comprise the reduction in ground levels in the north of the site and the raising of ground levels in the south of the site using fill generated from the cuttings in the north. To minimise under-build, the post-earthworks grade across the site should not exceed about 1 in 35.

A typical cut-and-fill profile through the site is included as **Figure 13**. The section is taken through the approximate centre of the site from north to south. As can be seen, the ground levels within the northern part of the site will be reduced by up to 5m but typically between 2 and 4m. The lower lying southern part of the site, beyond chainage 200, will be raised by up to 8m of fill but more typically by 2 to 5m to give a post-earthworks grade of approximately 1 in 40 (i.e. less than 1 in 35). Reference to the cut-and-fill profiles provided by GSY confirms that the majority of the Phase 1 development area will be located in cut.

It is anticipated that the majority of the fill generated from the earthworks will comprise coarse colliery discards and in particular burnt and unburnt colliery spoil similar to that described in Section 5.3.1. In addition, variable amounts of secondary aggregate may be available from the re-processing of concrete and brick foundations, sub-structures and hardstanding, principally from Areas 2 and 5. Tests on samples of the coarse discards confirm that they should be suitable for re-use in earthworks subject to the compaction being undertaken in accordance with a detailed specification (to be prepared under separate cover) and provision included for supervision of the works and post-placement compliance testing and monitoring of the compacted soils.

The Phase 1 development will comprise the construction of a large number of houses with private gardens, drives and roads. The houses will be of conventional construction comprising two-storey detached, semi-detached and link properties, as well as three apartment blocks. It is anticipated that with the exception of the apartments the structural loads will be low.

### 8.2. Nature of Obstructions

As previously discussed, areas of surface hardstanding and remnant brick and concrete foundations are present mostly within Areas 2 and 5, but especially Area 5 where the majority of the former colliery buildings were located (see **Figure 2**).



The surface hardstanding should present few problems. The buried foundations and sub-structures are quite extensive and comprise reinforced concrete and substantial brick foundations which are likely to require the use of heavy plant and hydraulic breakers.

For the most part, the remnant foundations and sub-structures are present to 4m bgl. However, the possibility exists that some obstructions could extend to depths in excess of 4m and where present these should be 'chased-out' in the earthworks.

Buried foundations and sub-structures will give rise to 'hard spots' below the site which may prejudice the performance of foundations constructed above them.

The approximate location of the main colliery buildings and coke ovens based on information taken from the historical maps (see Section 3.7.2) is shown on **Figure 6**. Based on this information, it is possible to plot the area within which the majority of buried foundations and sub-structures are likely to be present. This area is indicated on **Figure 14**.

The area shown on **Figure 14** is also the area within which the greatest potential for chemical contamination exists. The earthworks will also permit a further re-assessment of the ground conditions and assist in identifying any presently undiscovered areas of contamination for subsequent treatment.

### 8.3. Treatment of Obstructions and Supervision

It is recommended that all obstructions are removed and re-processed as secondary aggregate for re-use in the works. All obstructions should be removed in order to allow maximum flexibility in the plot layout and to generate as much good quality secondary aggregate as possible.

Where obstructions are removed from below the proposed development level, it is recommended that the excavations are reinstated with engineered fill as previously advised in Section 8.1.

The removal of the remnant foundations and sub-structures should be supervised on a full-time basis by a qualified engineer or environmental scientist. The individual appointed to carry out this work will also be responsible for identifying and making sure that any contaminated or suspected contaminated soils and/or groundwater are removed and stored on site for subsequent assessment and treatment in accordance with a detailed Remediation Method Statement (RMS).

### 8.4. Shallow Mineworkings and Mine Entries

#### 8.4.1. Preamble

The site is underlain by bedrock of the Middle Coal Measures. The Kent's Thick seam sub-crops through the site as shown on **Figure 3** and it is this seam which has been worked at shallow depth below the site and within influencing distance of the surface.

The extent of recorded mineworkings at the site is also shown on **Figure 3**. The records indicate the following:

- Two adits which are thought to have been driven to intersect the Kent's Thick seam within the central part of the site.
- Three mine shafts located within the central part of the site and adjacent to the northern and western site boundaries.
- The presence of shallow underground mineworkings in the Kent's Thick seam from its sub-crop and extending beneath most of the northern half of the site.
- The presence of an area of former opencast workings along the sub-crop of the Kent's Thick seam within Area 4 (area shaded blue on **Figure 3**).

#### **8.4.2. Mineworkings in Kent's Thick Seam**

It is thought likely that the workings in the Kent's Thick seam were carried out by bord and pillar. Access to the coal was by shafts (i.e. the three shafts referenced above) and adits from the sub-crop with associated roadways. Unworked pillars of coal were left in-situ to support the roof of the workings, thus enabling large quantities of coal to be extracted through single or pairs of shafts. Initially, the pillars were haphazard in size and arrangement and the rooms were generally quite small. However, more systematic methods were developed in the mid to late 1800s with intersecting roadways driven in the seam, forming pillars of a more uniform size.

After the initial extraction, partial or total robbing of pillars often took place as is thought possible in the north-west corner of the site where the records indicate an extensive area of goaf. Such extraction was essentially a retreat operation (i.e. it commenced at the extremity of the workings and proceeded towards the entrance). Initially there is very little subsidence but it eventually occurs if pillars settle into the mine floor, through collapse from overload after weathering, or if deliberately removed. However, at shallow depths crushing of coal pillars is rare. The resulting ground settlements are likely to be erratic and independent of time, with some 70% of all old workings liable to further collapse.

Shallow mineworkings have the potential to cause building and development problems because the size and condition of the workings are very difficult to establish. Where the depth is such that surface subsidence is considered likely – as is the case at this site – measures are required to mitigate the risk.

#### **8.4.3. Surface Stability in Undermined Areas**

Shallow mineworkings (less than 50m bgl) can have severe implications on surface stability. The main design concern is failure of the strata forming the roof of the workings with subsequent upward migration of voids.

Roof collapse is the deformation of the strata above a working void, usually along discontinuities (bedding planes and joints). This can manifest itself in various forms depending on the orientation and frequency of the discontinuities. The roof collapse process occurs progressively until the material collapsing into the workings (which occupies a greater volume than in its undisturbed state) fills the void thereby arresting the collapse mechanism. Alternatively, collapse may be arrested before the void is filled when a strata of high tensile strength effectively spans the migrating collapse front (e.g. competent sandstone horizon). For shallow workings, voids may migrate and reach the surface before the workings have been totally filled. This type of collapse may occur many years after the original mining.

The conventional approach to the problem is to identify a zone of possible subsidence, based on a safe depth below which collapse of workings would not be expected to affect the ground surface. It should be noted that where workable seams underlie a site, some risk of ground subsidence is present. The definition of a safe depth is based on accumulated experience and case histories which suggest that collapse of workings below this depth do not generally affect the ground surface.

#### 8.4.4. Void Migration

Experience has shown that the maximum height of collapse that can occur above a seam in typical Coal Measures strata is about 8 to 10 times the seam thickness or extraction height.

A detailed discussion regarding the mechanisms of roof collapse can be found in CIRIA Special Publication No. 32 (Ref. 11). The guidance contained in this publication has been adopted by the National House Building Council (NHBC).

In accordance with the above publication, the NHBC recommend that construction should only proceed above shallow, untreated workings where there is a minimum rock cover of 10:1. Where the cover is partially constituted by competent clay materials (which is not the case at this site), it is acceptable to assume an effective rock cover of 50% of the total thickness. The Kent's Thick seam attains an average thickness of about 1m.

Based on the above, the area considered most at risk from collapse of mineworkings in the Kent's Thick seam is shown on **Figure 3**.

#### 8.4.5. Remedial Options

Various methods are in common use to stabilise shallow mineworkings and a complete description can be found in the CIRIA publication referred to previously. The two most common methods are:

- Bulk excavation of the overlying strata and coal seam followed by reinstatement of the ground in a controlled earthworks operation.
- Drilling and grouting of the mineworkings and overlying strata to fill any voids and to strengthen the ground.

The possibility of carrying out a small opencast operation to remove the Kent's Thick seam in advance of foundation construction has been discussed with GYS but rejected due to the time required to obtain planning approval and to carry out the works.

Drilling and grouting is considered technically and economically feasible and is, for the reasons stated above, the preferred option at this site. At this stage, it is recommended that treatment is extended to cover both the plots and the estate roads.

The grouting should be undertaken on a regular grid extending a distance from the building line and road edge equivalent to  $\tan 15^\circ$  times the depth of workings below ground level. Voids within the stabilisation zones should be filled with suitable cement-based grout injected through boreholes drilled to intercept the workings within the seam. A curtain wall may be required around the perimeter of the treatment zone but the largely collapsed state of the workings suggests grout migration at the edges of the zone should be minimal.

The grouting should take place through primary holes drilled on a staggered 3m wide grid across the entire treatment area. Secondary infill holes may be required in areas of high grout take to give an effective borehole spacing of 1.5m. The area of the treatment zone is estimated in the region of 43,000 m<sup>2</sup> or 4.3 ha.

It is recommended that the grouting of the workings in the Kent's Thick seam is carried out after the preparatory earthworks discussed above.

#### **8.4.6. Treatment of Adits and Shafts**

A number of methods are available to treat adits and shafts as follows:

- Cover – provide a fence, wall or building designed to prevent unauthorised access directly to the adit.
- Cap – provide a steel or concrete platform placed over the shaft at rockhead or on competent glacial till.
- Plug – provide a substantial block of concrete in a shaft keyed into the surrounding rock and capable of supporting the weight of any ground above it and a superimposed load.
- Grout – grout the inside of the shaft and adit to fill any voids combined with a cap and/or plug as discussed above.

With respect to this site, the following are advised:

- Shafts – locate the precise position, depth and condition of the shafts by trenching and/or probe drilling at close centres, the latter at the same time as the grouting of the workings in the Kent's Thick seam. It is possible that the shafts will be found during the initial preparatory earthworks and if so this will obviously negate the need for investigatory probe drilling and trenching. With respect to treatment, it is

recommended that the shafts are treated by drilling and grouting followed by the placement of a reinforced concrete cap at rockhead or if too deep, on competent glacial till. The cap should be at least twice the diameter of the shaft (or twice the diagonal of a square shaft) and it should be designed for the overburden pressure plus a superimposed load of 33 kPa. The concrete comprising the cap should be grade C30 and a minimum of 450mm thick with reinforcement bars of not less than 40mm diameter with not less than 100mm cover.

- Adits – locate the precise position of the adit and establish the nature of any infilling by probe drilling along the line of the adit. This can be undertaken at the same time as the grouting of the workings in the Kent's Thick seam. It should be noted that there is no evidence of the adit entrances at the surface but they may be found during the preparatory earthworks discussed above. Once located, partial excavation of the adit may be required to determine whether it was backfilled or sealed satisfactorily at the entrance. It is recommended that the adits are treated by drilling and grouting to a point where the rock cover above the adit is at least ten times the height of the adit. In addition, the entrance of the adit should be sealed with a concrete or brick wall at least 300mm in thickness.

#### 8.4.7. Sterile Zone around Mine Entries

The NHBC do not permit development above a shaft or adit even if it has been adequately treated. This follows the advice given in CIRIA Special Publication No. 32 and will have obvious implications with respect to the proposed site layout.

With respect to shafts, the normal requirement is to allow a safety zone around the shaft, the dimensions of which should be subtended by a line drawn at 45 degrees to the surface (i.e. post earthworks surface) from where the sides of the shaft intersect rockhead.

In the case of adits, it is advised that no building should be located directly above a treated adit.

#### 8.5. Opencast Workings

An area of opencast workings in the Kent's Thick seam is located within the eastern half of the site as shown on **Figure 3**.

The workings were very shallow and confined mostly to the sub-crop of the seam and a short distance to the north. The exploratory holes confirm made ground between 2 and 4m thick within the former excavation area.

In view of the age of the workings (undertaken in 1974), the shallow depth of the excavation and hence of the backfill materials in the former void, no significant geotechnical problems are envisaged and the area can be treated in a similar manner to the other non-opencasted areas of the site.

Reference to earthworks profiles provided by GSY confirms that this part of the site is located outside the proposed Phase 1 development area and will be subject to the placement of between 2 and 4m of fill, thus effectively pre-loading the ground in advance of the commencement of the Phase 2 works. Self weight settlement of the opencast backfill should now be complete and inundation settlement in the long term due to rising groundwater levels is unlikely.

## **8.6. Contamination Issues**

### **8.6.1. Preamble**

The principal risk at this site relates to contamination in the made ground deposits. For the purpose of the following discussion the glacial till deposits are regarded as uncontaminated.

As previously discussed, in view of the site history and the size of the site, it is possible that presently undiscovered areas of contamination may exist at the site. The likelihood is that any such contamination will be discovered during the preparatory earthworks as previously discussed. Allowance should therefore be made for the time and cost involved in separately excavating and stockpiling this material for a detailed assessment to be carried out with a view to determining appropriate remediation and/or disposal options.

The contamination assessment has confirmed the presence of widespread elevated levels of arsenic and sulphates in the made ground deposits (in both the fine and coarse discards). In addition, isolated occurrences of elevated nickel, copper and zinc were identified in some of the samples. Acidic conditions prevail in the made ground deposits due principally to the breakdown of pyrite by oxidation and weathering. No significant levels of TPHs and PAHs were identified in the made ground deposits apart from several isolated occurrences as previously discussed in Section 6.3.2.

### **8.6.2. Combustibility of Made Ground**

Visual assessment of the colliery discards confirms the presence of quite appreciable amounts of residual coal and lesser amounts of other carbonaceous materials. The results of LOI and CV tests on selected samples from each of the five averaging areas are discussed in Section 6.3.1.

Samples with LOI values above 25% by weight are generally considered to be combustible. For the purpose of this report, LOI was used as a screening test to identify those samples for further analysis to determine their CV. The CV test is the test most commonly used to assess combustibility and is the preferred method of the NHBC.

It is generally agreed that samples with a CV of 10 MJ/kg or above are combustible, whilst samples with a CV of 2 MJ/kg or less are unlikely to burn. Samples with a CV of 7 MJ/kg or above are considered to be at risk from smouldering, although under laboratory conditions smouldering can occur in samples with a CV of less than 7 MJ/kg.

The results presented in Section 6.3.1 indicate that the majority of samples subjected to CV testing recorded results above 2 MJ/kg with a significant number also above 7 MJ/kg. The

highest CVs were recorded in samples from Areas 3 and 4 with maximum CVs of 11,488 and 13,389 MJ/kg respectively. In the light of these results, the made ground deposits are considered potentially combustible and therefore it is advised that precautions are incorporated into the design to protect the development from accidental ignition of the made ground deposits.

#### **8.6.3. Remedial Measures**

The principal risk of accidental ignition of the colliery discards exists within the proposed gardens of the houses and within any POS areas. Where there is a potential risk of combustion, the NHBC requirement is for a 1m thick soil cap in the gardens to prevent ignition by an intense surface fire (i.e. bonfire) and to avoid combustible material becoming exposed during future activities on the site.

The 1m thick soil cap in the gardens should also provide adequate protection against the elevated levels of heavy metals and sulphates identified in the made ground deposits as discussed above. The materials used to form the cap should be certified as suitable for inclusion in domestic gardens and a regular check made on the as-placed thickness.

The above recommendation for a 1m thick soil cap may need to be re-assessed in the light of findings following the preparatory earthworks as discussed above.

The contamination assessment confirms leachable concentrations of TPHs and, to a lesser extent, sulphates and PAHs in the made ground deposits. These results are not considered significant in view of the nature of the site and the fact that the underlying Coal Measures bedrock is a minor aquifer. The development of the site will adequately deal with surface run-off, the majority of which presently drains to the south-east corner of the site and ultimately into the River Dearne.

Analysis of groundwater samples confirms elevated levels of several contaminants in the sample taken from BH 105 in Area 5 but generally lower levels of contamination in the other samples taken from elsewhere within the site. Although the contamination levels in the groundwater are generally above those considered acceptable for drinking water, the levels are mostly typical of former colliery sites and groundwater quality generally within the Coal Measures strata.

#### **8.6.4. Gas Emissions**

The results of the gas monitoring carried out to date are provided in Section 5.8. The readings suggest negligible levels of methane up to 0.1% by volume and low to moderate levels of carbon dioxide up to 11.5% by volume with negligible flows.

At present, there are insufficient gas readings to carry out a detailed gas risk assessment, the findings of which will determine the scope of gas protection measures required at the site. However, based on the readings listed above, and referring to the design guidance contained in CIRIA Report C665 (Ref. 12), it is likely that gas protection measures will be required at the site including a gas resistant membrane in the floor slab construction. The precise nature of the protection measures will depend on the foundation design and in this regard the advice

contained in Building Research Establishment (BRE) Report 414 (Ref. 13) should be adhered to.

#### **8.6.5. Radon Gas Protection**

Basic radon gas protection measures are required at the site. It is recommended that the advice contained in BRE Report 211 (Ref. 14) is followed with respect to the design of the radon gas protection measures.

In its simplest form, basic radon gas protection measures comprise a well installed damp-proof membrane modified and extended to form a radon-proof barrier across the floor slab.

In view of the need to provide protection against methane and in particular carbon dioxide, it is recommended that the barrier in the floor slab should be designed to deal with radon, methane and carbon dioxide.

### **8.7. Foundation Design and Construction**

#### **8.7.1. Preamble**

For the purpose of the following discussion, the site has been sub-divided into two development phases, referred to as Phase 1 and Phase 2. Phase 1 occupies the northern half of the site as shown on **Figure 12** and includes Areas 1, 2 and 5 as described previously.

Reference to the scheme cross-sections provided by GSY (not presented here) indicates that Phase 1 is located predominantly in cut (typically between 2 and 4m), but with a small area of fill placement (typically between 1 and 2m) indicated towards the western end of the Phase 1 development area within what is presently Area 2.

The Phase 2 development area occupies the lower lying southern half of the site and is located predominantly in areas where the ground levels will be raised by the placement of fill from the adjacent areas of cut in Phase 1. The thickness of fill required to achieve the proposed development level will typically vary between 2 and 5m but with localised areas where the fill may approach 8m thick.

Superimposing the exploratory holes onto selected scheme cross-sections confirms that the vast majority of fill available from the cut sections in Phase 1 will comprise made ground and in particular the burnt and unburnt coarse discards described in Section 5.3. However, glacial till and possibly bedrock may be encountered in some locations.

#### **8.7.2. Phase 1 Development Area – Options**

The post-earthworks ground conditions within the Phase 1 area will comprise made ground up to 4 to 5m thick but typically 2 to 4m thick, overlying competent glacial till and/or bedrock. However, towards the northern site boundary, it is possible that the made ground may be removed entirely, thus exposing the in-situ glacial till and/or bedrock at the proposed development level.



At this stage it is difficult to predict with accuracy the nature of the ground conditions below the proposed development level. It is therefore advised that following completion of the preparatory earthworks a supplementary ground investigation is undertaken comprising shallow boreholes and possibly some trial pits to establish the post-earthworks ground profile.

Pending the findings of these further investigations and where the made ground is absent or less than say 2m thick, consideration could be given to shallow reinforced strip footings or possibly trench fill footings founded in the glacial till deposits or bedrock. An allowable bearing capacity in the region of 100 kPa is recommended for the glacial till deposits. A much higher figure will apply to the weathered Coal Measures bedrock in the region of 250 kPa. The area over which strip or trench fill footings may be feasible is shown on **Figure 15**.

Where the made ground is in excess of 2m thick (mostly within the central and southern part of the Phase 1 area), consideration could be given to the following:

- Edge beam raft foundations founded at shallow depth in the made ground deposits. Tests confirm that the predominant coarse discards are mostly medium dense with the majority of SPT 'N' values in the range 10 to 30.
- Vibro-replacement stone columns comprising non-carbonate stone. Full depth treatment of the made ground deposits is recommended. Following treatment, consideration could be given to reinforced strip footings founded centrally on the columns at shallow depth (i.e. 600mm bgl). Obstructions in the made ground may require pre-boring of the stone column holes or removal by an excavator in advance of the vibroflot.
- Short driven steel tube piles founded in bedrock and therefore acting chiefly in end-bearing. Care will be required in the vicinity of the sub-crop of the Kent's Thick seam to ensure that the piles are terminated in competent strata below the level of the seam.

In the event that the post-earthworks investigations confirm variable SPT 'N' values in the made ground deposits, it may be necessary to consider carrying out ground improvement in advance of raft construction to unify the density of the made ground and hence make it less susceptible to settlement and in particular differential settlement. Dynamic compaction is the preferred method and in particular the rapid impact compactor (RIC) which is considered well suited to the predominantly granular made ground deposits. Noise and vibrations can be a problem but these are not considered major issues at this site.

### 8.7.3. Preferred Option for Phase 1

Pending the findings of the further investigations recommended above, it is likely that a composite foundation solution will be required for the Phase 1 development area comprising shallow reinforced strip footings or trench fill in the northern part of the site where the made ground is either absent or up to 2m thick. Elsewhere, consideration could be given to vibro-replacement stone columns, piles or raft foundations but with the possibility of ground improvement in advance of raft construction if the density of the made ground is found to be variable.

In the case of the small area of fill placement indicated towards the western end of the Phase 1 area, it is proposed that raft foundations are used in this part of the site as required within the majority of the adjacent Phase 2 area (see below).

#### **8.7.4. Phase 2 Development Area – Options**

The Phase 2 development area comprises the majority of the southern half of the site and it is assumed for the purpose of this report that construction within this part of the site will proceed some several months or even years after the commencement of the adjoining Phase 1 works.

As already discussed, in order to achieve the desired development level within the Phase 2 area it will be necessary to raise the ground level by up to 8m but more typically 2 to 4m. The fill for this operation will be obtained from the cuttings in the Phase 1 area and it is assumed for the purpose of the following discussion that the fill will be properly placed and compacted as advised in Section 8.1.

*Prior to fill placement care should be taken to drain any areas of waterlogged ground and measures put in place to divert any watercourses around the works including any existing drains. Also, it will be necessary to provide an adequate 'key-in' where the cut-and-fill areas abut each other. Further details should be provided in the earthworks specification.*

The raising of the ground levels in the Phase 2 area will effectively result in preloading of the ground in advance of foundation construction which should prove beneficial in improving the density and hence load bearing capacity of the made ground deposits. The exploratory holes confirm the presence of areas of very loose and loose fine discards within the former lagoon areas (see **Figure 6**). These areas should respond well to preloading even under the fairly modest loads imposed by 2 to 5m of fill (i.e. 40 to 100kPa). Settlement within the predominantly granular made ground deposits should be largely immediate in nature but long-term creep settlement is likely especially in areas underlain by fine discard.

With respect to foundations, it should be possible to support the houses on raft foundations placed at shallow depth in the compacted fill. The rafts should be sufficiently stiff to deal with any long term settlements in the compacted fill and underlying made ground deposits but these are not anticipated to be large.

The scheme cross-sections provided by GSY indicate that at the southernmost margins of the Phase 2 area the fill may be less than 2m thick, gradually thinning out towards the site boundary. Within these areas, which are not anticipated to be extensive, it may be necessary to adopt a different foundation solution especially if underlain by an appreciable thickness of very loose and loose fine discard. Further investigations are advised in these areas following completion of the preparatory earthworks.

The cut-and-fill transition between Phase 1 and 2 should be accurately plotted following completion of the preparatory earthworks. The scheme layout should be designed such that no foundations straddle the transition although it should be possible to locate roads and gardens above it.

#### **8.7.5. Preferred Option for Phase 2**

On the assumption that the fill is adequately placed and compacted, it should be possible to provide raft foundations at shallow depth in the fill. A change in foundation design may be required where the fill gradually thins out towards the southern site boundary.

#### **8.8. Earthworks**

No major problems are anticipated with earthworks in the predominant made ground deposits.

The majority of excavations should be possible with conventional hydraulic plant although heavy duty breakers may be required to remove remnant brick and concrete foundations and sub-structures, some of which may be heavily reinforced. Allowance should be made for the time and cost involved in carrying out such operations.

The majority of excavations should be dry. However, perched water tables in the made ground and underlying glacial till deposits cannot be ruled out and provision should be allowed for dewatering.

The made ground and underlying glacial till deposits should stand unsupported in vertical excavations for limited periods. However, in the event that it is required to leave excavations open for a prolonged period of time, consideration should be given to support or cutting back the excavations to provide a stable side slope.

Where it is proposed to provide permanent slopes in the made ground and glacial till deposits (i.e. at the site margins), it is recommended that the slopes are formed with batters of 1 in 2.5 (22 degrees) or flatter.

#### **8.9. Pavement Design**

##### **8.9.1. Preamble**

The pavement design will be dependant on the sub-grade conditions. The pavement design requirements for both phases of the development (i.e. Phase 1 and 2) are discussed separately below.

##### **8.9.2. Phase 1**

The sub-grade across the majority of the Phase 1 development area will comprise made ground but with the possibility of glacial till or bedrock in some areas (i.e. close to the northern site boundary).

Tests on the predominant coarse discards present in the Phase 1 area indicate a high mean CBR value of 22%. However, soft spots are likely as suggested by a number of the CBR test results. Adequate provision should therefore be allowed for the replacement of soft spots in the formation.

Tests on the glacial till deposits indicate, as expected, much lower CBR values with a mean value of 3.4%. It will therefore be necessary in areas where the sub-grade comprises glacial till to provide a capping layer.

### 8.9.3. Phase 2

The majority of the roads within the Phase 2 development area will be located on engineered fill. On the assumption that the materials are properly placed and compacted, high CBR values similar to those for the coarse discards in the Phase 1 should apply.

### 8.10. Concrete Design

The chemical tests results indicate the following characteristic values for the made ground deposits:

- Water soluble sulphate – 2,468 mg/litre
- Water soluble magnesium – 134 mg/litre
- Total potential sulphate – 4.1%
- pH – 3.9

Referring to the design guidance contained in BRE Special Digest No. 1 (Ref. 15), the following Design Sulphate Class and ACEC rating apply for a brownfield site with static groundwater conditions:

- Design Sulphate Class – DS-5
- ACEC rating – AC-5

Referring to Table D1 in the above publication, a concrete grade of DC-4 is indicated but with the requirement for an additional protection measure (APM) consisting of a coating or water resistant membrane, the requirement for which is similar to those for coatings.

With respect to membranes, it is recommended that a 1200 gauge polythene sheet is used to line excavations for strip or trench fill footings or to line a site prior to casting a raft foundation.

### 8.11. Existing Drainage

An underground sewer crosses the southern part of the site (see Section 3.2.4). Investigations should be undertaken to determine the condition of the sewer and checks made on whether it is capable of withstanding the loads from the fill which will be placed above it. The possibility exists that the sewer may need to be diverted around the earthworks or re-located to another part of the site.

### 8.12. Further Investigations and Monitoring

The following is a summary of the further investigations required to finalise the design of the scheme:

- Investigations to locate and determine the condition of the mine adits and shafts by trenching and/or probe drilling, the latter at the same time as the grouting of the workings in the Kent's Thick seam. It is possible that the adits and/or shafts will be discovered during the preparatory earthworks stage.
- Investigations to determine the post-earthworks ground profile in the Phase 1 development area in order to establish the most cost effective foundation solution. In addition, investigations are recommended along the southern site boundary of the Phase 2 development area where the engineered fill gradually thins out towards the site boundary.
- Investigation of the 'hotspot' areas described in Section 6 following completion of the preparatory earthworks.
- The installation of surface monitoring stations within the Phase 2 development area to check on the post-earthworks settlements prior to foundation construction.

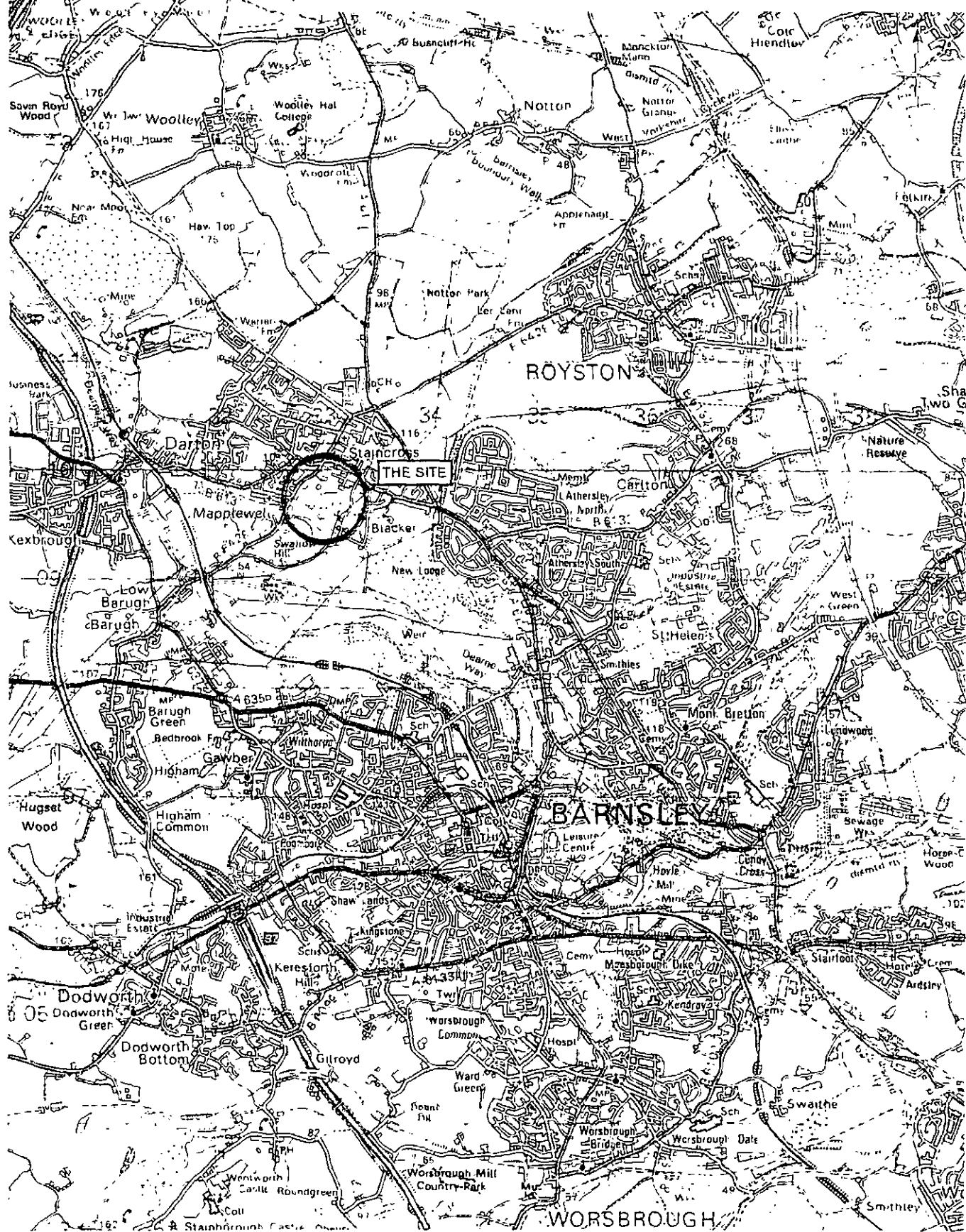
In addition to the above, there may be a need to install additional standpipes at the site to replace the ones that will inevitably be lost during the preparatory earthworks.

### 8.13. REFERENCES

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8. Richards, Palmer and Barratt (1993), 'The Reclamation of Former Coal Mines and Steel Works'. Elsevier Science Publishers.
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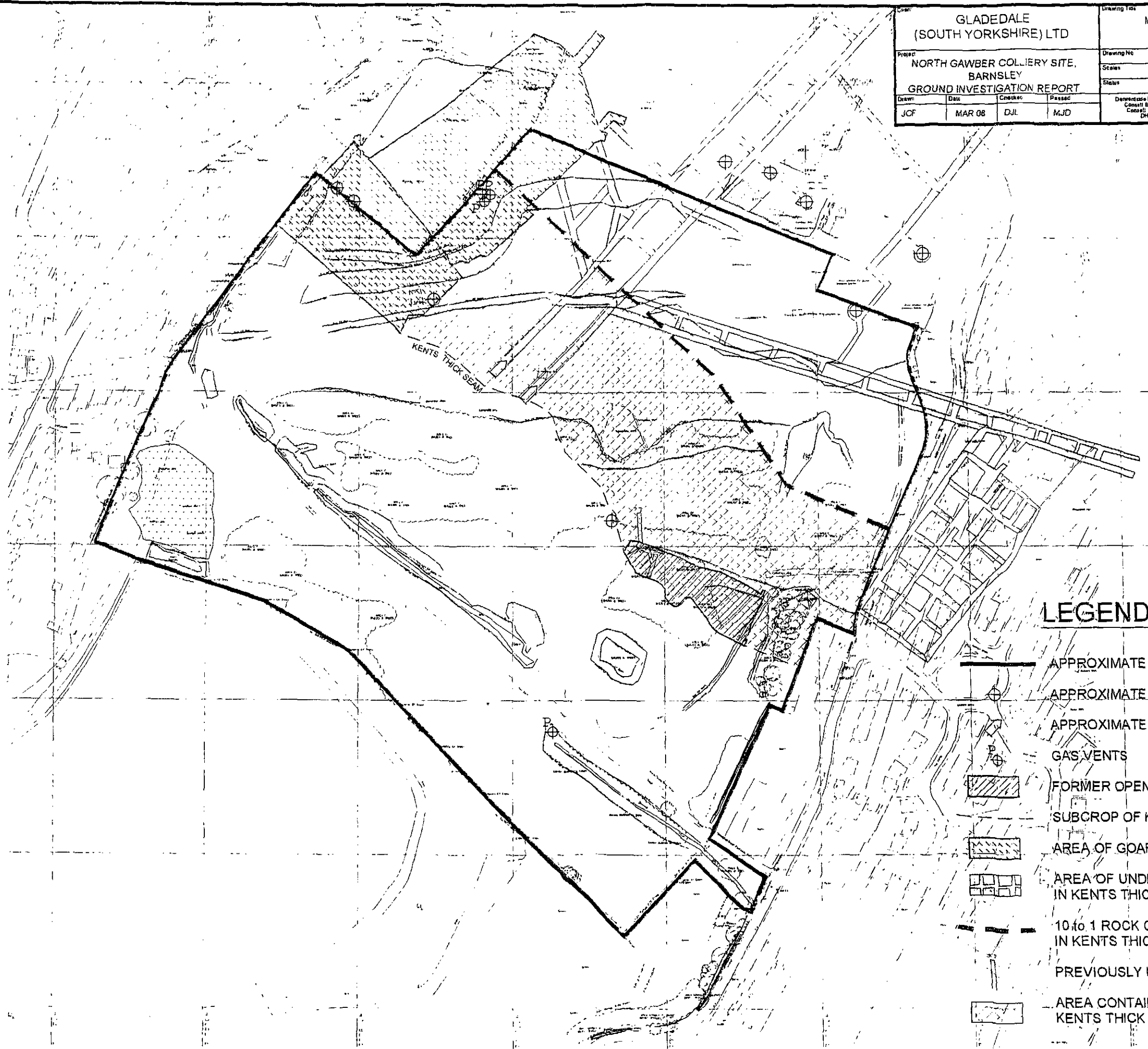
## FIGURES

|                                                                                          |             |                |               |                                                                                  |  |
|------------------------------------------------------------------------------------------|-------------|----------------|---------------|----------------------------------------------------------------------------------|--|
| <b>GLADEDALE<br/>(SOUTH YORKSHIRE) LTD</b>                                               |             |                |               | <b>REGIONAL LOCATION PLAN<br/>FIGURE 1</b>                                       |  |
| <b>Project</b><br>NORTH GAWBER COLLIERY SITE,<br>BARNSELY<br>GROUND INVESTIGATION REPORT |             |                |               | <b>Drawing No</b><br>SDA/07053/01                                                |  |
|                                                                                          |             |                |               | <b>Scale</b><br>1 50,000                                                         |  |
|                                                                                          |             |                |               | <b>Status</b><br>FINAL                                                           |  |
| <b>Drawn</b>                                                                             | <b>Date</b> | <b>Checked</b> | <b>Issued</b> | Drawn: SDA Business Centre<br>Checked: G. Latham<br>Date: 12/07                  |  |
| JCF                                                                                      | MAR 08      | DJ             | MJD           | Geotechnical and<br>Environmental Consultants<br><b>SCOTT DOHERTY ASSOCIATES</b> |  |

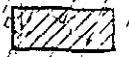
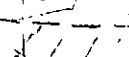
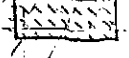
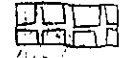
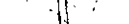
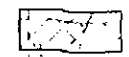




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| Client: GLADEDALE (SOUTH YORKSHIRE) LTD                                          |              |              |             | Drawing Title: MINEWORKINGS PLAN<br>FIGURE 3                                          |  |
| Project: NORTH GAWBER COLLIERY SITE,<br>BARNSELEY<br>GROUND INVESTIGATION REPORT |              |              |             | Drawing No: SDA/07053/03                                                              |  |
|                                                                                  |              |              |             | Scale: 1 : 2500                                                                       |  |
|                                                                                  |              |              |             | Status: FINAL                                                                         |  |
| Drawn: JCF                                                                       | Date: MAR 08 | Checked: DJL | Passed: MJD | Derwentdale Business Centre<br>Consent Business Park<br>Cesalt, Co. Durham<br>DH8 6EP |  |
|                                                                                  |              |              |             | Geotechnical and<br>Environmental Consultants:<br>SCOTT DOHERTY ASSOCIATES            |  |



# **LEGEND**

-  APPROXIMATE SITE BOUNDARY
-  APPROXIMATE POSITION OF SHAFT
-  APPROXIMATE POSITION OF ADIT
-  GAS VENTS
-  FORMER OPENCAST AREA
-  SUBCROP OF KENTS THICK SEAM
-  AREA OF GOAF IN KENTS THICK SEAM
-  AREA OF UNDERGROUND WORKINGS IN KENTS THICK SEAM
-  10:1 ROCK COVER RATIO LINE IN KENTS THICK SEAM
-  PREVIOUSLY UNRECORDED WORKINGS
-  AREA CONTAINED BETWEEN SUB-CROP OF KENTS THICK SEAM AND 10:1 RATIO LINE

|                                                                                             |                       |                       |                      |                                                                                          |  |
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| Client<br><b>GLADEDALE<br/>(SOUTH YORKSHIRE) LTD.</b>                                       |                       |                       |                      | Drawing Title<br><b>THICKNESS OF<br/>MADE GROUND DEPOSITS<br/>FIGURE 4</b>               |  |
| Project<br><b>NORTH GAWBER COLLIERY SITE,<br/>BARNSELEY<br/>GROUND INVESTIGATION REPORT</b> |                       |                       |                      | Drawing No<br><b>SDA/07053/04</b>                                                        |  |
|                                                                                             |                       |                       |                      | Scale<br><b>1 : 2500</b>                                                                 |  |
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| Drawn<br><b>JCF</b>                                                                         | Date<br><b>MAR 08</b> | Checked<br><b>DJL</b> | Passed<br><b>MJD</b> | Drawn by Business Centre<br>Consult Business Park<br>Consult, Le. Darnham<br>Dn. 887     |  |
|                                                                                             |                       |                       |                      | Geotechnical and<br>Environmental Consultants<br><b>SCOTT<br/>DOHERTY<br/>Associates</b> |  |



# **LEGEND**


**APPROXIMATE SITE BOUNDARY**

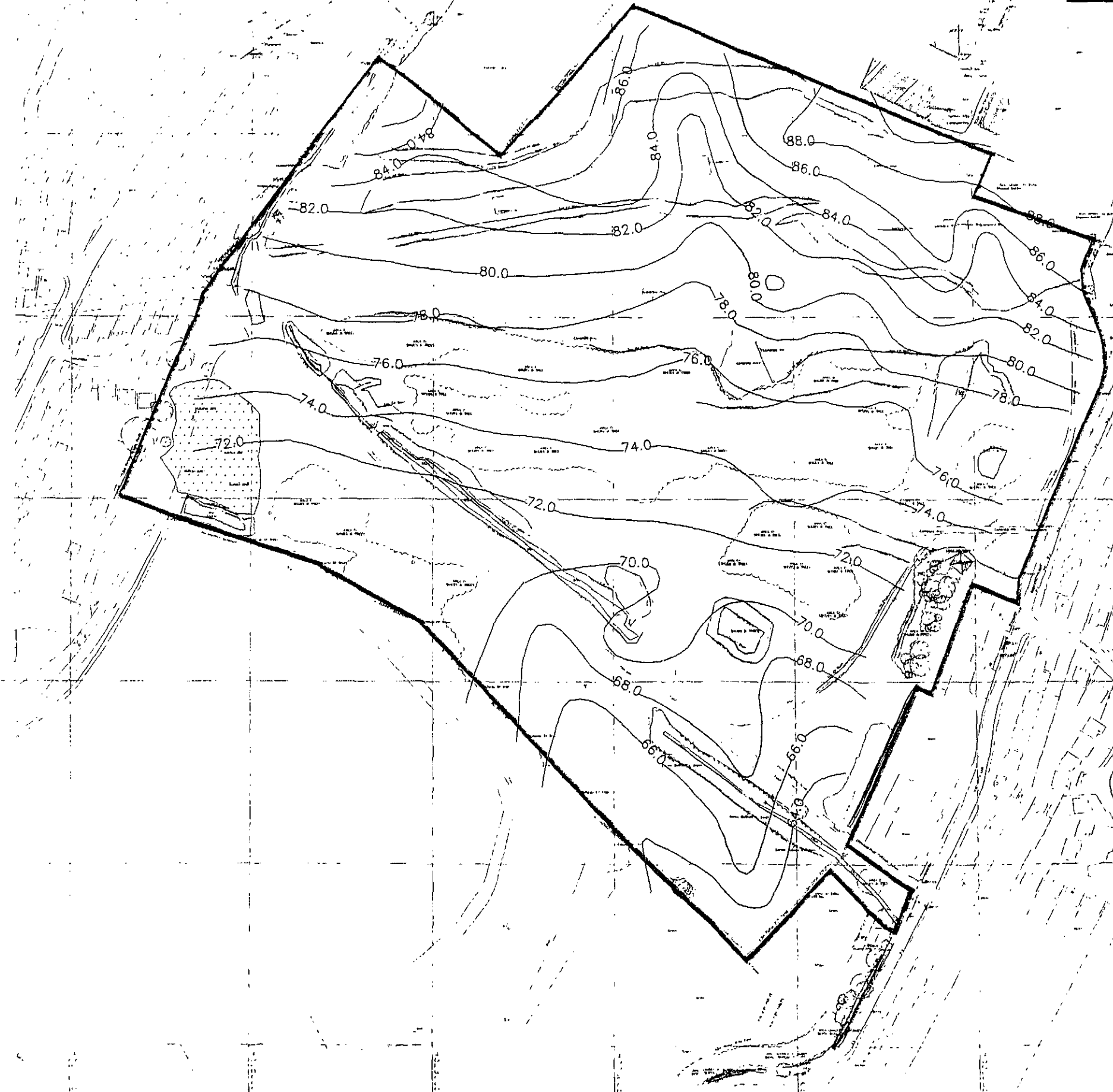
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| Client<br><b>GLADEDALE<br/>(SOUTH YORKSHIRE) LTD.</b>                                       |                       |                       |                      | Drawing Title<br><b>ROCKHEAD CONTOUR PLAN<br/>FIGURE 5</b> |  |
| Project<br><b>NORTH GAWBER COLLIERY SITE,<br/>BARNSELEY<br/>GROUND INVESTIGATION REPORT</b> |                       |                       |                      | Drawing No<br><b>SDA/07053/05</b>                          |  |
|                                                                                             |                       |                       |                      | Scale<br><b>1 : 2500</b>                                   |  |
|                                                                                             |                       |                       |                      | Status<br><b>FINAL</b>                                     |  |
| Drawn<br><b>JCF</b>                                                                         | Date<br><b>MAR 08</b> | Checked<br><b>DJL</b> | Passed<br><b>MJD</b> | Devised by Business Centre<br>Consultants Ltd<br>DHE 688   |  |
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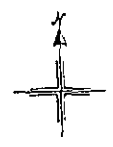
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Ordnance Datum (OD)



# LEGEND

— APPROXIMATE SITE BOUNDARY

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|---------------------------------------------------------------------------------|--------------|--------------|-------------|----------------------------------------------------------------------------------------|--|
| Client: GLADEDALE (SOUTH YORKSHIRE) LTD                                         |              |              |             | Drawing Title: HISTORICAL FEATURES PLAN<br>FIGURE 6                                    |  |
| Project: NORTH GAWBER COLLIERY SITE,<br>BARNSELY<br>GROUND INVESTIGATION REPORT |              |              |             | Drawing No: SDA/07053/06                                                               |  |
|                                                                                 |              |              |             | Scale: 1 : 2500                                                                        |  |
|                                                                                 |              |              |             | Status: FINAL                                                                          |  |
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|                                                                                 |              |              |             | Geotechnical and Environmental Consultants                                             |  |
|                                                                                 |              |              |             | SCOTT DOHERTY ASSOCIATES                                                               |  |

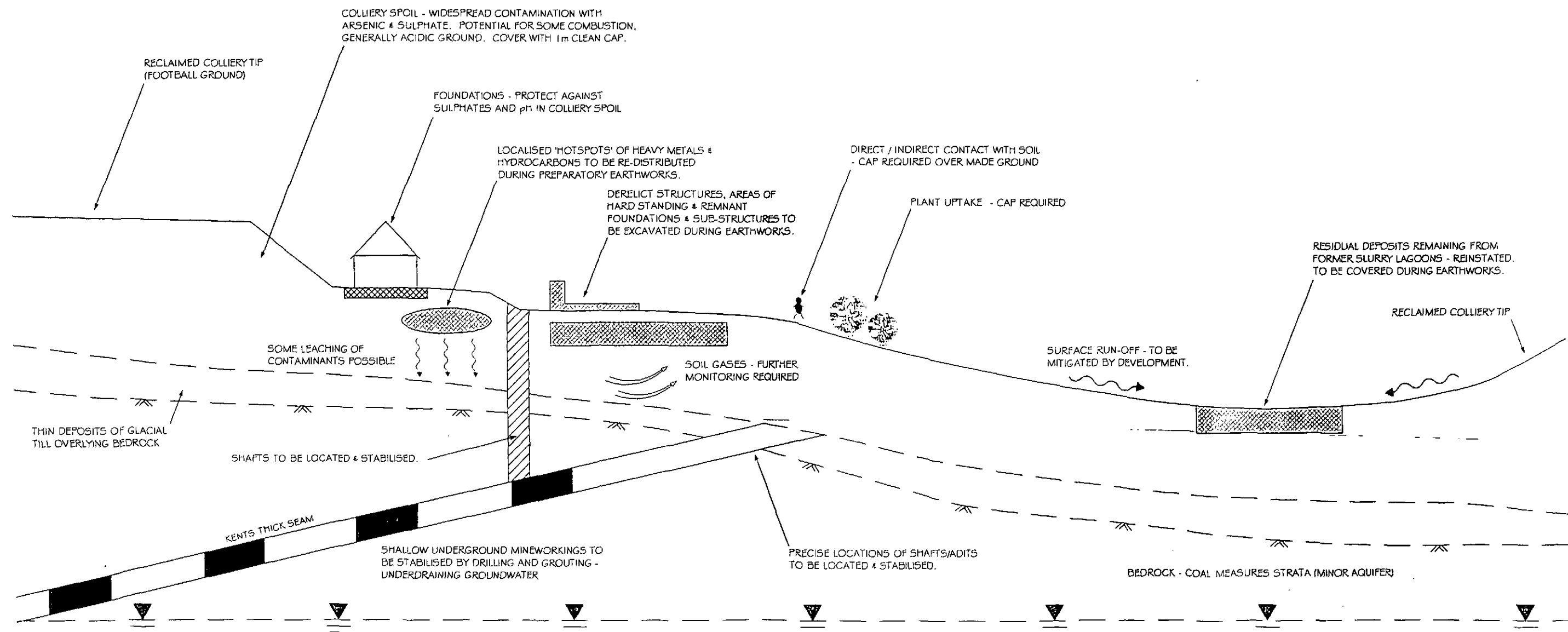


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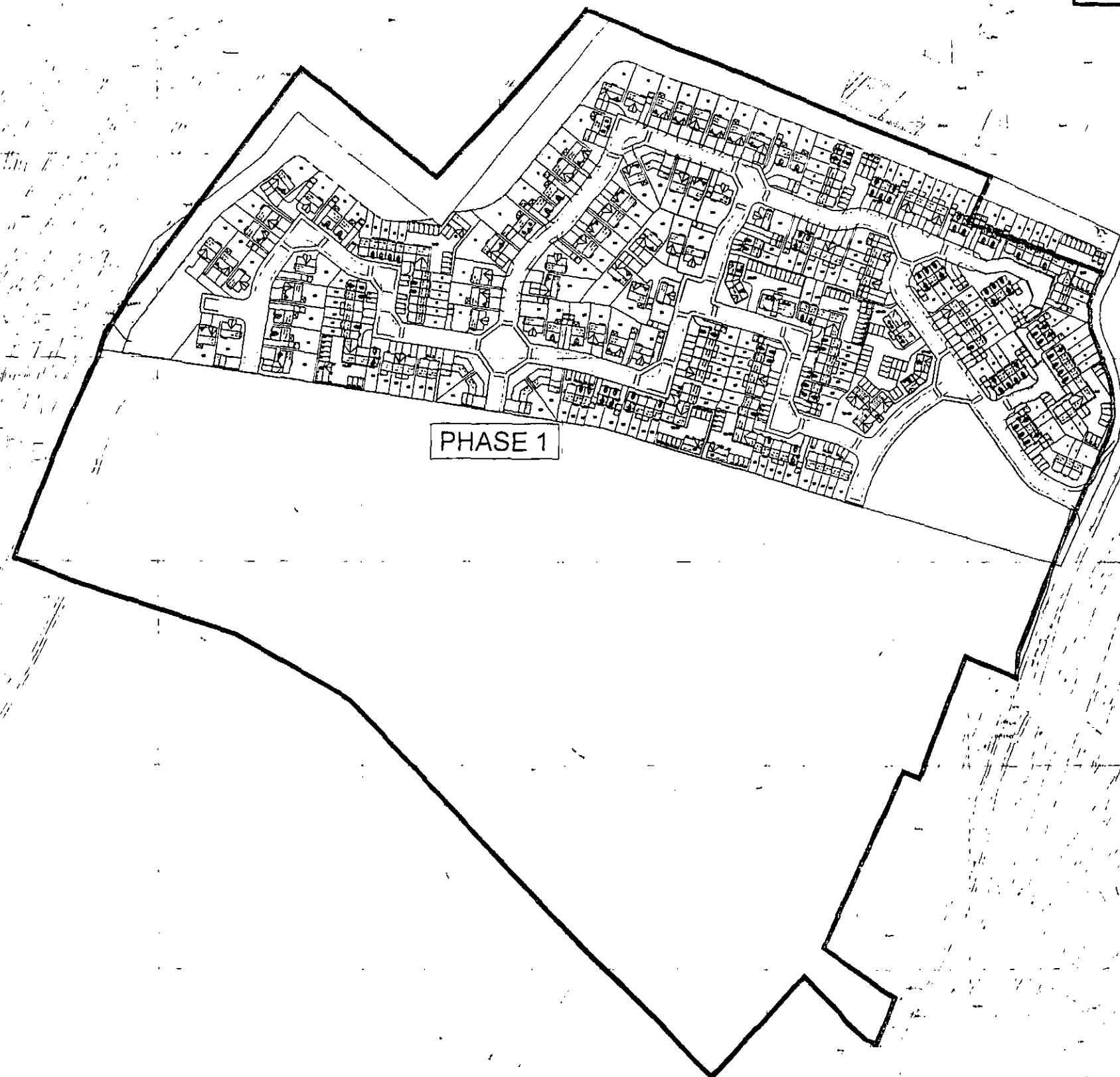
- APPROXIMATE SITE BOUNDARY
- ⊕ APPROXIMATE POSITION OF SHAFT
- ⊕ APPROXIMATE POSITION OF ADIT
- ▨ FORMER OPENCAST AREA
- ▤ FORMER COKE OVENS
- ▥ FORMER COLLIERY BUILDINGS
- ▧ FORMER LAGOONS / PONDS

|                                                                                            |                       |                       |                      |                                                                                                                               |  |
|--------------------------------------------------------------------------------------------|-----------------------|-----------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------|--|
| Client<br><b>GLADEDALE<br/>(SOUTH YORKSHIRE) LTD.</b>                                      |                       |                       |                      | Drawing Title<br><b>CONCEPTUAL MODEL<br/>FIGURE 11</b>                                                                        |  |
| Project<br><b>NORTH GAWBER COLLIERY SITE,<br/>BARNSELY<br/>GROUND INVESTIGATION REPORT</b> |                       |                       |                      | Drawing No<br><b>SDA/07053/11</b>                                                                                             |  |
|                                                                                            |                       |                       |                      | Scale<br><b>NTS</b>                                                                                                           |  |
|                                                                                            |                       |                       |                      | Status<br><b>FINAL</b>                                                                                                        |  |
| Drawn<br><b>JCF</b>                                                                        | Date<br><b>MAR 08</b> | Checked<br><b>DJL</b> | Passed<br><b>MJD</b> | Donventside Business Centre<br>Consett Business Park<br>Consett, Co. Durham<br>DH6 5BP                                        |  |
|                                                                                            |                       |                       |                      | Geotechnical and<br>Environmental Consultants                                                                                 |  |
|                                                                                            |                       |                       |                      | <br><b>SCOTT<br/>DOHERTY<br/>ASSOCIATES</b> |  |

## THE SITE



|                                                                        |        |          |         |                                                                                      |  |                                                                                                                       |                                               |
|------------------------------------------------------------------------|--------|----------|---------|--------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| GLADEDALE<br>(SOUTH YORKSHIRE) LTD                                     |        |          |         | DEVELOPMENT LAYOUT PLAN<br>FIGURE 12                                                 |  | <br>SCOTT<br>DOHERTY<br>ASSOCIATES |                                               |
| NORTH GAWBER COLLIERY SITE,<br>BARNSELY<br>GROUND INVESTIGATION REPORT |        |          |         | Drawing No: SDA/07053/12                                                             |  |                                                                                                                       |                                               |
|                                                                        |        |          |         | Scale: 1:2500                                                                        |  |                                                                                                                       |                                               |
|                                                                        |        |          |         | Status: FINAL                                                                        |  |                                                                                                                       |                                               |
| Drawn:                                                                 | Date:  | Checked: | Passed: | Approved & Business Centre<br>Consult Business Park<br>Consult Co. Durham<br>Dtd SEP |  |                                                                                                                       | Geotechnical and<br>Environmental Consultants |
| JCF                                                                    | MAR 08 | DL       | MJO     |                                                                                      |  |                                                                                                                       |                                               |



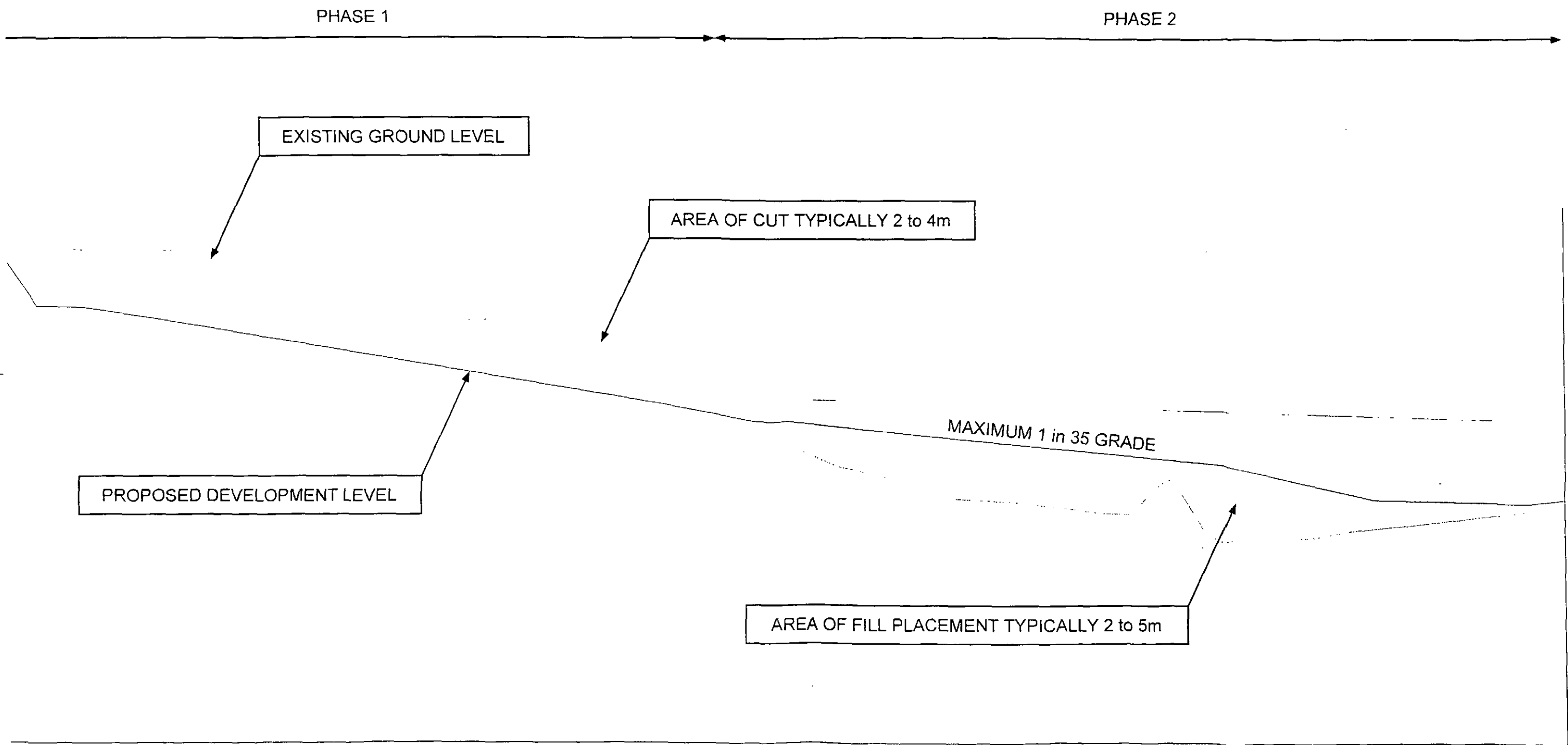
PHASE 1

## LEGEND

— APPROXIMATE SITE BOUNDARY



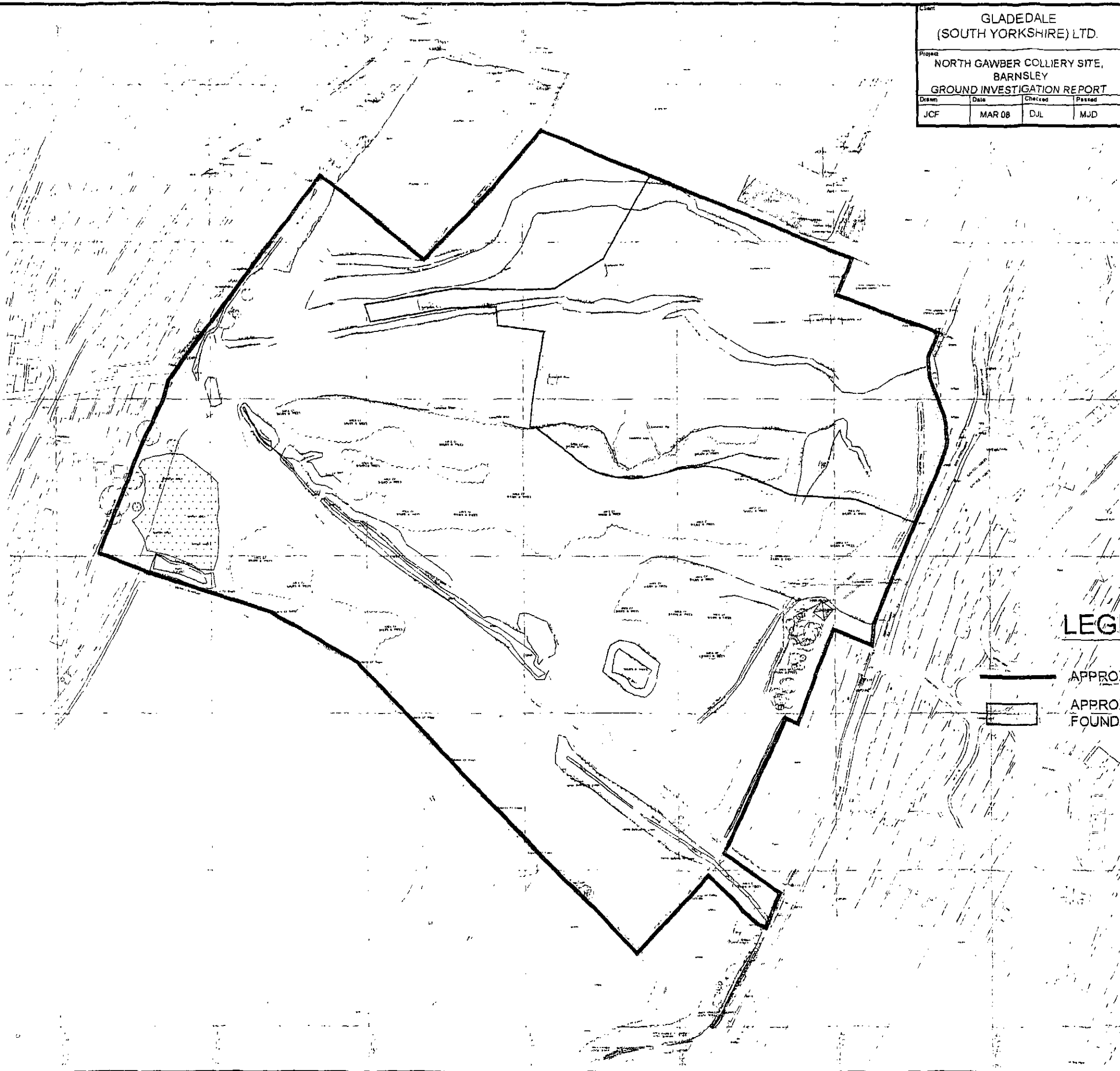
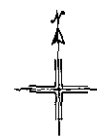
|                                                                                            |                       |                       |                      |                                                                                                 |  |
|--------------------------------------------------------------------------------------------|-----------------------|-----------------------|----------------------|-------------------------------------------------------------------------------------------------|--|
| Client<br><b>GLADEDAL<br/>(SOUTH YORKSHIRE) LTD.</b>                                       |                       |                       |                      | Drawing Title<br><b>TYPICAL SECTION SHOWING<br/>PROPOSED CUT AND FILL PROFILE<br/>FIGURE 13</b> |  |
| Project<br><b>NORTH GAWBER COLLIERY SITE,<br/>BARNSELY<br/>GROUND INVESTIGATION REPORT</b> |                       |                       |                      | Drawing No<br><b>SDA/07053/13</b>                                                               |  |
| Status<br><b>FINAL</b>                                                                     |                       |                       |                      | Scale<br><b>1 : 250 VERTICAL : 1 : 1000 HORIZONTAL</b>                                          |  |
| Drawn<br><b>JCF</b>                                                                        | Date<br><b>MAR 08</b> | Checked<br><b>DJL</b> | Passed<br><b>MJO</b> | Geotechnical and<br>Environmental Consultants<br><b>SCOTT DOHERTY<br/>associates</b>            |  |



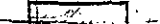
|                                                             |                       |                       |                      |                                                                                                                                      |  |
|-------------------------------------------------------------|-----------------------|-----------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|--|
| Client<br><b>GLADEDALE<br/>(SOUTH YORKSHIRE) LTD.</b>       |                       |                       |                      | Drawing Title<br><b>APPROXIMATE AREA OF BURIED REMNANT<br/>FOUNDATIONS AND SUB-STRUCTURES<br/>FIGURE 14</b>                          |  |
| Project<br><b>NORTH GAWBER COLLIERY SITE,<br/>BARNSELEY</b> |                       |                       |                      | Drawing No<br><b>SDA/07053/14</b>                                                                                                    |  |
| Ground Investigation Report                                 |                       |                       |                      | Scale<br><b>1 : 2500</b>                                                                                                             |  |
|                                                             |                       |                       |                      | Status<br><b>FINAL</b>                                                                                                               |  |
| Drawn<br><b>JCF</b>                                         | Date<br><b>MAR 08</b> | Checked<br><b>DJL</b> | Passed<br><b>MJD</b> | Donwells Business Centre<br>Consett Business Park<br>Consett, Co. Durham<br>DN2 6BP<br>Geotechnical and<br>Environmental Consultants |  |



SCOTT  
DOHERTY  
Associates

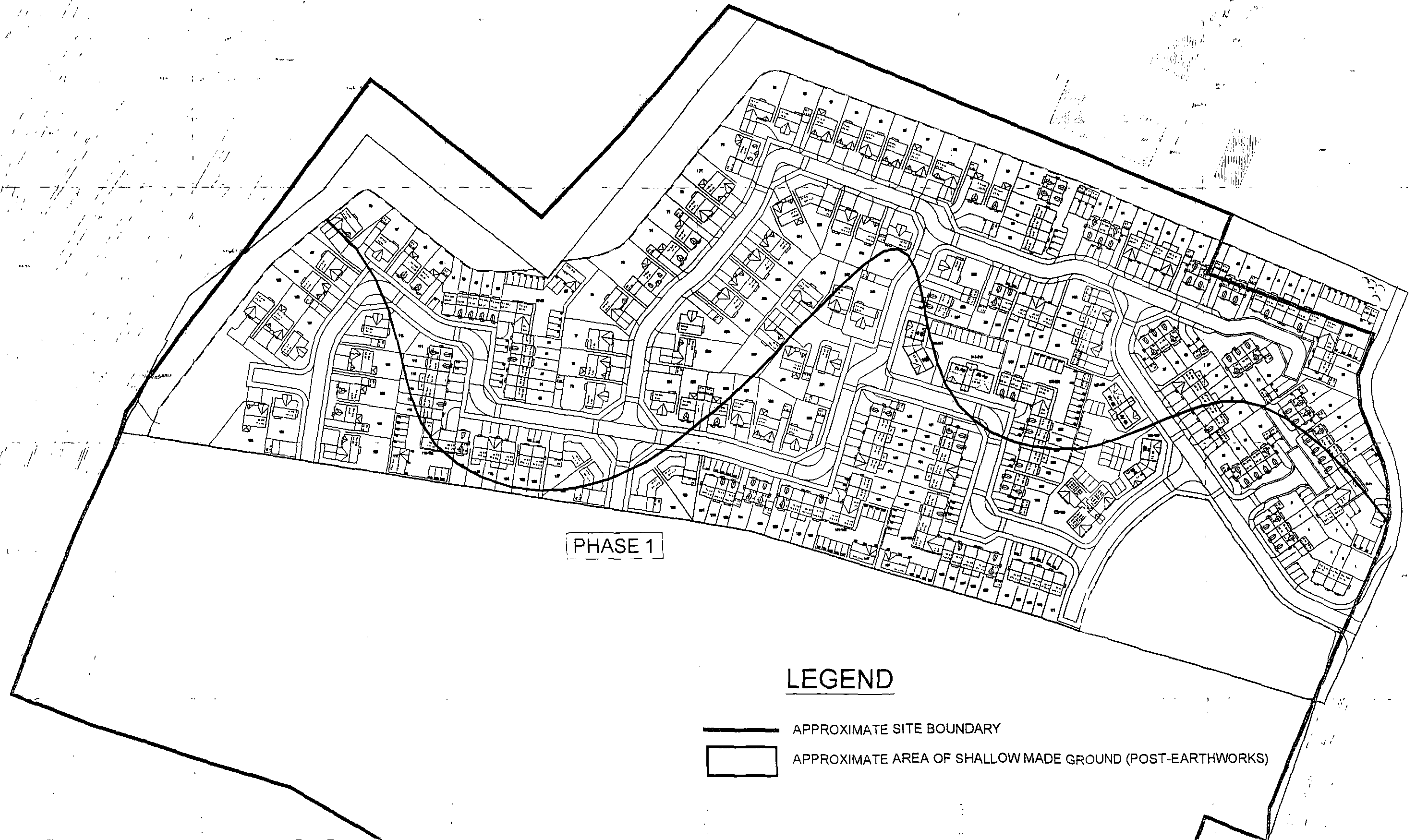
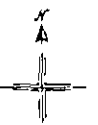


## LEGEND

-  APPROXIMATE SITE BOUNDARY
-  APPROXIMATE AREA OF BURIED REMNANT FOUNDATIONS AND SUB-STRUCTURES

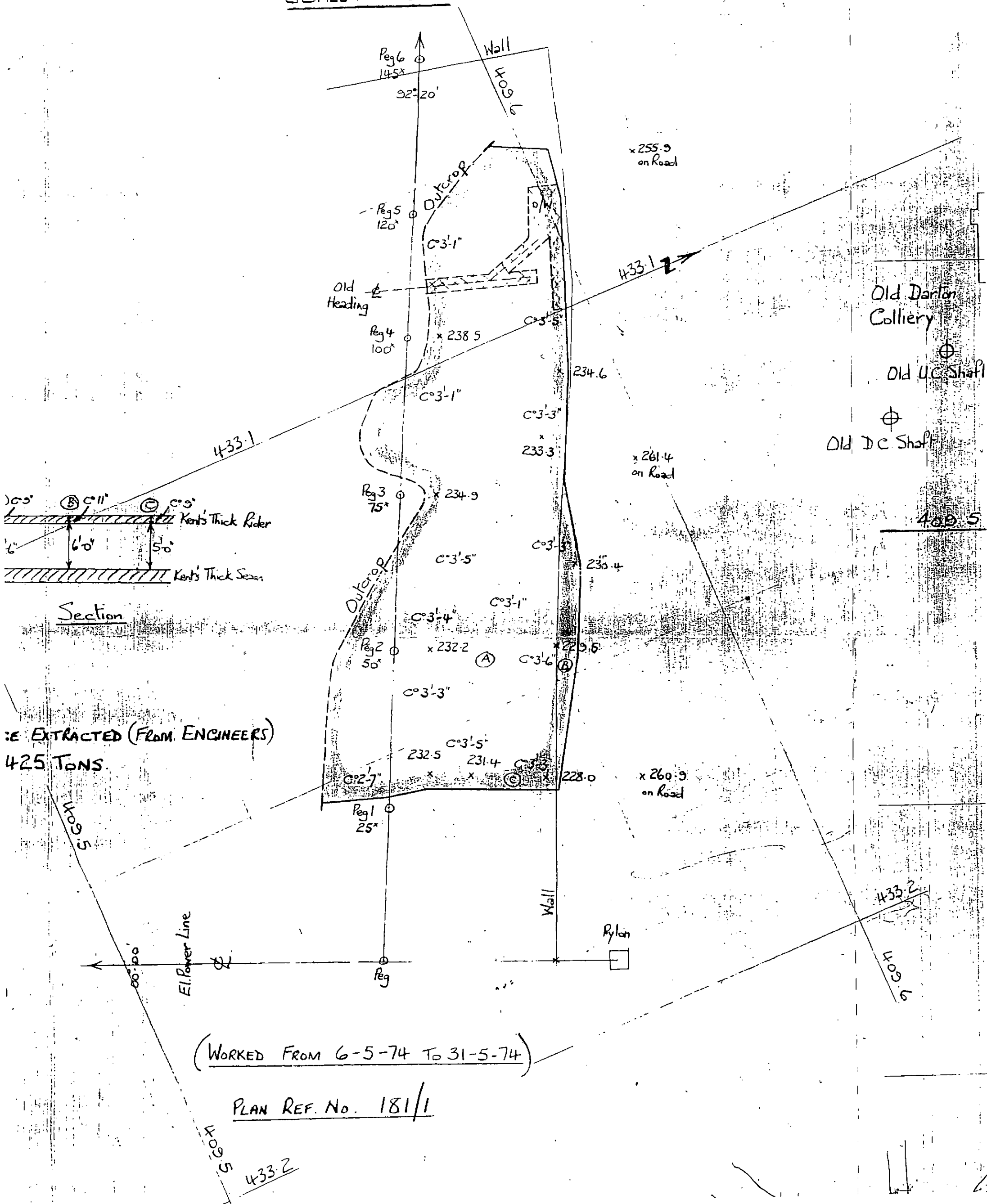


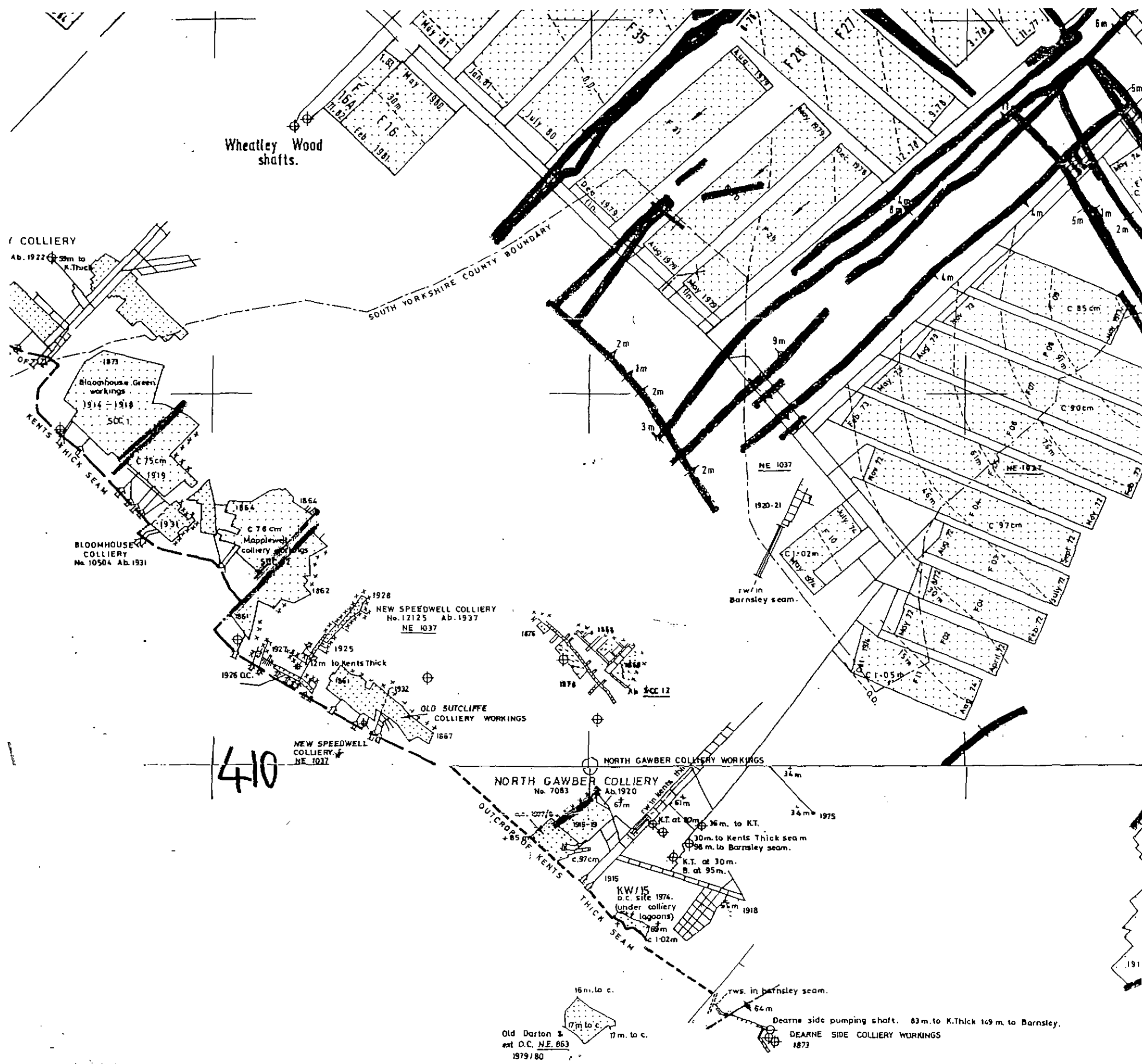
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|-----------------------------------------------|--------------|--------------|--------------|---------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------|
| Client: GLADEDALE (SOUTH YORKSHIRE) LTD       |              |              |              | Drawing Title: APPROXIMATE AREA OF SHALLOW MADE GROUND (POST-EARTHWORKS)              |  | <br>SCOTT DOHERTY<br>associates |
| Project: NORTH GAWBER COLLIERY SITE, BARNSELY |              |              |              | Drawing No: SDA/07053/15                                                              |  |                                                                                                                   |
| Ground Investigation Report                   |              |              |              | Scale: 1:1500                                                                         |  |                                                                                                                   |
|                                               |              |              |              | Status: FINAL                                                                         |  |                                                                                                                   |
|                                               |              |              |              |                                                                                       |  |                                                                                                                   |
| Drawn: JCF                                    | Date: MAR 08 | Checked: JCF | Revised: JCF | Donventide Business Centre<br>Consult Business Park<br>Consult, Co. Durham<br>DN9 6BB |  | Geotechnical and<br>Environmental Consultants                                                                     |



KENT'S THICK SEAM OPENCAST SITE  
(New Tailings Lagoons off Carr Green Lane)

— SCALE: — 1/500 —





410

409  
432

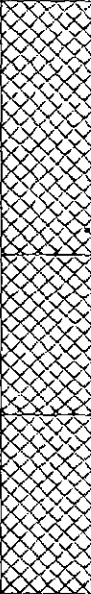
433

434

**APPENDIX A**  
**Mine Plans**

**APPENDIX B**  
**Trial Pit Logs**

Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                                         |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                                             | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of firm dark grey and brown sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale, coal, burnt shale and brick. Cobbles of whole brick, unburnt shale and burnt shale present also). | (1.70)                       |                      | 2.40      | B    | 0.70      |      | 64 / 0 kPa            |
| 2.00      |                                                                                   | MADE GROUND (Colliery discard consisting of soft dark brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine and medium angular unburnt and burnt shale).                                                                                                      | (1.10)                       | 82.90                |           |      |           |      |                       |
| 3.00      |                                                                                   | MADE GROUND (Stiff light grey sandy slightly gravelly reworked clay. Sand is fine to coarse. Gravel is fine to coarse angular shale. Cobbles of shale present also).                                                                                                                    | (1.20)                       | 81.80                |           |      | 3.00      |      | 72 / 0 kPa            |
| 4.00      |                                                                                   | Stiff light grey mottled light brown sandy CLAY. Sand is fine to coarse. Cobbles of shale present also.                                                                                                                                                                                 | 4.00                         | 80.60                |           |      | 3.80      |      | 90 / 0 kPa            |
|           |                                                                                   |                                                                                                                                                                                                                                                                                         | (0.60)                       |                      |           |      | 4.10      |      | 63 / 0 kPa            |
|           |                                                                                   | End of Trial Pit at 4.60 m                                                                                                                                                                                                                                                              | 4.60                         | 80.00                |           |      |           |      |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 17/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 84.6<br>Coordinates: 432828E - 409749N                                                               | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|            |                       |                   |
|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP1        | North Gawber Colliery | Project No. 07053 |

  
**SCOTT DOHERTY**  
 ASSOCIATES

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                            |                              |                      | Samples                                      |                   | Tests     |      |                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)        |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of brown clayey fine to coarse gravelly sand. Gravel is angular and subangular unburnt shale with some burnt shale).                              | 0.10                         | 87.90                | 0.10                                         | B                 |           |      |                              |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of stiff red very sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular burnt shale).                      | (1.20)                       |                      | 1.10                                         | B                 | 1.00      |      | 101 / 0 kPa                  |
|                                                                                                                                                                                              |        |                                                                                                                                                                                            | 1.30                         | 86.70                |                                              |                   | 1.20      |      | 91 / 0 kPa                   |
| 2.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of stiff dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale).                   | (0.45)                       | 86.25                | 1.85                                         | B                 |           |      |                              |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of brown slightly clayey slightly gravelly fine to coarse sand. Gravel is fine to coarse angular and subangular unburnt shale).                   | (0.85)                       |                      | 2.70                                         | B                 |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                            | 2.60                         | 85.40                |                                              |                   |           |      |                              |
| 3.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of soft red slightly sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular burnt shale and unburnt shale). | (0.55)                       |                      | 3.20                                         | B                 |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                            | 3.15                         | 84.85                |                                              |                   |           |      |                              |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of red slightly clayey fine to coarse sandy gravel of angular and subangular burnt shale. Some cobbles of burnt shale present also).              | (1.05)                       |                      | 4.25                                         | B                 | 4.30      |      | 31 / 0 kPa                   |
| 4.00                                                                                                                                                                                         |        |                                                                                                                                                                                            | 4.20                         | 83.80                |                                              |                   |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                            | 4.30                         | 83.70                |                                              |                   |           |      |                              |
|                                                                                                                                                                                              |        | Continued next sheet                                                                                                                                                                       |                              |                      |                                              |                   |           |      |                              |
| Date of Excavation: 17/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 88.0<br>Coordinates: 432863E - 409772N                                                               |        |                                                                                                                                                                                            |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                              |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                            |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                              |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                            | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP2                                                                                                                                                                                          |        |                                                                                                                                                                                            | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                              |

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                              |                              |                      | Samples                                      |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|                                                                                                                                                                                              |        | and medium angular and subangular burnt shale.<br>End of Trial Pit at 4.30 m |                              |                      |                                              |                   |           |      |                       |
| 5.00                                                                                                                                                                                         |        |                                                                              |                              |                      |                                              |                   |           |      |                       |
| 7.00                                                                                                                                                                                         |        |                                                                              |                              |                      |                                              |                   |           |      |                       |
| 8.00                                                                                                                                                                                         |        |                                                                              |                              |                      |                                              |                   |           |      |                       |
| 9.00                                                                                                                                                                                         |        |                                                                              |                              |                      |                                              |                   |           |      |                       |
| Date of Excavation: 17/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 88.0<br>Coordinates: 432863E - 409772N                                                               |        |                                                                              |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                              |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |        |                                                                              | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      |                       |
| TP2                                                                                                                                                                                          |        |                                                                              | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                       |



SCOTT  
DOHERTY  
ASSOCIATES



Photograph:

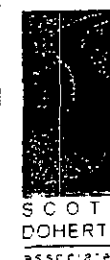
| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                                                                                              |                              |                      | Samples                                     |                   | Tests     |            |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE       | Shear Vane (Peak/Res) |
|                                                                                                                                                                                              |                                                                                   | TOPSOIL.                                                                                                                                                                                                                                                                                                     | 0.20                         | 94.20                | 0.20                                        | B                 |           |            |                       |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of predominantly firm and stiff, but with soft pockets, dark grey very sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular coal, unburnt shale, burnt shale, siltstone and timber. Cobbles of unburnt shale present also). | (3.50)                       |                      | 0.50                                        | B                 | 0.75      |            | 113 / 0 kPa           |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                                                              |                              |                      |                                             | 1.50              |           | 35 / 0 kPa |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                              |                              |                      | B                                           |                   |           |            |                       |
| 3.70                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                              |                              |                      | B                                           |                   |           |            |                       |
| 4.00                                                                                                                                                                                         |                                                                                   | MADE GROUND (Colliery discard consisting of soft wet red sandy gravelly clay. Sand is fine to coarse. Gravel is fine and medium angular and subangular burnt shale).                                                                                                                                         | 3.70                         | 90.70                | 3.70                                        |                   |           |            |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                                                              | (0.80)                       |                      |                                             |                   |           |            |                       |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 4.50 m                                                                                                                                                                                                                                                                                   | 4.50                         | 89.90                |                                             |                   |           |            |                       |
| Date of Excavation: 17/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 94.4<br>Coordinates: 432904E - 409799N                                                               |                                                                                   |                                                                                                                                                                                                                                                                                                              |                              |                      | Groundwater:<br>Steady seepage at 2.0m bgl. |                   |           |            |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                                                                                              |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |            |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                                                                              | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |            |                       |
| TP3                                                                                                                                                                                          |                                                                                   |                                                                                                                                                                                                                                                                                                              | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |            |                       |



SCOTT  
COHERLY  
ASSOCIATES

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                           |                                               | Samples              |           | Tests                                    |           |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------|-----------|------------------------------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                               | Strata Depth (Thickness) (m)                  | Reduced Level (mAOD) | Depth (m) | Type                                     | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|                                                                                                                                                                                              |        | TOPSOIL                                                                                                                                                                                                   | 0.10                                          | 95.20                | 0.00      |                                          |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of light and dark grey clayey fine to coarse sandy gravel. Gravel is angular sandstone and coal. Occasional cobbles and boulders of sandstone present).          | 0.75                                          |                      |           |                                          |           |      |                       |
| 1.00                                                                                                                                                                                         |        |                                                                                                                                                                                                           | 0.85                                          | 94.45                |           |                                          |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of brown clayey fine to coarse sandy gravel of angular sandstone, coal, unburnt shale and burnt shale. Some cobbles and boulders of unburnt shale present also). | 1.25                                          |                      |           |                                          |           |      |                       |
| 2.00                                                                                                                                                                                         |        |                                                                                                                                                                                                           | 2.10                                          | 93.20                |           |                                          |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of soft and firm reddish brown slightly sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular burnt shale, coal and brick).              | 2.40                                          |                      |           |                                          | 3.10      |      | 20 / 0 kPa            |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                                                                           |                                               |                      |           |                                          |           |      |                       |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                           | 4.50                                          | 90.80                |           |                                          | 4.10      |      | 36 / 0 kPa            |
| 4.00                                                                                                                                                                                         |        |                                                                                                                                                                                                           |                                               |                      |           |                                          |           |      |                       |
|                                                                                                                                                                                              |        | End of Trial Pit at 4.50 m                                                                                                                                                                                |                                               |                      |           |                                          |           |      |                       |
| Date of Excavation: 17/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 95.3<br>Coordinates: 433050E - 409843N                                                               |        |                                                                                                                                                                                                           | Groundwater:<br>Groundwater not encountered.  |                      |           |                                          |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                           | Remarks:<br>Trial pit sides stable.           |                      |           |                                          |           |      |                       |
| Trial Pit:<br><br>TP4                                                                                                                                                                        |        |                                                                                                                                                                                                           | TRIAL PIT RECORD<br><br>North Gawber Colliery |                      |           | Revision: Final<br><br>Project No. 07053 |           |      |                       |



Photograph:

| Strata                     |                                                                                   |                                                                                                                                                                                                                  |                              |                      | Samples   |      | Tests     |      |                       |
|----------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m)                  | Legend                                                                            | Description                                                                                                                                                                                                      | Strata Depth (Thickness) (m) | Reduced Level (mVAD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                       |  | MADE GROUND (Colliery discard consisting of grey slightly clayey fine to coarse sandy gravel. Gravel is angular and subangular burnt shale, unburnt shale and timber. Old timber railway sleepers present also). | (1.00)                       |                      | 0.10      | B    | 2.20      |      | 89 / 0 kPa            |
|                            |                                                                                   |                                                                                                                                                                                                                  | 1.00                         | 80.20                | 1.00      | B    |           |      |                       |
| 2.00                       |  | MADE GROUND (Colliery discard consisting of dark brown slightly clayey fine to coarse sandy gravel. Gravel is angular unburnt shale).                                                                            | (0.90)                       |                      |           |      |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                  | 1.90                         | 79.30                | 1.90      | B    |           |      |                       |
|                            |  | Stiff grey mottled light brown sandy CLAY. Sand is fine to coarse.                                                                                                                                               | (0.50)                       |                      |           |      |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                  | 2.40                         | 78.80                |           |      |           |      |                       |
| End of Trial Pit at 2.40 m |                                                                                   |                                                                                                                                                                                                                  |                              |                      |           |      |           |      |                       |
| 3.00                       |                                                                                   |                                                                                                                                                                                                                  |                              |                      |           |      |           |      |                       |
| 4.00                       |                                                                                   |                                                                                                                                                                                                                  |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 17/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 81.2<br>Coordinates: 432798E - 409722N                                                               | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|                       |                       |                   |
|-----------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP5 | TRIAL PIT RECORD      | Revision: Final   |
|                       | North Gawber Colliery | Project No. 07053 |



Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                            |                              |                      | Samples                                      |                   | Tests     |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
| 1.00<br>2.00<br>3.00<br>4.00                                                                                                                                                                 |  | MADE GROUND (Dark grey slightly clayey fine to coarse sandy gravel of angular shale. Cobbles of shale and pieces of timber present also. Railway lines found at 0.3m bgl). | (0.60)<br>0.60               | 83.00                | 0.10                                         | B                 |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of black slightly clayey fine to coarse gravelly sand. Gravel is angular and subangular coal, shale and brick).                   | (1.70)                       |                      | 0.70                                         | B                 |           |      |                                                                                                                   |
|                                                                                                                                                                                              |  | Firm light brown sandy to very sandy CLAY. Sand is fine to coarse.                                                                                                         | 2.30<br>(0.30)<br>2.60       | 81.30<br>81.00       | 2.00                                         | B                 |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 2.60 m                                                                                                                                                 |                              |                      | 2.50                                         | B                 |           |      |                                                                                                                   |
| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 83.6<br>Coordinates: 432852E - 409728N                                                               |                                                                                   |                                                                                                                                                                            |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                            |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                            | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP6                                                                                                                                                                                          |                                                                                   |                                                                                                                                                                            | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                                                                                                                   |

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                          |                              |                      | Samples                                     |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                              | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of grey slightly clayey fine to coarse sandy gravel of angular burnt shale and unburnt shale).                                                                  | 0.10                         | 83.40                | 0.20                                        | B                 |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of black slightly clayey slightly gravelly fine to coarse sand. Gravel is fine to coarse angular unburnt shale and coal Cobbles of unburnt shale present also). | 0.75                         | 82.75                |                                             |                   |           |      |                       |
| 1.00                                                                                                                                                                                         |        |                                                                                                                                                                                                          | 0.85                         | 82.55                | 1.00                                        | B                 |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of brown slightly clayey fine to coarse sandy gravel of unburnt shale).                                                                                         |                              |                      |                                             |                   |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Orange slightly clayey fine to coarse sandy gravel of angular unburnt shale and siltstone).                                                                                                 | (1.55)                       |                      |                                             |                   |           |      |                       |
| 2.00                                                                                                                                                                                         |        |                                                                                                                                                                                                          | 2.50                         | 81.00                |                                             |                   |           |      |                       |
|                                                                                                                                                                                              |        | Firm orange mottled light brown slightly sandy to sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular shale, siltstone and coal. Cobbles of siltstone present also.            |                              |                      |                                             |                   | 2.50      |      | 48 / 0 kPa            |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                                                                          | (1.50)                       |                      | 3.00                                        | B                 |           |      |                       |
| 4.00                                                                                                                                                                                         |        | End of Trial Pit at 4.00 m                                                                                                                                                                               | 4.00                         | 79.50                |                                             |                   |           |      |                       |
| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 83.5<br>Coordinates: 432899E - 409712N                                                               |        |                                                                                                                                                                                                          |                              |                      | Groundwater:<br>Groundwater not encountered |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                          |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                                          | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |      |                       |
| TP7                                                                                                                                                                                          |        |                                                                                                                                                                                                          | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |      |                       |



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                           |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                               | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|           |  | MADE GROUND (Colliery discard consisting of grey slightly clayey fine to coarse gravelly sand. Gravel is angular unburnt shale and coal).                                                                                                                                 | (0.50)                       | 85.90                |           |      |           |      |                       |
| 1.00      |                                                                                   | MADE GROUND (Colliery discard consisting of soft and firm dark brown sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular burnt shale, unburnt shale and coal. Rubber pipe and cobbles of whole brick, siltstone and unburnt shale present also. | (1.50)                       |                      | 0.60      | B    | 1.00      |      | 35 / 0 kPa            |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                                           |                              |                      |           | 1.80 | B         | 1.70 |                       |
|           |                                                                                   | MADE GROUND (Concrete).<br>End of Trial Pit at 2.10 m                                                                                                                                                                                                                     | 2.10                         | 85.30                |           |      |           |      |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                                           |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                                           |                              |                      |           |      |           |      |                       |

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| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 87.4<br>Coordinates: 432938E - 409768N                                                               | Groundwater:<br>Groundwater not encountered.                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Trial pit terminated at 2.1m bgl due to refusal upon encountering concrete. |

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|-----------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP8 | TRIAL PIT RECORD      | Revision: Final   |
|                       | North Gawber Colliery | Project No. 07053 |

  
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Photograph:

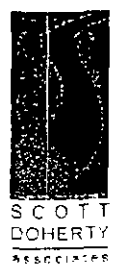
| Strata    |                                                                                   |                                                                                                                                                                                                                                         |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                             | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of soft and firm dark brown sandy gravelly clay with cobbles of siltstone, sandstone and bricks. Sand is fine to coarse. Gravel is fine to coarse angular burnt shale, unburnt shale and coal. | (2.20)                       |                      |           |      |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                         |                              |                      |           |      |           |      |                       |
|           |                                                                                   | MADE GROUND (Concrete)<br>End of Trial Pit at 2.20 m                                                                                                                                                                                    | 2.20                         | 85.20                |           |      |           |      |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                         |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                         |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date of Excavation: 10/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 87.4<br>Coordinates: 432938E - 409768N                                                                | Groundwater:<br>Groundwater not encountered.                                                                                                                                                            |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Trial pit terminated at 2.1m bgl due to refusal upon encountering concrete.<br>The concrete was found to be sloping, from ground level to a maximum of 2.2m bgl. |

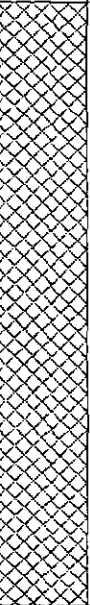
  

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| Trial Pit:<br><br>TP8A | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



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Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                         |                              | Samples              |                                                                                                                                | Tests             |           |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                             | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                                                                                                      | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of soft and firm dark brown sandy gravelly clay with cobbles of siltstone, sandstone and bricks. Sand is fine to coarse. Gravel is fine to coarse angular burnt shale, unburnt shale and coal. | (4.10)                       |                      | 1.50                                                                                                                           | ES<br>B           |           |      |                       |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                         |                              |                      |                                                                                                                                |                   |           |      |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                         |                              |                      |                                                                                                                                |                   |           |      |                       |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                         |                              |                      |                                                                                                                                |                   |           |      |                       |
| End of Trial Pit at 4.10 m                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                         | 4.10                         | 83.30                |                                                                                                                                |                   |           |      |                       |
| Date of Excavation: 10/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 87.4<br>Coordinates: 432938E - 409768N                                                                |                                                                                   |                                                                                                                                                                                                                                         |                              |                      | Groundwater:<br>Groundwater not encountered.                                                                                   |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                         |                              |                      | Remarks:<br>Trial pit sides stable.<br>Concrete was encountered in side of trial pit at 0.2m bgl. The concrete was 0.2m thick. |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                         | TRIAL PIT RECORD             |                      |                                                                                                                                | Revision: Final   |           |      |                       |
| TP8B                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                         | North Gawber Colliery        |                      |                                                                                                                                | Project No. 07053 |           |      |                       |



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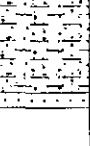


Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                            |                                                                                                                     |                      | Samples                                      |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                | Strata Depth (Thickness) (m)                                                                                        | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|                                                                                                                                                                                              |  | MADE GROUND (Reinforced concrete)                                                                                                                                                          | 0.20                                                                                                                | 84.30                | 0.50                                         | ES<br>B           |           |      |                       |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of clay bound grey/black fine to coarse sandy gravel of subangular sandstone unburnt shale and much coal. Cobbles of sandstone present also).     | (0.40)                                                                                                              |                      |                                              |                   |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                            | 0.60                                                                                                                | 83.90                |                                              |                   |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                            | 0.70                                                                                                                | 83.80                |                                              |                   |           |      |                       |
| 1.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                            | MADE GROUND (Colliery discard consisting of red fine to coarse sandy gravel of angular and subangular burnt shale). |                      |                                              | 2.00              | ES<br>B   |      |                       |
| 2.00                                                                                                                                                                                         |                                                                                   | MADE GROUND (Colliery discard consisting of grey/black fine to coarse gravel of angular and subangular unburnt shale, sandstone and coal. Cobbles and boulders of sandstone also present). | (3.40)                                                                                                              |                      |                                              |                   |           |      |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                            |                                                                                                                     |                      |                                              |                   |           |      |                       |
| 4.00                                                                                                                                                                                         |                                                                                   | End of Trial Pit at 4.10 m                                                                                                                                                                 | 4.10                                                                                                                | 83.40                |                                              |                   |           |      |                       |
| Date of Excavation: 05/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 84.5<br>Coordinates: 432962E - 409692N                                                                |                                                                                   |                                                                                                                                                                                            |                                                                                                                     |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                            |                                                                                                                     |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                            | TRIAL PIT RECORD                                                                                                    |                      |                                              | Revision: Final   |           |      |                       |
| TP9                                                                                                                                                                                          |                                                                                   |                                                                                                                                                                                            | North Gawber Colliery                                                                                               |                      |                                              | Project No. 07053 |           |      |                       |



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                     |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                         | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| -1.00     |  | MADE GROUND (Grey slightly clayey slightly sandy fine to coarse gravel of angular brick and unburnt shale. Sand is fine to coarse. Cobbles of brick and plastic pipe present also). | (1.00)                       |                      | 0.10      | B    |           |      |                       |
|           |                                                                                   | MADE GROUND (Concrete).                                                                                                                                                             | 1.00                         | 84.50                |           |      |           |      |                       |
| -2.00     |  | Firm friable grey/yellow mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal.               | (1.50)                       |                      |           |      | 2.00      |      | 102 / 0 kPa           |
|           |                                                                                   |                                                                                                                                                                                     | 1.20                         | 84.30                |           |      |           |      |                       |
| -3.00     |  | Yellow SANDSTONE recovered as angular and subangular fine to coarse gravel.                                                                                                         | 2.80                         | 82.70                |           |      |           |      |                       |
|           |                                                                                   | End of Trial Pit at 2.90 m                                                                                                                                                          | 2.90                         | 82.60                |           |      |           |      |                       |
| -4.00     |                                                                                   |                                                                                                                                                                                     |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                                                                              |
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| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 85.5<br>Coordinates: 433002E - 409754N                                                               | Groundwater:<br>Groundwater not encountered                                                  |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Trial pit located between two brick walls to 1.2m bgl |

|                        |                                                      |                                          |
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| Trial Pit:<br><br>TP10 | <b>TRIAL PIT RECORD</b><br><br>North Gawber Colliery | Revision: Final<br><br>Project No. 07053 |
|------------------------|------------------------------------------------------|------------------------------------------|



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                     |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                         | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|           |  | MADE GROUND (Grey slightly clayey very gravelly fine to coarse sand. Gravel is fine to coarse angular unburnt shale and siltstone. Cobbles of brick and pieces of timber present also).                             | 0.20                         | 86.10                | 0.30      | B    |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                     | (0.40)                       |                      |           |      |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                     | 0.60                         | 85.70                |           |      |           |      |                       |
| 1.00      |                                                                                   | MADE GROUND (Colliery discard consisting of dark brown slightly clayey fine to coarse gravelly sand. Gravel is angular and subangular unburnt shale, coal, timber and burnt shale. Railway line found at 0.4m bgl). |                              |                      |           |      |           |      |                       |
| 2.00      |                                                                                   | MADE GROUND (Concrete).                                                                                                                                                                                             |                              |                      |           |      |           |      |                       |
| 3.00      |                                                                                   | End of Trial Pit at 0.60 m                                                                                                                                                                                          |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                     |                              |                      |           |      |           |      |                       |

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| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 86.3<br>Coordinates: 433058E - 409751N                                                               | Groundwater:<br>Groundwater not encountered.                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Trial pit terminated at 0.6m bgl due to refusal upon encountering concrete. |

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| Trial Pit:<br><br>TP11 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



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Photograph:

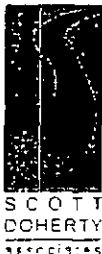
| Strata    |                                                                                   |                                                                                                                                                                                                                                                                                                            |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                                                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of grey slightly clayey very gravelly fine to coarse sand. Gravel is fine to coarse angular unburnt shale and siltstone. Cobbles of brick and old timber railway sleepers present also).                                                                          | 0.70                         | 88.60                | 0.80      | B    | 1.50      |      | 45 / 0 kPa            |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of soft and firm dark brown sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale, coal and sandstone. Some cobbles and boulders of unburnt shale, sandstone and siltstone present also. Steel cable found). | (1.40)                       |                      |           |      |           |      |                       |
|           |                                                                                   | MADE GROUND (Concrete).<br>End of Trial Pit at 2.10 m                                                                                                                                                                                                                                                      | 2.10                         | 87.20                |           |      |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                                                                            |                              |                      | 2.00      | B    |           |      |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                                                                            |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                                                                            |                              |                      |           |      |           |      |                       |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 89.3<br>Coordinates: 433018E - 409781N                                                               | Groundwater:<br>Groundwater not encountered.                                                                                  |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit unstable after 0.7m bgl.<br>Trial pit terminated at 2.6m bgl due to refusal upon encountering concrete. |

|                        |                       |                   |
|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP12 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



SCOTT DOHERTY  
CONSULTANTS

Photograph:

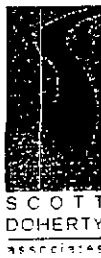
| Strata    |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of grey/black clay bound fine to coarse sandy gravel. Gravel is angular and subangular unburnt shale, coal and sandstone. Some cobbles and boulders of unburnt shale, sandstone and siltstone present also). | (2.20)                       |                      |           |      |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                       | 2.20                         | 87.10                |           |      |           |      |                       |
|           |                                                                                   | MADE GROUND (Concrete).<br>End of Trial Pit at 2.20 m                                                                                                                                                                                                 |                              |                      |           |      |           |      |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Date of Excavation: 10/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 89.3<br>Coordinates: 433018E - 409781N                                                                | Groundwater:<br>Groundwater not encountered.                                         |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Trial pit terminated on concrete at 2.2m bgl. |

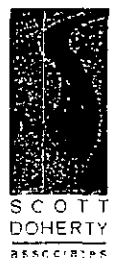
  

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|-------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP12A | TRIAL PIT RECORD      | Revision: Final   |
|                         | North Gawber Colliery | Project No. 07053 |



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DOHERTY  
ASSOCIATES

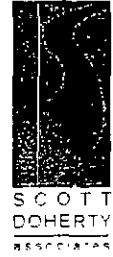
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| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                               |                              |                      | Samples                                                                           |                   | Tests     |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------------------------------------------------------------------------------|-------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                   | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                                                         | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of brown gravelly clay. Gravel is fine to coarse angular to subrounded sandstone, coal, unburnt shale, dolomite, pipes and brick. Cobbles and boulders of sandstone and unburnt shale present also). | (0.30)                       | 89.00                |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               | (0.40)                       | 88.60                |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               | (0.70)                       | 88.60                |                                                                                   |                   |           |      |                                                                                       |
| 2.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of grey fine to coarse gravel of angular and subangular unburnt shale, sandstone and coal).                                                                                                          | (3.10)                       |                      |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               |                              |                      |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               |                              |                      |                                                                                   |                   |           |      |                                                                                       |
| 3.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of clay bound red and black/grey fine to coarse sandy gravel of angular and subangular unburnt shale, burnt shale, bricks, sandstone and coal).                                                      |                              |                      |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               |                              |                      |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               |                              |                      |                                                                                   |                   |           |      |                                                                                       |
| 4.00                                                                                                                                                                                         |  | Firm very friable grey/yellow mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal. Possibly reworked.                                                 |                              |                      |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               |                              |                      |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                               |                              |                      |                                                                                   |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 4.20 m                                                                                                                                                                                                                    |                              |                      |                                                                                   |                   |           |      |                                                                                       |
| Date of Excavation: 10/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 89.3<br>Coordinates: 433018E - 409781N                                                                |                                                                                   |                                                                                                                                                                                                                                               |                              |                      | Groundwater:<br>Groundwater not encountered.                                      |                   |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                               |                              |                      | Remarks:<br>Trial pit sides stable.<br>Concrete to 0.3m bgl in side of trial pit. |                   |           |      |                                                                                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                               | TRIAL PIT RECORD             |                      |                                                                                   | Revision: Final   |           |      |  |
| TP12B                                                                                                                                                                                        |                                                                                   |                                                                                                                                                                                                                                               | North Gawber Colliery        |                      |                                                                                   | Project No. 07053 |           |      |                                                                                       |

Photograph:

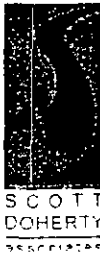
| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                                    |                              |                      | Samples                                     |                   | Tests     |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of grey clayey fine to coarse sandy gravel of angular unburnt shale and coal).                                                                                            | 0.10                         | 90.60                | 0.10                                        | B                 |           |      |                                                                                                                   |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of reddish brown slightly clayey fine to coarse sandy gravel of angular and subangular unburnt shale, burnt shale and coal. Cobbles of shale and siltstone present also). |                              |                      | 1.10                                        | B                 |           |      |                                                                                                                   |
| 2.00                                                                                                                                                                                         |        |                                                                                                                                                                                                                    |                              |                      | 2.20                                        | B                 |           |      |                                                                                                                   |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                                                                                    | (4.40)                       |                      | 3.40                                        | B                 |           |      |                                                                                                                   |
| 4.00                                                                                                                                                                                         |        |                                                                                                                                                                                                                    |                              |                      |                                             |                   |           |      |                                                                                                                   |
|                                                                                                                                                                                              |        | MADE GROUND (Firm and stiff very dark grey sandy slightly gravelly reworked clay. Sand is fine to coarse. Gravel is fine)                                                                                          | 4.50<br>4.60                 | 86.20<br>86.10       | 4.55                                        | B                 | 4.60      |      | 76 / 0 kPa                                                                                                        |
| Continued next sheet                                                                                                                                                                         |        |                                                                                                                                                                                                                    |                              |                      |                                             |                   |           |      |                                                                                                                   |
| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 90.7<br>Coordinates: 433008E - 409803N                                                               |        |                                                                                                                                                                                                                    |                              |                      | Groundwater:<br>Steady seepage at 4.5m bgl. |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                                    |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                                                    | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP13                                                                                                                                                                                         |        |                                                                                                                                                                                                                    | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |      |                                                                                                                   |

Photograph:

| Strata                                                                                                                                                                                       |        |                                              |                              |                      | Samples                                     |                   | Tests     |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
|                                                                                                                                                                                              |        | angular coal).<br>End of Trial Pit at 4.60 m |                              |                      |                                             |                   |           |      |                                                                                       |
| 6.00                                                                                                                                                                                         |        |                                              |                              |                      |                                             |                   |           |      |                                                                                       |
| 7.00                                                                                                                                                                                         |        |                                              |                              |                      |                                             |                   |           |      |                                                                                       |
| 8.00                                                                                                                                                                                         |        |                                              |                              |                      |                                             |                   |           |      |                                                                                       |
| 9.00                                                                                                                                                                                         |        |                                              |                              |                      |                                             |                   |           |      |                                                                                       |
| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 90.7<br>Coordinates: 433008E - 409803N                                                               |        |                                              |                              |                      | Groundwater:<br>Steady seepage at 4.5m bgl. |                   |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                              |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |      |                                                                                       |
| Trial Pit:                                                                                                                                                                                   |        |                                              | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |      |  |
| TP13                                                                                                                                                                                         |        |                                              | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |      |                                                                                       |



Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                    |                              |                       | Samples                                     |                   | Tests     |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------|---------------------------------------------|-------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (m AOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
| 0.10                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of firm dark grey very sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular unburnt shale and coal. Some cobbles of unburnt shale present also). | (3.90)                       |                       | 0.10                                        | B                 |           |      |                                                                                       |
| 1.10                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                    |                              |                       | B                                           |                   |           |      |                                                                                       |
| 2.10                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                    |                              |                       | B                                           |                   |           |      |                                                                                       |
| 3.10                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                    |                              |                       | B                                           |                   |           |      |                                                                                       |
| 3.90                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                    | 3.90                         | 87.10                 | 3.95                                        | B                 | 4.10      |      | 65 / 0 kPa                                                                            |
| 4.00                                                                                                                                                                                         |                                                                                   | 4.00                                                                                                                                                                                                               | 87.00                        | 4.00                  | B                                           |                   |           |      |                                                                                       |
| 4.20                                                                                                                                                                                         |                                                                                   | 4.20                                                                                                                                                                                                               | 86.80                        | 4.00                  | B                                           |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Soft dark brown sandy slightly gravelly reworked clay. Sand is fine to coarse. Gravel is fine to coarse angular unburnt shale).                                                                       |                              |                       |                                             |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   | Firm light grey mottled light brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular                                                                                         |                              |                       |                                             |                   |           |      |                                                                                       |
| Continued next sheet                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                    |                              |                       |                                             |                   |           |      |                                                                                       |
| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 91.0<br>Coordinates: 433063E - 409816N                                                               |                                                                                   |                                                                                                                                                                                                                    |                              |                       | Groundwater:<br>Steady seepage at 3.9m bgl. |                   |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                    |                              |                       | Remarks:<br>Trial pit sides stable.         |                   |           |      |                                                                                       |
| Trial Pit: TP14                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                    | TRIAL PIT RECORD             |                       |                                             | Revision: Final   |           |      |  |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                    | North Gawber Colliery        |                       |                                             | Project No. 07053 |           |      |                                                                                       |

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                         |                              |                      | Samples                                     |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                             | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|                                                                                                                                                                                              |        | and subangular coal, sandstone and shale.<br>End of Trial Pit at 4.20 m |                              |                      |                                             |                   |           |      |                       |
| 6.00                                                                                                                                                                                         |        |                                                                         |                              |                      |                                             |                   |           |      |                       |
| 7.00                                                                                                                                                                                         |        |                                                                         |                              |                      |                                             |                   |           |      |                       |
| 8.00                                                                                                                                                                                         |        |                                                                         |                              |                      |                                             |                   |           |      |                       |
| 9.00                                                                                                                                                                                         |        |                                                                         |                              |                      |                                             |                   |           |      |                       |
| Date of Excavation: 18/09/2007<br>Equipment: JCB 3CX<br>Logged By: LVC<br>Ground Level: 91.0<br>Coordinates: 433063E - 409816N                                                               |        |                                                                         |                              |                      | Groundwater:<br>Steady seepage at 3.9m bgl. |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                         |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |        |                                                                         | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |      |                       |
| TP14                                                                                                                                                                                         |        |                                                                         |                              |                      |                                             | Project No. 07053 |           |      |                       |
|                                                                                                                                                                                              |        |                                                                         | North Gawber Colliery        |                      |                                             |                   |           |      |                       |



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                              |                              | Samples              |           | Tests |           |             |                       |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|-------|-----------|-------------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type  | Depth (m) | MEXE        | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of reddish brown clay bound fine to coarse sandy gravel of subangular coal, burnt shale, unburnt shale and sandstone).                                                              | (2.10)                       |                      | 0.20      | ES    |           |             |                       |
| 1.20      |                                                                                   |                                                                                                                                                                                                                              |                              |                      | ES        |       |           |             |                       |
| 2.00      |  | MADE GROUND (Colliery discard consisting of firm very dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular coal, unburnt shale and timber. Strong organic odour detected). | 2.10                         | 78.20                | 2.20      | ES    | 2.50      |             | 65 / 17 kPa           |
| 2.80      |                                                                                   |                                                                                                                                                                                                                              |                              |                      |           |       |           | 69 / 19 kPa |                       |
| 3.00      |  | Stiff grey mottled orange slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium subangular sandstone and shale.                                                                                    | (0.40)                       | 77.30                | 3.20      | ES    | 3.30      |             | 127 / 38 kPa          |
| 3.40      |                                                                                   |                                                                                                                                                                                                                              |                              |                      |           |       |           |             |                       |
| 4.00      |                                                                                   | End of Trial Pit at 3.40 m                                                                                                                                                                                                   |                              |                      |           |       |           |             |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 80.3<br>Coordinates: 432912E - 409668N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|                        |                       |                   |
|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP15 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



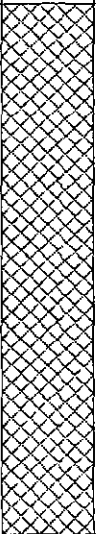
SCOTT  
DOHERTY  
ASSOCIATES

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                                                             |                              |                      | Samples                                      |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                                                                 | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of black clayey, very clayey in places, silty fine to coarse sand. Ash, metal bars and plywood boards present also).                                                                               | (1.10)                       |                      | 0.30                                         | ES                |           |      |                       |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                             | 1.10                         | 77.90                | 1.00                                         | B                 |           |      |                       |
| 2.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of stiff grey and brown sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular brick, coal and sandstone).                                                   | (0.80)                       |                      | 1.30                                         | ES                | 1.30      |      | 140 / 41 kPa          |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                             | 1.90                         | 77.10                | 1.80                                         | B                 |           |      |                       |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                             | (0.80)                       |                      | 2.00                                         | B                 |           |      |                       |
| 3.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of red and grey clay bound fine to coarse sandy gravel. Gravel is angular and subangular ash, burnt shale, unburnt shale, coal and sandstone. Cobbles of coal and sandstone present also).         | 2.70                         | 76.30                | 2.10                                         | ES                |           |      |                       |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                             | (0.80)                       |                      | 3.00                                         | ES                |           |      |                       |
| 4.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of grey clay bound fine to coarse sand and gravel. Gravel is predominantly angular and subangular unburnt shale with coal, sandstone and timber fragments. Cobbles of unburnt shale present also). | 3.50                         | 75.50                |                                              | B                 |           |      |                       |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                             | (0.40)                       |                      | 3.60                                         | B                 | 3.60      |      | 68 / 17 kPa           |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                             | 3.90                         | 75.10                | 3.80                                         | ES                | 3.80      |      | 70 / 12 kPa           |
|                                                                                                                                                                                              |        | MADE GROUND (Reworked glacial till consisting of firm grey and light brown, sometimes mottled black, sandy gravelly clay. Sand is fine to coarse. Gravel is fine and medium angular to subrounded sandstone with some coal).                |                              |                      |                                              |                   |           |      |                       |
| End of Trial Pit at 3.90 m                                                                                                                                                                   |        |                                                                                                                                                                                                                                             |                              |                      |                                              |                   |           |      |                       |
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 79.0<br>Coordinates: 432903E - 409636N                                                         |        |                                                                                                                                                                                                                                             |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                                                             |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                                                                             | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      |                       |
| TP16                                                                                                                                                                                         |        |                                                                                                                                                                                                                                             | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                       |



Photograph:

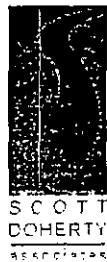
| Strata    |                                                                                   |                                                                                                                                                                                                                                                    |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 0.00      |  | MADE GROUND (Colliery discard consisting of grey, with some orange staining, clayey, very clayey in places, fine to coarse sandy gravel. Gravel is subangular unburnt shale and mudstone. Occasional cobbles of sandstone present after 2.5m bgl). | (3.60)                       |                      | 0.20      | ES   |           |      |                       |
| 1.00      |                                                                                   |                                                                                                                                                                                                                                                    |                              |                      | 1.20      | ES   |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                    |                              |                      | 2.00      | B    |           |      |                       |
| 2.30      |                                                                                   |                                                                                                                                                                                                                                                    |                              |                      | 2.30      | ES   |           |      |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                    |                              |                      | 3.30      | ES   |           |      |                       |
| 3.60      |                                                                                   | End of Trial Pit at 3.60 m                                                                                                                                                                                                                         | 3.60                         | 76.60                |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                    |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 80.2<br>Coordinates: 432974E - 409655N                                                         | Groundwater:<br>Steady seepage at 2.7m bgl and at 3.2m bgl. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.                         |

|            |                       |                   |
|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP17       | North Gawber Colliery | Project No. 07053 |



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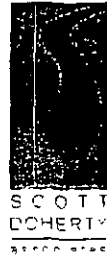
Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                    |                              |                      | Samples   |         | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| - 1.00    |  | MADE GROUND (Colliery discard consisting of greyish brown clay bound fine to coarse gravel of subangular unburnt shale).                                                                                           | (0.50)                       | 74.40                | 0.20      | ES      |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of black very clayey silty fine to coarse slightly gravelly sand. Gravel is subangular burnt shale. Organic odour detected).                                              | (0.80)                       |                      | 0.70      | ES      |           |      |                       |
|           |                                                                                   | MADE GROUND (Stiff friable grey, mottled orange in places, sandy gravelly reworked clay. Sand is fine to coarse. Gravel is fine and medium angular and subangular unburnt shale).                                  | (0.45)                       | 73.80                | 1.50      | ES<br>B | 1.50      |      | 90 / 48 kPa           |
| - 2.00    |  |                                                                                                                                                                                                                    | 1.25                         | 73.15                | 2.00      | B<br>ES | 2.00      |      | 92 / 48 kPa           |
|           |                                                                                   | Stiff grey mottled orange sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular coal, mudstone and sandstone. Occasional cobbles of sandstone present also. Slight organic odour detected. | (1.45)                       |                      |           |         |           |      |                       |
| - 3.00    |  |                                                                                                                                                                                                                    |                              |                      | 3.00      | B<br>ES | 3.00      |      | 72 / 41 kPa           |
|           |                                                                                   | End of Trial Pit at 3.20 m                                                                                                                                                                                         | 3.20                         | 71.70                |           |         |           |      |                       |
| - 4.00    |                                                                                   |                                                                                                                                                                                                                    |                              |                      |           |         |           |      |                       |

|                                                                                                                                                                                              |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 74.9<br>Coordinates: 432967E - 409594N                                                         | Groundwater:<br>Groundwater not encountered |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.         |

|                        |                       |                   |                                                                                       |
|------------------------|-----------------------|-------------------|---------------------------------------------------------------------------------------|
| Trial Pit:<br><br>TP18 | TRIAL PIT RECORD      | Revision: Final   |  |
|                        | North Gawber Colliery | Project No. 07053 |                                                                                       |

Photograph:

| Strata    |        |                                                                                                                                                                                                                                     |                              |                      | Samples   |         | Tests     |      |                       |
|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m) | Legend | Description                                                                                                                                                                                                                         | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |        | MADE GROUND (Colliery discard consisting of dark grey and brown clay bound fine to coarse sandy gravel. Gravel is subangular coal, burnt shale, unburnt shale and mudstone).                                                        | (1.10)                       |                      | 0.20      | ES      |           |      |                       |
|           |        |                                                                                                                                                                                                                                     | 1.10                         | 77.10                | 1.00      | B       |           |      |                       |
| 2.00      |        | MADE GROUND (Colliery discard consisting of red clayey fine to coarse sandy gravel of angular and subangular burnt shale and sandstone. Some cobbles of sandstone present also).                                                    | (1.50)                       |                      | 1.50      | ES      |           |      |                       |
|           |        |                                                                                                                                                                                                                                     | 2.60                         | 75.80                | 2.00      | B       |           |      |                       |
| 3.00      |        | MADE GROUND (Colliery discard consisting of red and grey clay bound fine to coarse sandy gravel. Gravel is angular and subangular unburnt shale and sandstone. Some cobbles of sandstone and occasional broken brick present also). | (0.70)                       |                      | 3.00      | B<br>ES |           |      |                       |
|           |        |                                                                                                                                                                                                                                     | 3.30                         | 74.90                | 3.40      | B<br>ES | 3.50      |      | 48 / 25 kPa           |
| 4.00      |        | MADE GROUND (Firm dark grey with very dark grey patches sandy gravelly, possibly reworked, clay. Sand is fine to coarse. Gravel is fine and medium coal, sandstone and mudstone. Organic odour detected).                           | (0.40)                       |                      |           |         |           |      |                       |
|           |        | End of Trial Pit at 3.70 m                                                                                                                                                                                                          | 3.70                         | 74.50                |           |         |           |      |                       |

|                                                                                                                                                                                              |                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 78.2<br>Coordinates: 433015E - 409619N                                                         | Groundwater:<br>Steady seepage at 2.6m bgl. Trial pit wet below 2.6m with water level rising to 3.3m bgl in excavation. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.                                                                                     |

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|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP19       | North Gawber Colliery | Project No. 07053 |



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Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             | Samples              |           | Tests |                   |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------|-----------|-------|-------------------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                                                                                                                                                                                                                                               | Strata Depth (Thickness) (m)                | Reduced Level (mAOD) | Depth (m) | Type  | Depth (m)         | MEXE | Shear Vane (Peak/Res) |
| 0.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of dark grey clayey, very clayey in places, fine to coarse sandy gravel. Gravel is subangular coal, mudstone and sandstone).                                                                                                                                                                                                                                                     | (0.40)                                      | 74.20                | 0.20      | ES    |                   |      |                       |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.40                                        |                      |           |       |                   |      |                       |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of black very clayey silty fine to coarse slightly gravelly sand. Gravel is angular burnt shale and unburnt shale. Organic odour detected).                                                                                                                                                                                                                                      | (1.30)                                      |                      | 1.00      | ES    |                   |      |                       |
| 2.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of soft and firm grey and very dark grey mottled orange slightly sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular unburnt shale with some brick. Occasional timber fragments and pieces of fabric present also. Remnant roots seen at 1.3m bgl. Lenses of clay bound gravel present after 2.0m bgl. Wet below 1.9m bgl. Organic odour detected). | 1.70                                        | 72.90                | 2.00      | ES    | 1.80              |      | 36 / 18 kPa           |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                                                                                                                                                                                                           | (1.30)                                      |                      | 2.50      | B     |                   |      |                       |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.00                                        | 71.60                | 3.00      | ES    |                   |      |                       |
| 4.00                                                                                                                                                                                         |        | End of Trial Pit at 3.00 m                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                      |           |       |                   |      |                       |
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 74.6<br>Coordinates: 433013E - 409564N                                                         |        |                                                                                                                                                                                                                                                                                                                                                                                                                           | Groundwater:<br>Steady seepage at 1.9m bgl. |                      |           |       |                   |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                                                                                                                                                                                                                                           | Remarks:<br>Trial pit sides stable.         |                      |           |       |                   |      |                       |
| Trial Pit: TP20                                                                                                                                                                              |        |                                                                                                                                                                                                                                                                                                                                                                                                                           | TRIAL PIT RECORD                            |                      |           |       | Revision: Final   |      |                       |
|                                                                                                                                                                                              |        |                                                                                                                                                                                                                                                                                                                                                                                                                           | North Gawber Colliery                       |                      |           |       | Project No. 07053 |      |                       |



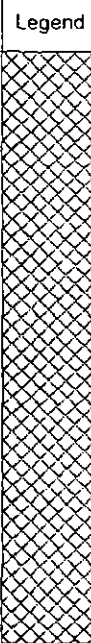


Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                          |                              | Samples                                     |           | Tests   |                       |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------|-----------|---------|-----------------------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                              | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                        | Depth (m) | Type    | Depth (m)             | MEXE | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of grey/black fine to coarse gravel of angular and subangular unburnt shale, sandstone, bricks, slag and coal)                                  | (3.30)                       |                                             | 1.00      | ES      |                       |      |                       |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
| 3.30                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
|                                                                                                                                                                                              |  | MADE GROUND (Colliery discard consisting of red fine to coarse sandy gravel of angular and subangular burnt shale with inclusions of firm red mottled brown/yellow sandy gravelly clay). | (0.70)                       |                                             | 3.40      | ES      | 3.40                  |      | 65 / 0 kPa            |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
|                                                                                                                                                                                              |  | Stiff grey/yellow mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal.                           | (0.20)                       |                                             | 4.00      | B<br>ES | 4.00                  |      | 84 / 0 kPa            |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
| End of Trial Pit at 4.20 m                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         |                       |      |                       |
| Date of Excavation: 10/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 81.5<br>Coordinates: 433131E - 409648N                                                                |                                                                                   |                                                                                                                                                                                          |                              | Groundwater:<br>Groundwater not encountered |           |         |                       |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                          |                              | Remarks:<br>Trial pit sides stable          |           |         |                       |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                          | TRIAL PIT RECORD             |                                             |           |         | Revision: Final       |      |                       |
| TP21                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                          |                              |                                             |           |         | North Gawber Colliery |      |                       |



Photograph:

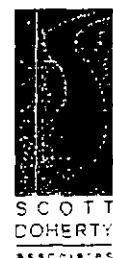
| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                    |                              |                      | Samples                                     |                   | Tests     |             |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|-------------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE        | Shear Vane (Peak/Res)                                                                                             |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of soft very dark grey silt. Pieces of metal and timber present at 0.6m bgl. Strong organic odour detected).              |                              |                      | 0.50                                        | ES<br>B           |           |             |                                                                                                                   |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                    | (4.00)                       |                      | 2.00                                        | B<br>ES           |           |             |                                                                                                                   |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                    |                              |                      |                                             |                   |           |             |                                                                                                                   |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                    |                              |                      |                                             |                   |           |             |                                                                                                                   |
|                                                                                                                                                                                              |  | MADE GROUND (Stiff brown sandy gravelly reworked clay. Sand is fine to coarse. Gravel is fine and medium subangular sandstone and coal. Remnant rootlets present). | 4.00                         | 77.60                | 4.00                                        | B<br>ES           |           |             |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                    | 4.20                         | 77.40                |                                             |                   | 4.10      | 89 / 25 kPa |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                    | (0.40)                       |                      |                                             |                   | 4.40      | 93 / 21 kPa |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                    | 4.60                         | 77.00                |                                             |                   |           |             |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   | Stiff grey mottled brown and orange slightly                                                                                                                       |                              |                      |                                             |                   |           |             |                                                                                                                   |
| Continued next sheet                                                                                                                                                                         |                                                                                   |                                                                                                                                                                    |                              |                      |                                             |                   |           |             |                                                                                                                   |
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 81.6<br>Coordinates: 433172E - 409616N                                                         |                                                                                   |                                                                                                                                                                    |                              |                      | Groundwater:<br>Slight seepage at 3.9m bgl. |                   |           |             |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                    |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |             |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                    | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |             | <br>SCOTT DOHERTY ASSOCIATES |
| TP22                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                    | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |             |                                                                                                                   |

Photograph:

| Strata    |        |                                                                                                                  |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|--------|------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend | Description                                                                                                      | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|           |        | sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine angular coal.<br>End of Trial Pit at 4.60 m |                              |                      |           |      |           |      |                       |
| 6.00      |        |                                                                                                                  |                              |                      |           |      |           |      |                       |
| 7.00      |        |                                                                                                                  |                              |                      |           |      |           |      |                       |
| 8.00      |        |                                                                                                                  |                              |                      |           |      |           |      |                       |
| 9.00      |        |                                                                                                                  |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 81.6<br>Coordinates: 433172E - 409516N                                                         | Groundwater:<br>Slight seepage at 3.9m bgl. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.         |

|                        |                                               |                                          |
|------------------------|-----------------------------------------------|------------------------------------------|
| Trial Pit:<br><br>TP22 | TRIAL PIT RECORD<br><br>North Gawber Colliery | Revision: Final<br><br>Project No. 07053 |
|------------------------|-----------------------------------------------|------------------------------------------|



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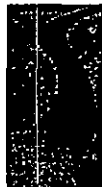
Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                    |                              |                      | Samples                                     |                   | Tests     |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
| 0.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of very dark grey fine to coarse sandy gravel of angular and subangular ash, clinker and some coal. Rare cobbles of whole brick present). | (3.80)                       |                      | 0.30                                        | ES                |           |      |                                                                                                                   |
| 1.50                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                    |                              |                      | B<br>ES                                     |                   |           |      |                                                                                                                   |
| 2.50                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                    |                              |                      | ES                                          |                   |           |      |                                                                                                                   |
| 3.50                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                    |                              |                      | ES                                          |                   |           |      |                                                                                                                   |
| 3.80                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                    | 3.80                         | 78.20                |                                             |                   |           |      |                                                                                                                   |
| 4.00                                                                                                                                                                                         |  | Stiff grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine angular coal. Organic odour detected.                                                              | (0.40)                       |                      | 4.00                                        | ES<br>B           | 4.10      |      | 97 / 18 kPa                                                                                                       |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 4.20 m                                                                                                                                                         | 4.20                         | 77.80                |                                             |                   |           |      |                                                                                                                   |
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 82.0<br>Coordinates: 433204E - 409637N                                                         |                                                                                   |                                                                                                                                                                                    |                              |                      | Groundwater:<br>Slight seepage at 3.8m bgl. |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                    |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                    | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP23                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                    | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |      |                                                                                                                   |

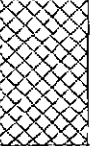
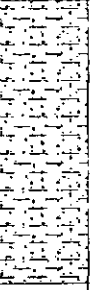
Photograph:

| Strata                                                                                                                                                                                       |                                                                                                                                                           |                                                                                                                                                                                                      |                              |                      | Samples                                      |                   | Tests     |      |                                                                                                                         |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------------|-------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                                                                                                    | Description                                                                                                                                                                                          | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                                   |             |
| 0.00<br>1.00                                                                                                                                                                                 |                                                                          | MADE GROUND (Reinforced concrete road).                                                                                                                                                              | 0.20                         | 80.50                | 0.20                                         | ES                |           |      |                                                                                                                         |             |
|                                                                                                                                                                                              |                                                                                                                                                           | MADE GROUND (Colliery discard consisting of grey clayey fine to coarse sandy gravel of angular and subangular unburnt shale, coal and brick).                                                        | 0.40                         | 80.30                | 0.60                                         | ES                |           |      |                                                                                                                         |             |
|                                                                                                                                                                                              |                                                                                                                                                           | MADE GROUND (Colliery discard consisting of red fine to coarse subangular gravel of burnt shale. Many cobbles of burnt shale present also).                                                          | 0.60                         | 80.10                | 1.00                                         | ES                |           |      |                                                                                                                         |             |
|                                                                                                                                                                                              |                                                                                                                                                           | MADE GROUND (Colliery discard consisting of dark grey fine to coarse gravel of angular and subangular coal, unburnt shale and rare ceramic. Cobbles of unburnt shale and whole bricks present also). | (2.00)                       |                      |                                              |                   |           |      |                                                                                                                         |             |
| 2.00                                                                                                                                                                                         |                                                                                                                                                           |                                                                                                                                                                                                      | 2.60                         | 78.10                | 3.20                                         | ES                | 2.70      |      | 68 / 32 kPa                                                                                                             |             |
|                                                                                                                                                                                              | MADE GROUND (Firm dark grey mottled brown sandy gravelly reworked clay. Sand is fine to coarse. Gravel is fine and medium subangular coal and sandstone). | 2.80                                                                                                                                                                                                 | 77.80                        |                      |                                              |                   |           |      |                                                                                                                         |             |
| 3.00                                                                                                                                                                                         |                                                                                                                                                           | (0.40)                                                                                                                                                                                               |                              | 3.00                 |                                              |                   |           |      |                                                                                                                         | 74 / 22 kPa |
|                                                                                                                                                                                              | Stiff grey mottled orange sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular and subangular coal and sandstone.                | 3.20                                                                                                                                                                                                 | 77.50                        |                      |                                              |                   |           |      |                                                                                                                         |             |
| 4.00                                                                                                                                                                                         |                                                                                                                                                           | End of Trial Pit at 3.20 m                                                                                                                                                                           |                              |                      |                                              |                   |           |      |                                                                                                                         |             |
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 80.7<br>Coordinates: 433239E - 409614N                                                         |                                                                                                                                                           |                                                                                                                                                                                                      |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                                                                                                                         |             |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                                                                                           |                                                                                                                                                                                                      |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                                                                                                                         |             |
| Trial Pit:                                                                                                                                                                                   |                                                                                                                                                           |                                                                                                                                                                                                      | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      | <br>SCOTT<br>DOHERTY<br>ASSOCIATES |             |
| TP24                                                                                                                                                                                         |                                                                                                                                                           |                                                                                                                                                                                                      | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                                                                                                                         |             |

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                |                              | Samples                                      |           | Tests             |           |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-----------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                    | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                         | Depth (m) | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Reinforced concrete).                                                                                                                                             | 0.20                         | 79.10                                        | 1.00      | ES<br>B           |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Gravel of dolomite, sub-base materials).                                                                                                                          | 0.40                         | 78.90                                        |           |                   |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of black/grey fine to coarse sandy gravel of angular and subangular brick, cables, unburnt shale, sandstone and much coal).           |                              |                                              |           |                   |           |      |                                                                                                                   |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                | (3.20)                       |                                              |           |                   |           |      |                                                                                                                   |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                |                              |                                              |           |                   |           |      |                                                                                                                   |
| 4.00                                                                                                                                                                                         |  | Firm friable grey/yellow mottled brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal. | 3.60                         | 75.70                                        | 4.00      | ES<br>B           |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                | (0.50)                       |                                              |           |                   |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                | 4.10                         | 75.20                                        |           |                   |           |      |                                                                                                                   |
| End of Trial Pit at 4.10 m                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                |                              |                                              |           |                   |           |      |                                                                                                                   |
| Date of Excavation: 05/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 79.3<br>Coordinates: 433175E - 409583N                                                                |                                                                                   |                                                                                                                                                                                |                              | Groundwater:<br>Groundwater not encountered. |           |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                |                              | Remarks:<br>Trial pit sides stable.          |           |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                | TRIAL PIT RECORD             |                                              |           | Revision: Final   |           |      | <br>SCOTT DOHERTY<br>RECORDS |
| TP25                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                | North Gawber Colliery        |                                              |           | Project No. 07053 |           |      |                                                                                                                   |

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | Samples                                    |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|--------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                  | Type              | Depth (m) | MEXE | Shear Vane (Feat/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of grey red and brown clay bound fine to coarse sandy gravel of angular and subangular burnt shale, sandstone and brick. Cobbles of whole and broken brick and sandstone present also).                      | 1.20                         | 76.10                | 0.20                                       | ES                |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | 0.50                                       | B                 |           |      |                       |
| 2.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of dark brown and dark grey fine to coarse sandy gravel of subangular unburnt shale, coal, rare slate and rare glass. Metal plates, clay pipe fragments and cobbles and boulders of sandstone present also). | 2.20                         | 75.10                | 1.50                                       | ES                |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | 2.00                                       | B                 |           |      |                       |
| 3.00                                                                                                                                                                                         |  | Stiff wet grey and brown slightly sandy gravelly CLAY. Sand is fine and medium. Gravel is fine to coarse subangular coal and sandstone.                                                                                                               | 3.90                         | 73.20                |                                            |                   | 2.60      |      | 92 / 43 kPa           |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | 3.00                                       | B<br>ES           |           |      |                       |
| 4.00                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                       | 4.10                         | 73.20                |                                            |                   | 3.40      |      | 107 / 33 kPa          |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | 3.90                                       | B<br>ES           |           |      |                       |
| End of Trial Pit at 4.10 m                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      |                                            |                   |           |      |                       |
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 77.3<br>Coordinates: 433218E - 409572N                                                         |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | Groundwater:<br>Slight seepage at 3.2m bgl |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                                       |                              |                      | Remarks:<br>Trial pit sides stable.        |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                       | TRIAL PIT RECORD             |                      |                                            | Revision: Final   |           |      |                       |
| TP26                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                       | North Gawber Colliery        |                      |                                            | Project No. 07053 |           |      |                       |



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                    | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 0.00      |  | MADE GROUND (Colliery discard consisting of red and brown fine to coarse sandy gravel of subangular burnt shale, unburnt shale and coal).                      | (1.30)                       |                      | 0.20      | ES   |           |      |                       |
| 1.00      |                                                                                   |                                                                                                                                                                |                              |                      |           |      |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                |                              |                      |           |      |           |      |                       |
| 3.00      |                                                                                   | MADE GROUND (Colliery discard consisting of dark grey clay bound fine to coarse sandy gravel of angular and subangular unburnt shale, mudstone and rare coal). | (1.80)                       | 73.00                | 1.50      | ES   |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                |                              |                      |           |      |           |      |                       |
|           |                                                                                   | End of Trial Pit at 3.10 m                                                                                                                                     | 3.10                         | 71.20                | 3.00      | ES   |           |      |                       |

|                                                                                                                                                                                              |                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 74.3<br>Coordinates: 433092E - 409554N                                                         | Groundwater:<br>Steady seepage at 2.1m bgl.   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Repeated collapse after 1.5m bgl. |

|                        |                                                      |                                          |
|------------------------|------------------------------------------------------|------------------------------------------|
| Trial Pit:<br><br>TP27 | <b>TRIAL PIT RECORD</b><br><br>North Gawber Colliery | Revision: Final<br><br>Project No. 07053 |
|------------------------|------------------------------------------------------|------------------------------------------|



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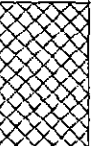
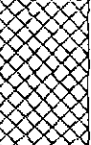
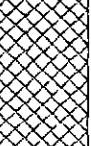
Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      | Samples                                      |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Grey and brown cobbles and coarse subangular gravel of sandstone).                                                                                                                                                                                       | 0.10                         | 73.40                | 0.50                                         | B<br>ES           | 0.80      |      | 67 / 35 kPa           |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of firm friable grey mottled orange sandy gravelly reworked clay. Sand is fine. Gravel is fine to coarse angular and subangular coal, burnt shale, unburnt shale and brick. Cobbles of whole and broken brick present also). | (0.90)                       |                      |                                              |                   |           |      |                       |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of grey clay bound gravel of fine to coarse subangular unburnt shale and coal. Metal bars, pieces of timber and cobbles of sandstone present also. Organic odour detected).                                                  | 1.00                         | 72.50                |                                              |                   |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                       | (0.80)                       |                      |                                              |                   |           |      |                       |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of grey clay bound gravel of fine to coarse subangular unburnt shale and coal. Metal bars, pieces of timber and cobbles of sandstone present also. Organic odour detected).                                                  | 1.80                         | 71.70                |                                              |                   |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                       | (0.40)                       |                      |                                              |                   |           |      |                       |
| 2.00                                                                                                                                                                                         |  | MADE GROUND (Soft and firm grey and brown slightly gravelly clay. Gravel is fine and medium subangular and subrounded sandstone and mudstone. Organic odour detected).                                                                                                | 2.20                         | 71.30                | 2.00                                         | B                 |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                       | (0.50)                       |                      |                                              |                   |           |      |                       |
| 3.00                                                                                                                                                                                         |  | MADE GROUND (Firm friable grey mottled orange sandy gravelly, possibly reworked, clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale and sandstone. Remnant rooflets present. Slight organic odour detected).                 | 2.70                         | 70.80                | 2.60                                         | B<br>ES           | 2.60      |      | 82 / 31 kPa           |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                       | (1.20)                       |                      |                                              |                   |           |      |                       |
| 4.00                                                                                                                                                                                         |  | MADE GROUND (Stiff friable light grey mottled brown sandy gravelly, possibly reworked, clay. Sand is fine and medium. Gravel is fine to coarse subangular unburnt shale and rare coal).                                                                               | 3.90                         | 69.60                | 3.50                                         | ES                | 3.80      |      | 75 / 20 kPa           |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      |                                              |                   |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                       | End of Trial Pit at 3.90 m   |                      |                                              |                   |           |      |                       |
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 73.5<br>Coordinates: 433116E - 409525N                                                         |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                                       | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      |                       |
| TP28                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      |                                              | Project No. 07053 |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                       | North Gawber Colliery        |                      |                                              |                   |           |      |                       |



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Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                                                                       | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of dark brown clay bound fine to coarse sandy gravel. Gravel is angular and subangular burnt shale and unburnt shale. Whole bricks and metal bars present also).                                                                                                         | (1.00)                       |                      | 0.50      | B ES |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                                                                                                   | 1.00                         | 71.00                |           |      |           |      |                       |
| 2.00      |  | MADE GROUND (Colliery discard consisting of stiff grey mottled brown, becoming dark brown with depth, sandy gravelly clay. Sand is fine to coarse. Gravel is fine and medium angular and subangular coal, unburnt shale, sandstone and, after 2.7m bgl, burnt shale. Wet after 2.6m bgl. Organic odour detected). | (2.40)                       |                      | 1.50      | B ES | 1.40      |      | 108 / 42 kPa          |
|           |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                              |                      |           |      |           |      |                       |
| 3.00      |  |                                                                                                                                                                                                                                                                                                                   |                              |                      | 2.50      | B ES | 2.20      |      | 92 / 30 kPa           |
|           |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                              |                      |           |      |           |      |                       |
| 4.00      |  | Soft wet dark grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine angular coal and sandstone.                                                                                                                                                                                                        | (0.60)                       |                      | 3.50      | B ES | 3.50      |      | 32 / 10 kPa           |
|           |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                              |                      |           |      |           |      |                       |
|           |                                                                                   | End of Trial Pit at 4.00 m                                                                                                                                                                                                                                                                                        | 4.00                         | 68.00                |           |      |           |      |                       |

|                                                                                                                                      |                                             |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 19/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 72.0<br>Coordinates: 433062E - 409509N | Groundwater:<br>Steady seepage at 2.6m bgl. |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|

|                                                                                                                                                                                              |                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Repeated collapse after 1.6m bgl. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|

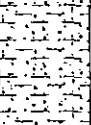
  

|                        |                       |                   |
|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP29 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



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Photograph:

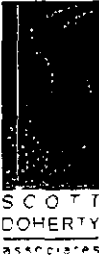
| Strata    |                                                                                   |                                                                                                                                                                                                                                   |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                       | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of grey and brown clay bound fine to coarse sandy gravel of angular and subangular unburnt shale, coal and brick. Cobbles of sandstone, pieces of plastic and rubber pipe present also). | (0.50)                       |                      | 0.20      | ES   |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                   | 0.50                         | 70.60                |           |      |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of stiff grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular unburnt shale, coal and mudstone).                                                        | (0.80)                       |                      | 1.00      | ES   | 1.10      |      | 104 / 26 kPa          |
|           |                                                                                   |                                                                                                                                                                                                                                   | 1.30                         | 69.80                | 1.35      | ES   |           |      |                       |
| 2.00      |  | MADE GROUND (Stiff grey mottled brown sandy gravelly reworked clay. Sand is fine to coarse. Gravel is fine and medium angular to subrounded coal and sandstone).                                                                  | 1.40                         | 69.70                | 1.50      | ES   | 1.60      |      | 98 / 36 kPa           |
|           |                                                                                   |                                                                                                                                                                                                                                   |                              |                      |           |      |           |      |                       |
|           |                                                                                   | Stiff grey and brown mottled orange sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine angular coal.                                                                                                                     | (2.00)                       |                      | 2.00      | B    |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                   |                              |                      | 2.50      | ES   | 2.70      |      | 82 / 37 kPa           |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                   |                              |                      |           |      |           |      |                       |
|           |                                                                                   | End of Trial Pit at 3.40 m                                                                                                                                                                                                        | 3.40                         | 67.70                | 3.40      | ES   |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                   |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 71.1<br>Coordinates: 433080E - 409490N                                                         | Groundwater:<br>Groundwater not encountered |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.         |

|            |                       |                   |
|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP30       | North Gawber Colliery | Project No. 07053 |



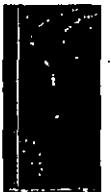
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Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                                        |                              | Samples                                     |           | Tests             |           |      |                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------|-----------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                                            | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                        | Depth (m) | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                                   |
|                                                                                                                                                                                              |        | MADE GROUND (Grey and brown clay bound fine to coarse sand and gravel. Gravel is subangular to rounded sandstone. Cobbles of sandstone present also).                                                                  | 0.50                         | 68.80                                       | 0.20      | ES                |           |      |                                                                                                                         |
| -1.00                                                                                                                                                                                        |        | Stiff grey mottled orange and brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium coal and rare sandstone. Occasional cobbles and rare boulders of sandstone present after 2.5m bgl. |                              |                                             | 1.00      | ES B              | 1.00      |      | 76 / 32 kPa                                                                                                             |
| -2.00                                                                                                                                                                                        |        |                                                                                                                                                                                                                        | (2.70)                       |                                             | 2.00      | ES B              | 2.00      |      | 65 / 28 kPa                                                                                                             |
| -3.00                                                                                                                                                                                        |        |                                                                                                                                                                                                                        | 3.20                         | 66.10                                       | 3.00      | ES                |           |      |                                                                                                                         |
|                                                                                                                                                                                              |        | End of Trial Pit at 3.20 m                                                                                                                                                                                             |                              |                                             |           |                   |           |      |                                                                                                                         |
| -4.00                                                                                                                                                                                        |        |                                                                                                                                                                                                                        |                              |                                             |           |                   |           |      |                                                                                                                         |
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 69.3<br>Coordinates: 433121E - 409439N                                                         |        |                                                                                                                                                                                                                        |                              | Groundwater:<br>Groundwater not encountered |           |                   |           |      |                                                                                                                         |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                                        |                              | Remarks:<br>Trial pit sides stable          |           |                   |           |      |                                                                                                                         |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                                                        | TRIAL PIT RECORD             |                                             |           | Revision Final    |           |      | <br>SCOTT<br>COHERENT<br>GROUP LTD |
| TP31                                                                                                                                                                                         |        |                                                                                                                                                                                                                        | North Gawber Colliery        |                                             |           | Project No. 07053 |           |      |                                                                                                                         |

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      | Samples                                     |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                                                                                                    | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of firm, becoming stiff with depth, friable grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse unburnt shale, sandstone, mudstone and rare burnt shale. Some cobbles of siltstone and rare cobbles of sandstone present also. Slight organic odour detected). | (3.60)                       |                      | 0.20                                        | ES                | 0.90      |      | 52 / 37 kPa           |
| 0.50                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      | B                                           |                   |           |      |                       |
| 1.70                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      | B<br>ES                                     |                   |           |      |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      | B<br>ES                                     |                   |           |      |                       |
| 3.20                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      |                                             |                   |           |      | 108 / 28 kPa          |
| 3.60                                                                                                                                                                                         |                                                                                   | End of Trial Pit at 3.60 m                                                                                                                                                                                                                                                                                                     | 3.60                         | 66.90                |                                             |                   |           |      |                       |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      |                                             |                   |           |      |                       |
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 70.5<br>Coordinates: 433082E - 409388N                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      | Groundwater:<br>Groundwater not encountered |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                                                                                                                |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                                                                                                | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |      |                       |
| TP32                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                                                                | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |      |                       |



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Photograph:

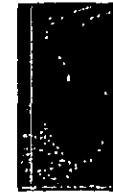
| Strata                       |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      | Samples   |      | Tests     |      |                       |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m)                    | Legend                                                                            | Description                                                                                                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00<br>2.00<br>3.00<br>4.00 |  | MADE GROUND (Colliery discard consisting of dark grey clayey sandy fine to coarse gravel of angular and subangular coal and unburnt shale).                                                                                                                           | 0.90                         | 71.00                | 0.20      | ES   |           |      |                       |
|                              |                                                                                   | MADE GROUND (Colliery discard consisting of firm and stiff friable dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse unburnt shale, sandstone and rare burnt shale. Some pieces of timber present also. Slight organic odour detected). |                              |                      | 1.20      | ES   | 1.80      |      | 64 / 38 kPa           |
|                              |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      | 2.00      | ES   | 2.00      |      | 70 / 20 kPa           |
|                              |                                                                                   |                                                                                                                                                                                                                                                                       |                              |                      | 3.10      | ES   | 2.80      |      | 80 / 30 kPa           |
|                              |                                                                                   | End of Trial Pit at 3.80 m                                                                                                                                                                                                                                            | 3.80                         | 68.10                |           |      |           |      |                       |

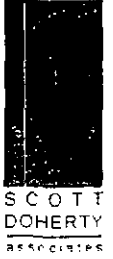
|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 71.9<br>Coordinates: 433043E - 409403N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|                        |                       |                   |
|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP33 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |

  
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Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                                                                         |                                              | Samples              |              | Tests             |           |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------|--------------|-------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                                                                             | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Depth (m)    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of stiff very friable dark grey sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular unburnt shale, sandstone and brick. Cobbles of broken brick and sandstone present also). | (0.90)                                       |                      | 0.20<br>0.40 | ES<br>B           | 0.70      |      | 135 / 21 kPa                                                                          |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of red and brown clay bound fine to coarse gravel of angular burnt shale. Cobbles of burnt shale present also).                                                                                                | (0.25)<br>1.45                               | 72.40<br>72.15       | 1.00         | ES<br>B           |           |      |                                                                                       |
| 2.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of stiff grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale, sandstone and rare burnt shale. Slight organic odour detected).                      | (2.85)                                       |                      | 2.00         | B<br>ES           | 2.80      |      | 91 / 29 kPa                                                                           |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                                                                                                                         |                                              |                      | 3.20         | B<br>ES           |           |      |                                                                                       |
| 4.00                                                                                                                                                                                         |        | End of Trial Pit at 4.00 m                                                                                                                                                                                                                              | 4.00                                         | 69.30                |              |                   |           |      |                                                                                       |
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 73.3<br>Coordinates: 433011E - 409431N                                                         |        |                                                                                                                                                                                                                                                         | Groundwater:<br>Groundwater not encountered. |                      |              |                   |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                                                                         | Remarks:<br>Trial pit sides stable.          |                      |              |                   |           |      |                                                                                       |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                                                                                         | TRIAL PIT RECORD                             |                      |              | Revision: Final   |           |      |  |
| TP34                                                                                                                                                                                         |        |                                                                                                                                                                                                                                                         | North Gawber Colliery                        |                      |              | Project No. 07053 |           |      |                                                                                       |

Photograph:

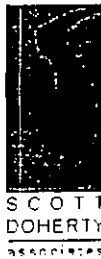
| Strata    |                                                                                   |                                                                                                                                                                                                                                                              |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|           |  | MADE GROUND (Colliery discard consisting of grey very clayey fine to coarse sandy gravel of angular and subangular coal, unburnt shale and brick).                                                                                                           | (0.55)                       |                      | 0.20      | ES   |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                                              | 0.55                         | 72.85                | 0.40      | B    |           |      |                       |
| 1.00      |  | MADE GROUND (Colliery discard consisting of firm grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular unburnt shale and coal. Cobbles of whole and broken brick and clay pipe fragments present also. Damp after 2.0m bgl). | (2.45)                       |                      | 1.00      | ES   | 1.00      |      | 62 / 23 kPa           |
|           |                                                                                   |                                                                                                                                                                                                                                                              |                              |                      | B         |      |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                              |                              |                      |           |      |           |      |                       |
| 2.50      |                                                                                   |                                                                                                                                                                                                                                                              |                              |                      | 2.50      | ES   |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                                              |                              |                      |           | B    | 2.70      |      | 66 / 34 kPa           |
| 3.00      |                                                                                   | MADE GROUND (Yellow coarse gravel of subangular dolomite).                                                                                                                                                                                                   | 3.00                         | 70.50                |           |      |           |      |                       |
|           |                                                                                   | MADE GROUND (Brick and concrete foundations).                                                                                                                                                                                                                |                              |                      |           |      |           |      |                       |
|           |                                                                                   | End of Trial Pit at 3.10 m                                                                                                                                                                                                                                   |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                              |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 73.5<br>Coordinates: 432988E - 409516N                                                         | Groundwater:<br>Groundwater not encountered.                                                                                         |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Trial pit terminated at 3.1m bgl upon refusal on encountering brick and concrete foundations. |

|            |                       |                   |
|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP35       | North Gawber Colliery | Project No. 07053 |



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Photograph:

| Strata    |        |                                                                                                                                                                                                                       |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend | Description                                                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |        | MADE GROUND (Grey fine to coarse sandy gravel of subangular sandstone, unburnt shale and rare ceramic. Cobbles of concrete and sandstone present also).                                                               | (0.70)                       |                      | 0.20      | ES   |           |      |                       |
|           |        |                                                                                                                                                                                                                       | 0.70                         | 73.10                |           |      |           |      |                       |
| 2.00      |        | MADE GROUND (Colliery discard consisting stiff grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale, burnt shale and coal. Pieces of fabric present also). | (1.80)                       |                      | 1.30      | ES   | 1.00      |      | 86 / 22 kPa           |
|           |        |                                                                                                                                                                                                                       |                              |                      |           |      | 1.70      |      | 92 / 15 kPa           |
| 3.00      |        | MADE GROUND (Remnant foundations consisting of brick, concrete and metal bars).                                                                                                                                       | 2.50                         | 71.30                | 2.30      | ES   |           |      |                       |
|           |        |                                                                                                                                                                                                                       | 2.70                         | 71.10                |           |      |           | 2.80 | 84 / 19 kPa           |
| 4.00      |        | MADE GROUND (Colliery discard consisting stiff grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale, burnt shale and coal. Organic odour detected).        | (0.30)                       | 70.80                | 3.10      | ES   |           |      |                       |
|           |        |                                                                                                                                                                                                                       | 3.00                         | 70.50                |           |      |           | 3.40 | 63 / 35 kPa           |
|           |        | MADE GROUND (Firm friable very sandy slightly gravelly reworked clay. Sand is fine to coarse. Gravel is fine and medium subangular coal. Strong organic odour detected).                                              | (0.50)                       |                      | 3.60      | ES   |           |      |                       |
|           |        |                                                                                                                                                                                                                       | 3.80                         | 70.00                |           |      |           |      |                       |
|           |        | MADE GROUND (Firm grey mottled orange sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium subangular and                                                                                  |                              |                      |           |      |           |      |                       |
|           |        | Continued next sheet                                                                                                                                                                                                  |                              |                      |           |      |           |      |                       |

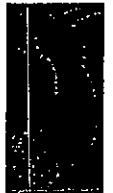
|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 73.8<br>Coordinates: 432955E - 409546N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|                        |                                               |                                          |
|------------------------|-----------------------------------------------|------------------------------------------|
| Trial Pit:<br><br>TP36 | TRIAL PIT RECORD<br><br>North Gawber Colliery | Revision: Final<br><br>Project No. 07053 |
|------------------------|-----------------------------------------------|------------------------------------------|

  
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Photograph:

| Strata                                                                                                                                                                                       |        |                                                              |                              |                      | Samples                                      |                   | Tests     |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
|                                                                                                                                                                                              |        | subrounded coal and sandstone.<br>End of Trial Pit at 3.80 m |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 6.00                                                                                                                                                                                         |        |                                                              |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 7.00                                                                                                                                                                                         |        |                                                              |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 8.00                                                                                                                                                                                         |        |                                                              |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 9.00                                                                                                                                                                                         |        |                                                              |                              |                      |                                              |                   |           |      |                                                                                                                   |
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 73.8<br>Coordinates: 432955E - 409546N                                                         |        |                                                              |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                              |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |        |                                                              | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP36                                                                                                                                                                                         |        |                                                              | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                                                                                                                   |

Photograph:

| Strata    |        |                                                                                                                                                                                                                                               |                                          | Samples                 |              | Tests         |           |      |                                                 |
|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------|--------------|---------------|-----------|------|-------------------------------------------------|
| Depth (m) | Legend | Description                                                                                                                                                                                                                                   | Strata Depth (Thickness) (m)             | Reduced Level (mAOD)    | Depth (m)    | Type          | Depth (m) | MFEX | Shear Vane (F <sub>max</sub> /R <sub>es</sub> ) |
| -1.00     |        | MADE GROUND (Colliery discard consisting of firm very friable dark brown very sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale, burnt shale and coal. Metal bars present also) | (1.50)                                   |                         | 0.20         | ES            | 1.00      |      | 82 / 13 kPa                                     |
| -2.00     |        | MADE GROUND (Colliery discard consisting of stiff grey slightly sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular unburnt shale and mudstone. Slight organic odour detected).                                  | 1.50<br>(0.30)<br>1.80<br>(0.50)<br>2.30 | 72.90<br>72.60<br>72.10 | 1.60<br>2.00 | ES<br>B<br>ES | 1.70      |      | 82 / 24 kPa                                     |
| -3.00     |        | MADE GROUND (Colliery discard consisting of firm black very sandy silt. Sand is fine to coarse. Remnant roots present. Organic odour detected).                                                                                               | (0.60)<br>2.90                           |                         | 2.60         | B<br>ES       | 2.50      |      | 74 / 23 kPa                                     |
| -4.00     |        | MADE GROUND (Stiff brown and grey sandy slightly gravelly, possibly reworked, clay. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded coal and unburnt shale. Slight organic odour detected).                        | (1.00)                                   |                         |              |               | 3.50      |      | 140 / 32 kPa                                    |
|           |        | Stiff grey mottled brown slightly sandy gravelly CLAY. Sand is fine. Gravel is fine and medium shale and rare coal.<br>End of Trial Pit at 3.90 m                                                                                             | 3.90                                     | 70.50                   | 3.90         | ES            |           |      |                                                 |

|                                |  |                             |  |
|--------------------------------|--|-----------------------------|--|
| Date of Excavation: 20/09/2007 |  | Groundwater:                |  |
| Equipment: JCB 3CX             |  | Groundwater not encountered |  |
| Logged By: B. Johnson          |  |                             |  |
| Ground Level: 74.4             |  |                             |  |
| Coordinates: 432909E - 409593N |  |                             |  |

|                                                                                                                                                                                                     |                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>Legend:</b><br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | <b>Remarks:</b><br>Trial pit sides stable |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|

|            |                       |                   |
|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP37       | North Gawber Colliery | Project No. 07053 |

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Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                         |                              |                      | Samples   |         | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                             | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Very soft very dark grey slightly sandy silt. Decomposing roots and branches present down to 0.6m bgl. Strong organic odour detected).                                                     | (1.55)                       |                      | 0.20      | ES      | 0.50      |      | 12 / 8 kPa            |
|           |                                                                                   |                                                                                                                                                                                                         |                              |                      | 0.50      | B       |           |      |                       |
| 2.00      |  | Firm and stiff brown and grey with some orange mottling sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and rounded sandstone. Slight organic odour detected. | (1.05)                       |                      | 1.40      | ES      | 1.80      |      | 61 / 27 kPa           |
|           |                                                                                   |                                                                                                                                                                                                         |                              |                      | 1.70      | B<br>ES |           |      |                       |
| 3.00      |                                                                                   | End of Trial Pit at 2.60 m                                                                                                                                                                              |                              |                      | 2.60      | B<br>ES |           |      | 74 / 35 kPa           |
|           |                                                                                   |                                                                                                                                                                                                         |                              |                      |           |         |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                         |                              |                      |           |         |           |      |                       |

|                                                                                                                                                                                              |                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 74.0<br>Coordinates: 432798E - 409583N                                                         | Groundwater:<br>Slight seepage at 1.3m bgl. Rapid seepage at 2.2m bgl upon encountering field drain. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable                                                                   |

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|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP40 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



SCOTT DOHERTY  
GEOTECHNICAL

Photograph:

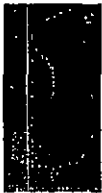
| Strata    |                                                                                   |                                                                                                                                                                                                                |                              | Samples              |           | Tests   |           |      |                       |
|-----------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                    | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of dark brown clayey fine to coarse sandy gravel of angular and subangular unburnt shale, coal, sandstone and mudstone. Occasional fragments of timber present also). | (0.40)                       | 76.30                | 0.20      | ES      | 0.90      |      | 85 / 30 kPa           |
|           |                                                                                   |                                                                                                                                                                                                                | 0.40                         |                      | 0.70      | ES      |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of stiff friable grey very sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded unburnt shale and some burnt shale).      | (0.80)                       |                      | 1.00      | B       |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                | 1.20                         | 75.50                | 1.30      | ES      |           |      |                       |
| 2.00      |  | Stiff, becoming friable after 2.0m bgt, grey mottled brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular sandstone.                                                | (1.60)                       |                      | 1.60      | B       | 1.50      |      | 125 / 31 kPa          |
|           |                                                                                   |                                                                                                                                                                                                                | 2.80                         | 73.90                | 2.60      | B<br>ES |           |      |                       |
| 3.00      |  | Weak grey weathered dark grey and orange very thinly bedded coarse grained SANDSTONE                                                                                                                           | 3.00                         | 73.70                |           |         |           |      |                       |
|           |                                                                                   | End of Trial Pit at 3.00 m                                                                                                                                                                                     |                              |                      |           |         |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                |                              |                      |           |         |           |      |                       |

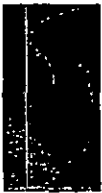
|                                                                                                                                                                                              |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 76.7<br>Coordinates: 432773E - 409652N                                                         | Groundwater:<br>Groundwater not encountered |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.         |

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|------------|-----------------------|------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final  |
| TP42       | North Gawber Colliery | Project No 07053 |

  
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 COHERLY  
 geotechnical

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                             |                              | Samples                                                              |           | Tests             |           |      |                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------|-----------|-------------------|-----------|------|---------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                 | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                                                 | Depth (m) | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                               |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of grey/black clay bound fine to coarse gravel of angular and subangular unburnt shale, sandstone and coal).                                       | (1.30)                       |                                                                      | 1.00      | ES<br>B           |           |      |                                                                                                                     |
| 2.00                                                                                                                                                                                         |                                                                                   | MADE GROUND (Soft and firm grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale and coal).                                       | 1.30                         | 74.60                                                                | 2.00      | ES<br>B           | 2.00      |      | 47 / 0 kPa                                                                                                          |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                             | (2.40)                       |                                                                      |           |                   |           | 3.50 |                                                                                                                     |
| 4.00                                                                                                                                                                                         |                                                                                   | Firm grey/yellow mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal.<br>End of Trial Pit at 3.75 m | 3.70                         | 72.20                                                                |           |                   |           |      |                                                                                                                     |
| Date of Excavation: 10/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 75.9<br>Coordinates: 432781E - 409646N                                                                |                                                                                   |                                                                                                                                                                                             |                              | Groundwater:<br>Slight seepage at 3.2m bgl.                          |           |                   |           |      |                                                                                                                     |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                             |                              | Remarks:<br>Total collapse of trial pit from surface to base of pit. |           |                   |           |      |                                                                                                                     |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                             | TRIAL PIT RECORD             |                                                                      |           | Revision: Final   |           |      | <br>SCOTT DOHERTY<br>ASSOCIATE |
| TP43                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                             | North Gawber Colliery        |                                                                      |           | Project No. 07053 |           |      |                                                                                                                     |

Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                      | Samples   |      | Tests     |             |                       |
|-----------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|-------------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                          | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE        | Shear Vane (Peak/Res) |
| 0.00      |  | MADE GROUND (Colliery discard consisting of firm dark grey and dark brown very sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded unburnt shale, coal, rare burnt shale and rare coal tar. Cobbles of siltstone, pieces of timber, metal plates and plastic sheeting also present. Steel cables noted at 1.7m bgl. Damp after 1.8m bgl. Strong organic odour detected below 1.5m bgl). | (3.60)                       |                      | 0.20      | ES   |           |             |                       |
| 1.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                      | B         | 1.00 |           |             |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                      | ES<br>B   | 2.20 |           | 53 / 28 kPa |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                      | B<br>ES   | 3.20 |           | 64 / 18 kPa |                       |
| 3.60      |                                                                                   | End of Trial Pit at 3.60 m                                                                                                                                                                                                                                                                                                                                                                                                           | 3.60                         | 72.40                |           |      |           |             |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                      |           |      |           |             |                       |

|                                                                                                                                                                                              |                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 76.0<br>Coordinates: 432816E - 409638N                                                         | Groundwater:<br>Groundwater not encountered.  |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Repeated collapse after 3.0m bgl. |

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| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP44       | North Gawber Colliery | Project No. 07053 |

  
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COHERLY  
ASSOCIATES**

Photograph:

| Strata    |        |                                                                                                                                                                                                                                                 |                              | Samples              |           | Tests |           |      |                       |
|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|-------|-----------|------|-----------------------|
| Depth (m) | Legend | Description                                                                                                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type  | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |        | MADE GROUND (Soft and firm very dark grey silty slightly sandy clay. Sand is fine to coarse).                                                                                                                                                   | (0.40)                       | 78.50                | 0.20      | ES    | 0.30      |      | 43 / 20 kPa           |
|           |        | MADE GROUND (Colliery discard consisting of stiff sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular burnt shale, unburnt shale, coal and sandstone. Pieces of timber present also).                         | (0.60)                       |                      | 0.40      | B     |           |      |                       |
|           |        | Stiff grey mottled orange and brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular and subangular sandstone. Becomes friable after 2.0m bgl.                                                                     | 1.00                         | 77.90                | 0.80      | ES    | 0.90      |      | 140 / 39 kPa          |
|           |        |                                                                                                                                                                                                                                                 |                              |                      | 1.20      | ES B  | 1.20      |      | 74 / 24 kPa           |
| 2.00      |        |                                                                                                                                                                                                                                                 | (1.50)                       |                      |           |       |           |      |                       |
| 3.00      |        | Very weak becoming weak grey intensely weathered very thinly bedded coarse grained SANDSTONE.<br><br>Moderately weak and moderately strong grey weathered orange very thinly bedded coarse grained SANDSTONE.<br><br>End of Trial Pit at 2.80 m | 2.50                         | 76.40                | 2.40      | ES    |           |      |                       |
|           |        |                                                                                                                                                                                                                                                 | 2.70                         | 76.20                |           |       |           |      |                       |
|           |        |                                                                                                                                                                                                                                                 | 2.80                         | 76.10                |           |       |           |      |                       |
|           |        |                                                                                                                                                                                                                                                 |                              |                      |           |       |           |      |                       |
| 4.00      |        |                                                                                                                                                                                                                                                 |                              |                      |           |       |           |      |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B. Johnson<br>Ground Level: 78.9<br>Coordinates: 432786E - 409689N                                                        | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable           |

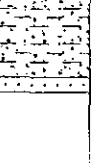
  

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|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP45       | North Gawber Colliery | Project No. 07053 |

SCOTT DOHERTY  
 2000 2000



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                                         |                              | Samples              |           | Tests |           |      |                       |
|-----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|-------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                                             | Strata Depth (Thickness) (m) | Reduced Level (mADD) | Depth (m) | Type  | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| - 1.00    |  | MADE GROUND (Colliery discard consisting of firm very friable dark brown and dark grey very sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone, unburnt shale, mudstone and brick. Some cobbles of sandstone present also). | (1.20)                       |                      | 0.20      | ES    |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                                                                         | 1.20                         | 76.50                | 1.00      | B     | 1.10      |      | 74 / 19 kPa           |
| - 2.00    |  | MADE GROUND (Colliery discard consisting of firm and stiff grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular unburnt shale, mudstone and some brick. Large concrete boulder present at 1.5m bgl. Slight organic odour detected).        | (0.70)                       |                      | 1.40      | ES    | 1.50      |      | 130 / 46 kPa          |
|           |                                                                                   |                                                                                                                                                                                                                                                                                         | 1.90                         | 75.80                | 1.80      | B     |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                                                                         |                              |                      | 2.00      | ES    | 2.10      |      | 71 / 34 kPa           |
|           |                                                                                   |                                                                                                                                                                                                                                                                                         |                              |                      | 2.20      | B     |           |      |                       |
| - 3.00    |  | Stiff grey and brown, sometimes mottled orange, sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded shale and sandstone. Damp.                                                                                                                  | (1.00)                       |                      |           |       | 2.50      |      | 112 / 37 kPa          |
|           |                                                                                   |                                                                                                                                                                                                                                                                                         | 2.90                         | 74.80                | 2.80      | ES    |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                                                                         | 3.00                         | 74.70                |           |       |           |      |                       |
|           |                                                                                   | Moderately strong grey weathered dark grey, very thinly bedded to thinly bedded medium and coarse grained SANDSTONE.                                                                                                                                                                    |                              |                      |           |       |           |      |                       |
|           |                                                                                   | End of Trial Pit at 3.00 m                                                                                                                                                                                                                                                              |                              |                      |           |       |           |      |                       |
| - 4.00    |                                                                                   |                                                                                                                                                                                                                                                                                         |                              |                      |           |       |           |      |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 20/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 77.7<br>Coordinates: 432827E - 409667N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable           |

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| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP46       | North Gawber Colliery | Project No. 07053 |

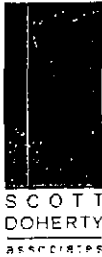


SCOTT  
COCHERY  
a s c o t t c o c h e r y

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                                             |                              | Samples                                                                                                                                                                |           | Tests             |           |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                                 | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                                                                                                                                                   | Depth (m) | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of dark grey/black slightly clayey fine to coarse sandy gravel of angular and subangular unburnt shale, mudstone, coal, ash, slag and clinker).                                                                    | (0.65)                       | 85.15                                                                                                                                                                  | 0.50      | ES B              |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of red and brown fine to coarse sandy gravel of subangular burnt shale, with some cobble and boulder sized fragments).                                                                                             | (1.55)                       |                                                                                                                                                                        | 0.80      | ES B              |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                             |                              |                                                                                                                                                                        | 1.00      |                   |           |      |                                                                                                                   |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                             | 2.20                         | 83.60                                                                                                                                                                  |           |                   |           |      |                                                                                                                   |
| 3.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of firm very friable dark brown and dark grey very sandy very gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone, unburnt shale, mudstone, brick, slag and coal). | (2.40)                       |                                                                                                                                                                        |           |                   |           |      |                                                                                                                   |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                             |                              |                                                                                                                                                                        |           |                   |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                             | 4.60                         | 81.20                                                                                                                                                                  | 4.50      | ES B              |           |      |                                                                                                                   |
| End of Trial Pit at 4.60 m                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                             |                              |                                                                                                                                                                        |           |                   |           |      |                                                                                                                   |
| Date of Excavation: 04/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 85.8<br>Coordinates: 433022E - 409712N                                                                |                                                                                   |                                                                                                                                                                                                                                                             |                              | Groundwater:<br>Groundwater not encountered.                                                                                                                           |           |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                                             |                              | Remarks:<br>Trial pit sides stable.<br>Concrete foundation extends to 1.5m bgl. Geotextile wrapped around the edge of concrete<br>Strata dipping steeply to the south. |           |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                             | TRIAL PIT RECORD             |                                                                                                                                                                        |           | Revision: Final   |           |      | <br>SCOTT DOHERLY ASSOCIATES |
| TP47                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                             | North Gawber Colliery        |                                                                                                                                                                        |           | Project No. 07053 |           |      |                                                                                                                   |

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                              |                              |                      | Samples                                      |                   | Tests     |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mADD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard of grey/black slightly clayey gravelly fine to coarse sand. Gravel is fine to coarse, subangular and subrounded unburnt shale and coal).                                                                       | (0.60)                       | 82.40                | 0.50                                         | ES<br>B           |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of red and black/grey fine to coarse sandy gravel of angular and subangular unburnt shale, burnt shale, sandstone and coal. Some cobbles and boulders of sandstone and unburnt shale present also). | (1.70)                       |                      |                                              |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of red fine to coarse sandy gravel of angular and subangular burnt shale).                                                                                                                          | (2.40)                       |                      |                                              |                   |           |      |                                                                                       |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                              | 2.30                         | 80.70                | 2.00                                         | ES<br>B           |           |      |                                                                                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                              |                              |                      |                                              |                   |           |      |                                                                                       |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                              |                              |                      |                                              |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 4.70 m                                                                                                                                                                                                                   | 4.70                         | 78.30                | 4.50                                         | ES<br>B           |           |      |                                                                                       |
| Date of Excavation: 10/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 83.0<br>Coordinates: 433036E - 409662N                                                                |                                                                                   |                                                                                                                                                                                                                                              |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                              |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                                                                                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                              | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      |  |
| TP48                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                              | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                                                                                       |

Photograph:

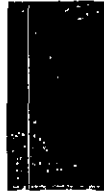
| Strata    |                                                                                   |                                                    |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|----------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|           |  | MADE GROUND (Reinforced concrete, several layers). | (1.00)                       |                      |           |      |           |      |                       |
| 1.00      |                                                                                   | End of Trial Pit at 1.00 m                         | 1.00                         | 85.40                |           |      |           |      |                       |
| 2.00      |                                                                                   |                                                    |                              |                      |           |      |           |      |                       |
| 3.00      |                                                                                   |                                                    |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                    |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Date of Excavation: 08/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 86.4<br>Coordinates: 433069E - 409674N                                                                | Groundwater:<br>Groundwater not encountered.                                         |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Trial pit terminated on concrete foundations. |

|                        |                       |                   |
|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP49 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |

  
**SCOTT DOHERTY ASSOCIATES**

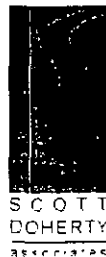
Photograph:

| Strata                     |                                                                                   |                                                                                                                                                                                                                                      |                              |                      | Samples   |         | Tests     |      |                       |
|----------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m)                  | Legend                                                                            | Description                                                                                                                                                                                                                          | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                       |  | MADE GROUND (Colliery discard consisting of dark grey clay bound fine to coarse sandy gravel of angular and subangular burnt shale, mudstone, slag and coal).                                                                        | (0.70)                       |                      | 0.50      | ES<br>B |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                                      | 0.70                         | 86.10                |           |         |           |      |                       |
|                            |                                                                                   | MADE GROUND (Colliery discard consisting of red, brown and yellow slightly clayey fine to coarse sandy gravel of subangular burnt shale, unburnt shale and coal. Occasional cobbles and boulders of sandstone and mudstone present). |                              |                      | 1.00      | ES      |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                                      |                              |                      | 1.50      | B       |           |      |                       |
| 2.00                       |  |                                                                                                                                                                                                                                      |                              |                      |           |         |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                                      |                              |                      |           |         |           |      |                       |
| 3.00                       |  |                                                                                                                                                                                                                                      | (3.50)                       |                      | 2.50      | ES      |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                                      |                              |                      |           |         |           |      |                       |
| 4.00                       |  |                                                                                                                                                                                                                                      |                              |                      |           |         |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                                      |                              |                      |           |         |           |      |                       |
|                            |  | MADE GROUND (Colliery discard consisting of dark grey clay bound fine to coarse gravelly sand. Gravel is angular and subangular unburnt shale, slag, mudstone and coal).                                                             | 4.20                         | 82.60                |           |         |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                                      | (0.50)                       |                      | 4.50      | ES<br>B |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                                      | 4.70                         | 82.10                |           |         |           |      |                       |
| End of Trial Pit at 4.70 m |                                                                                   |                                                                                                                                                                                                                                      |                              |                      |           |         |           |      |                       |

|                                |                                              |
|--------------------------------|----------------------------------------------|
| Date of Excavation: 04/10/2007 | Groundwater:<br>Groundwater not encountered. |
| Equipment: JCB 3CX             |                                              |
| Logged By: CB                  |                                              |
| Ground Level: 86.8             |                                              |
| Coordinates: 433102E - 409681N |                                              |

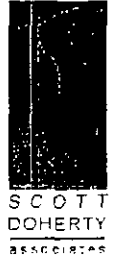
|                                                                                                                                                                                              |                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable. |
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|                        |                                               |                                          |
|------------------------|-----------------------------------------------|------------------------------------------|
| Trial Pit:<br><br>TP50 | TRIAL PIT RECORD<br><br>North Gawber Colliery | Revision: Final<br><br>Project No. 07053 |
|------------------------|-----------------------------------------------|------------------------------------------|



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RECORDS

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |                                                                                                                         | Samples              |           | Tests             |           |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------|-----------|-------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                                           | Strata Depth (Thickness) (m)                                                                                            | Reduced Level (mAOD) | Depth (m) | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of soft very dark grey slightly sandy slightly gravelly silt. Sand is fine. Gravel is fine unburnt shale).                                                                   | (1.05)                                                                                                                  |                      | 0.50      | ES                |           |      |                                                                                       |
|                                                                                                                                                                                              |        | MADE GROUND (Concrete).                                                                                                                                                                                               | 1.05                                                                                                                    | 84.65                |           |                   |           |      |                                                                                       |
| 2.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of red and black/grey fine to coarse sandy gravel of angular and subangular unburnt shale, burnt shale, sandstone and coal. Cobbles and boulders of sandstone present also). | 1.20                                                                                                                    | 84.50                | 2.00      | ES B              |           |      |                                                                                       |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                                                                                       | (3.30)                                                                                                                  |                      |           |                   |           |      |                                                                                       |
| 4.00                                                                                                                                                                                         |        |                                                                                                                                                                                                                       |                                                                                                                         |                      | 4.00      | ES                |           |      |                                                                                       |
|                                                                                                                                                                                              |        | End of Trial Pit at 4.50 m                                                                                                                                                                                            | 4.50                                                                                                                    | 81.20                |           |                   |           |      |                                                                                       |
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 85.7<br>Coordinates: 433134E - 409676N                                                         |        |                                                                                                                                                                                                                       | Groundwater:<br>Groundwater not encountered.                                                                            |                      |           |                   |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                                       | Remarks:<br>Trial pit sides stable.<br>Trial pit carried out in two parts on slope above and below concrete foundation. |                      |           |                   |           |      |                                                                                       |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                                                       | TRIAL PIT RECORD                                                                                                        |                      |           | Revision: Final   |           |      |  |
| TP51                                                                                                                                                                                         |        |                                                                                                                                                                                                                       | North Gawber Colliery                                                                                                   |                      |           | Project No. 07053 |           |      |                                                                                       |

Photograph:

| Strata    |        |                                                                                                                                                                                              |                              |                      | Samples   |         | Tests     |      |                       |
|-----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m) | Legend | Description                                                                                                                                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |        | MADE GROUND (Colliery discard consisting of dark grey clay bound fine to coarse gravel of subangular coal, sandstone, brick and rare glass).                                                 | (0.30)<br>0.30               | 86.50                | 0.20      | ES      |           |      |                       |
|           |        | MADE GROUND (Colliery discard consisting of grey clayey fine to coarse gravel of subangular unburnt shale).                                                                                  | (0.50)<br>0.80<br>0.90       | 86.00<br>85.90       |           |         |           |      |                       |
|           |        | MADE GROUND (Timber beams and metal plate).                                                                                                                                                  | (0.30)<br>1.20               | 85.60                |           |         |           |      |                       |
|           |        | MADE GROUND (Demolition waste consisting of brown fine to coarse gravel of angular and subangular brick, sandstone and unburnt shale. Cobbles of whole and broken brick present also).       | (1.60)                       |                      |           |         |           |      |                       |
| 2.00      |        | MADE GROUND (Colliery discard consisting of grey clay bound fine to coarse gravel of subangular unburnt shale and coal. Some cobbles and rare boulders of sandstone present after 2.0m bgl). | 2.80                         | 84.00                | 1.40      | ES<br>B |           |      |                       |
|           |        | MADE GROUND (Brown and grey fine to coarse gravel of angular and subangular clinker, unburnt shale and burnt shale. Many cobbles of whole brick and some pieces of timber present also).     | 3.00                         | 83.80                |           |         |           |      |                       |
| 3.00      |        | MADE GROUND (Cobbles of red burnt sandstone).                                                                                                                                                | (1.30)                       |                      | 2.40      | B<br>ES |           |      |                       |
|           |        |                                                                                                                                                                                              |                              |                      |           |         |           |      |                       |
| 4.00      |        | End of Trial Pit at 4.30 m                                                                                                                                                                   | 4.30                         | 82.50                |           |         |           |      |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 86.8<br>Coordinates: 433092E - 409707N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

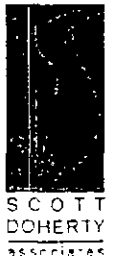
  

|            |                       |                   |
|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP52       | North Gawber Colliery | Project No. 07053 |

  
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Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                      |                                                                                                                   |                      | Samples   |                   | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------|-----------|-------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                          | Strata Depth (Thickness) (m)                                                                                      | Reduced Level (mAOD) | Depth (m) | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|                                                                                                                                                                                              |        | MADE GROUND (Reinforced concrete).                                                                                                                   | 0.20                                                                                                              | 86.80                |           |                   |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of red and brown fine to coarse sandy gravel of subangular burnt shale, unburnt shale, slag, ash and coal). | (0.90)                                                                                                            |                      | 0.50      | ES B              |           |      |                       |
| 1.00                                                                                                                                                                                         |        |                                                                                                                                                      | 1.10                                                                                                              | 85.90                | 1.00      | ES                |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of yellow/grey clay bound fine to coarse gravel of subangular unburnt shale and coal).                      | (0.80)                                                                                                            |                      |           |                   |           |      |                       |
| 2.00                                                                                                                                                                                         |        |                                                                                                                                                      | 1.90                                                                                                              | 85.10                |           |                   |           |      |                       |
|                                                                                                                                                                                              |        | MADE GROUND (Red and black fine to coarse sandy gravel of brick, burnt shale and coal. Inclusions of brown, yellow clay present also).               | (1.60)                                                                                                            |                      | 2.50      | ES                |           |      |                       |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                      |                                                                                                                   |                      |           |                   |           |      |                       |
|                                                                                                                                                                                              |        | End of Trial Pit at 3.50 m                                                                                                                           | 3.50                                                                                                              | 83.50                |           |                   |           |      |                       |
| 4.00                                                                                                                                                                                         |        |                                                                                                                                                      |                                                                                                                   |                      |           |                   |           |      |                       |
| Date of Excavation: 04/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 87.0<br>Coordinates: 433129E - 409691N                                                                |        |                                                                                                                                                      | Groundwater:<br>Groundwater not encountered.                                                                      |                      |           |                   |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                      | Remarks:<br>Trial pit sides stable.<br>Domed yellow brick wall exposed in side of pit at 2.5m bgl to base of pit. |                      |           |                   |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                      | TRIAL PIT RECORD                                                                                                  |                      |           | Revision: Final   |           |      |                       |
| TP53                                                                                                                                                                                         |        |                                                                                                                                                      | North Gawber Colliery                                                                                             |                      |           | Project No. 07053 |           |      |                       |





Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                 |                              |                            | Samples                                      |                   | Tests     |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|----------------------------------------------|-------------------|-----------|------|---------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|----------------------------------|------|-------|------|---------|--|--|--|--|--------|--|--|--|----------------------------|------|-------|--|--|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|----------------------------------------------|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|-------------------------------------|--|--|--|--|------------|--|--|------------------|--|--|-----------------|--|--|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD)       | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of very dark grey clay bound fine to coarse gravel of subangular unburnt shale, coal and rare burnt shale).            | (0.60)                       |                            | 0.20                                         | ES                |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                 | 0.60                         | 87.20                      | 0.70                                         | ES                |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of red fine to coarse gravel of subangular burnt shale).                                                               | (0.40)                       | 88.80                      | 1.20                                         | ES                |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
| 2.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of dark grey clay bound fine to coarse gravel of subangular unburnt shale with many cobbles of whole brick).           | (0.70)                       |                            |                                              |                   |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                 | 1.70                         | 88.10                      | 2.00                                         | ES<br>B           |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
| 3.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of red clayey fine to coarse gravel of subangular burnt shale. Some cobbles and boulders of burnt shale present also). | (1.90)                       |                            |                                              |                   |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                 |                              |                            |                                              |                   |           |      |                                                                                       | 4.00 |  | MADE GROUND (Brick foundations). | 3.60 | 84.20 | 3.50 | ES<br>B |  |  |  |  | (0.40) |  |  |  | End of Trial Pit at 4.00 m | 4.00 | 83.80 |  |  |  |  |  | Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 87.8<br>Coordinates: 433170E - 409681N |  |  |  |  | Groundwater:<br>Groundwater not encountered. |  |  |  |  | Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |  |  |  |  | Remarks:<br>Trial pit sides stable. |  |  |  |  | Trial Pit: |  |  | TRIAL PIT RECORD |  |  | Revision: Final |  |  |
| 4.00                                                                                                                                                                                         |  | MADE GROUND (Brick foundations).                                                                                                                                | 3.60                         | 84.20                      | 3.50                                         | ES<br>B           |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                 | (0.40)                       |                            |                                              |                   |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                 |                              | End of Trial Pit at 4.00 m | 4.00                                         | 83.80             |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 87.8<br>Coordinates: 433170E - 409681N                                                         |                                                                                   |                                                                                                                                                                 |                              |                            | Groundwater:<br>Groundwater not encountered. |                   |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                 |                              |                            | Remarks:<br>Trial pit sides stable.          |                   |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                 | TRIAL PIT RECORD             |                            |                                              | Revision: Final   |           |      |  |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |
| TP54                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                 | North Gawber Colliery        |                            |                                              | Project No. 07053 |           |      |                                                                                       |      |                                                                                   |                                  |      |       |      |         |  |  |  |  |        |  |  |  |                            |      |       |  |  |  |  |  |                                                                                                                                      |  |  |  |  |                                              |  |  |  |  |                                                                                                                                                                                              |  |  |  |  |                                     |  |  |  |  |            |  |  |                  |  |  |                 |  |  |

Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                 |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of very dark grey clay bound fine to coarse gravel of angular and subangular unburnt shale, coal and some sandstone).                                                                  | (0.30)                       | 83.30                | 0.20      | ES   |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of reddish brown clay bound fine to coarse gravel of burnt shale, unburnt shale, coal, brick and rare slag).                                                                           | (0.90)                       |                      | 1.00      | ES   |           |      |                       |
|           |                                                                                   | MADE GROUND (Brick foundations).                                                                                                                                                                                                | 1.20                         | 82.40                |           |      |           |      |                       |
|           |                                                                                   | MADE GROUND (Concrete foundations).                                                                                                                                                                                             | 1.35                         | 82.25                |           |      |           |      |                       |
| 2.00      |  | MADE GROUND (Concrete foundations).                                                                                                                                                                                             | 1.60                         | 82.00                |           |      |           |      |                       |
|           |                                                                                   | MADE GROUND (Concrete foundations).                                                                                                                                                                                             |                              |                      | 2.00      | ES   |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of black/grey fine to coarse sandy gravel of angular and subangular unburnt shale, burnt shale, sandstone and much coal. Cobbles and boulders of mudstone and sandstone present also). | (1.80)                       |                      |           |      |           |      |                       |
| 3.00      |  |                                                                                                                                                                                                                                 | 3.40                         | 80.20                |           |      |           |      |                       |
|           |                                                                                   | Firm friable grey/brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal.                                                                          | (0.60)                       |                      | 3.50      | ES   |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                 | 4.00                         | 79.60                |           |      |           |      |                       |
| 4.00      |                                                                                   | End of Trial Pit at 4.00 m                                                                                                                                                                                                      |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 83.6<br>Coordinates: 433216E - 409659N                                                         | Groundwater:<br>Slight seepage at 3.3m bgl. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.         |

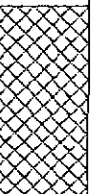
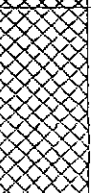
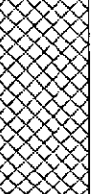
  

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| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP55       | North Gawber Colliery | Project No. 07053 |

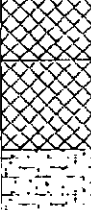


SCOTT  
COHERLY  
DESIGNERS

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                             |                              |                      | Samples                                      |                   | Tests     |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                 | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of grey and red fine to coarse gravel of subangular unburnt and burnt shale).                                                      | (1.30)                       |                      | 0.30                                         | ES                |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                             | 1.30                         | 82.20                | 1.00                                         | B                 |           |      |                                                                                       |
| 2.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of black sandy fine to coarse gravel of angular ash, clinker and some slag. Concrete base and metal pipe present at 2.6-2.8m bgl). |                              |                      | 1.40                                         | ES                |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                             |                              |                      | 1.50                                         | B                 |           |      |                                                                                       |
| 3.00                                                                                                                                                                                         |  |                                                                                                                                                                             | (2.60)                       |                      | 2.50                                         | B<br>ES           |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                             |                              |                      |                                              |                   |           |      |                                                                                       |
| 4.00                                                                                                                                                                                         |  |                                                                                                                                                                             |                              |                      | 3.50                                         | ES                |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                             |                              |                      |                                              |                   |           |      |                                                                                       |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 3.90 m                                                                                                                                                  | 3.90                         | 79.60                |                                              |                   |           |      |                                                                                       |
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 83.5<br>Coordinates: 433155E - 409654N                                                         |                                                                                   |                                                                                                                                                                             |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                             |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                                                                                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                             | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      |  |
| TP56                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                             | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                                                                                       |

Photograph:

| Strata       |                                                                                   |                                                                                                                                                    |                                 | Samples                 |              | Tests   |              | MEXE        | Shear Vane<br>(Peak/Res) |
|--------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------|--------------|---------|--------------|-------------|--------------------------|
| Depth<br>(m) | Legend                                                                            | Description                                                                                                                                        | Strata Depth<br>(Thickness) (m) | Reduced<br>Level (mAOD) | Depth<br>(m) | Type    | Depth<br>(m) |             |                          |
| 1.00         |  | MADE GROUND (Colliery discard consisting of dark grey clay bound fine to coarse gravel of subangular coal, unburnt shale and some burnt shale).    | (1.40)                          |                         | 0.30         | ES      |              |             |                          |
|              |                                                                                   |                                                                                                                                                    |                                 |                         | 1.00         | B       |              |             |                          |
| 2.00         |  | MADE GROUND (Red and grey cobbles of burnt sandstone. Rubber belt present at 3.0m bgl).                                                            | 1.40                            | 81.50                   |              |         |              |             |                          |
|              |                                                                                   |                                                                                                                                                    |                                 |                         | 2.00         | ES<br>B |              |             |                          |
| 3.00         |  |                                                                                                                                                    | (1.80)                          |                         |              |         |              |             |                          |
|              |                                                                                   |                                                                                                                                                    |                                 |                         |              |         |              |             |                          |
| 4.00         |  | MADE GROUND (Brown clayey fine to coarse sandy gravel of subangular and subrounded sandstone)                                                      | 3.20                            | 79.70                   | 3.40         | B<br>ES |              |             |                          |
|              |                                                                                   |                                                                                                                                                    | (0.60)                          |                         |              |         |              |             |                          |
|              |                                                                                   | Firm friable brownish orange and grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine angular coal. Remnant rootlets present. | 3.80                            | 79.10                   | 4.20         | B<br>ES | 4.20         | 64 / 25 kPa |                          |
|              |                                                                                   |                                                                                                                                                    | (0.90)                          |                         |              |         |              |             |                          |
|              |                                                                                   | End of Trial Pit at 4.70 m                                                                                                                         | 4.70                            | 78.20                   |              |         |              |             |                          |

|                                                                                                                                      |                                            |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 82.9<br>Coordinates: 433186E - 409647N | Groundwater:<br>Slight seepage at 3.8m bgl |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|

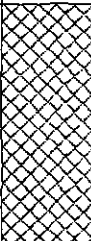
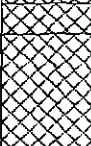
|                                                                                                                                                                                              |                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|

|                    |                                                  |                                     |
|--------------------|--------------------------------------------------|-------------------------------------|
| Trial Pit:<br>TP57 | <b>TRIAL PIT RECORD</b><br>North Gawber Colliery | Revision: Final<br>Project No 07053 |
|--------------------|--------------------------------------------------|-------------------------------------|



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                               |                              |                       | Samples   |         | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                   | Strata Depth (Thickness) (m) | Reduced Level (m AOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of dark grey clay bound fine to coarse sandy gravel of subangular coal, unburnt shale and burnt shale).                                                              | (1.60)                       |                       | 0.20      | ES      | 3.50      |      |                       |
|           |                                                                                   |                                                                                                                                                                                                               | 1.50                         | 82.30                 | 1.00      | B       |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                               | 1.80                         | 82.10                 | 1.50      | ES      |           |      |                       |
| 2.00      |  | MADE GROUND (Concrete foundations).                                                                                                                                                                           |                              |                       | 2.00      | ES      |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                               | (0.80)                       |                       |           |         |           |      |                       |
| 3.00      |  | MADE GROUND (Colliery discard consisting of grey/black fine to coarse gravel of angular and subangular unburnt shale, sandstone and coal).                                                                    | 2.60                         | 81.30                 | 2.80      | ES<br>B |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                               | (0.40)                       |                       |           |         |           |      |                       |
| 4.00      |  | Firm grey/yellow mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal. Cobbles and boulders of sandstone present also. | 3.00                         | 80.90                 | 3.50      | ES<br>B |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                               | (0.70)                       |                       |           |         |           |      |                       |
|           |                                                                                   | End of Trial Pit at 3.70 m                                                                                                                                                                                    | 3.70                         | 80.20                 |           |         |           |      |                       |

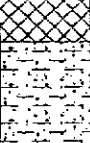
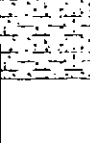
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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 83.9<br>Coordinates: 433246E - 409647N                                                         | Groundwater:<br>Slight seepage at 3.2m bgl. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.         |

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|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP58 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |

  
**SCOTT DOHERTY**  
 3549018125

Photograph:

| Strata                     |                                                                                   |                                                                                                                                                             |                              | Samples              |           | Tests |           |      |                       |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|-------|-----------|------|-----------------------|
| Depth (m)                  | Legend                                                                            | Description                                                                                                                                                 | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type  | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                       |  | MADE GROUND (Colliery discard consisting of dark brown clay bound fine to coarse gravel of subangular coal, unburnt shale and mudstone).                    | (1.00)                       |                      | 0.20      | ES    |           |      |                       |
|                            |                                                                                   |                                                                                                                                                             |                              |                      | 0.70      | ES    |           |      |                       |
|                            |                                                                                   |                                                                                                                                                             | 1.00                         | 84.70                |           |       |           |      |                       |
| 2.00                       |  | MADE GROUND (Colliery discard consisting of red and brown clayey fine to coarse sandy gravel of subangular burnt shale).                                    | (0.50)                       |                      | 1.40      | B     |           |      |                       |
|                            |                                                                                   |                                                                                                                                                             | 1.50                         | 84.20                |           |       |           |      |                       |
|                            |                                                                                   |                                                                                                                                                             |                              |                      |           |       |           |      |                       |
| 3.00                       |  | MADE GROUND (Colliery discard consisting of firm dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular unburnt shale). | (0.70)                       |                      | 1.80      | B     |           |      |                       |
|                            |                                                                                   |                                                                                                                                                             | 2.20                         | 83.50                |           |       |           |      |                       |
|                            |                                                                                   |                                                                                                                                                             |                              |                      |           |       |           |      |                       |
| 4.00                       |  | Firm grey and brown sandy to very sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium subangular to rounded coal and sandstone  | (1.20)                       |                      | 2.40      | ES    |           |      |                       |
|                            |                                                                                   |                                                                                                                                                             |                              |                      | 2.70      | B     | 2.70      |      | 64 / 14 kPa           |
|                            |                                                                                   |                                                                                                                                                             | 3.40                         | 82.30                | 3.40      | ES    |           |      |                       |
| End of Trial Pit at 3.40 m |                                                                                   |                                                                                                                                                             |                              |                      |           |       |           |      |                       |

|                                                                                                                                                                                              |                                            |
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| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 85.7<br>Coordinates: 433269E - 409679N                                                         | Groundwater:<br>Slight seepage at 3.2m bgl |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.        |

|                        |                                               |                                          |
|------------------------|-----------------------------------------------|------------------------------------------|
| Trial Pit:<br><br>TP59 | TRIAL PIT RECORD<br><br>North Gawber Colliery | Revision: Final<br><br>Project No. 07053 |
|------------------------|-----------------------------------------------|------------------------------------------|



Photograph:

| Strata    |        |                                                                                                                                                                                           |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend | Description                                                                                                                                                                               | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|           |        | TOPSOIL (Dark brown with fine and medium gravel of angular to subrounded coal, sandstone and mudstone).                                                                                   | (0.60)                       |                      | 0.20      | ES   |           |      |                       |
|           |        |                                                                                                                                                                                           | 0.60                         | 84.90                |           |      |           |      |                       |
| 1.00      |        | MADE GROUND (Colliery discard consisting of grey claybound fine to coarse sandy gravel of subangular coal, some unburnt shale and rare ceramic. Some cobbles of mudstone present also).   | (0.90)                       |                      | 1.10      | ES   |           |      |                       |
|           |        |                                                                                                                                                                                           | 1.50                         | 84.00                |           |      |           |      |                       |
| 2.00      |        | MADE GROUND (Colliery discard consisting of red fine to coarse sandy gravel of angular and subangular burnt shale).                                                                       | (0.30)                       | 1.80                 | 83.70     | 1.70 | ES        |      |                       |
|           |        |                                                                                                                                                                                           | (1.10)                       |                      |           | 2.40 | ES        |      |                       |
| 3.00      |        | MADE GROUND (Colliery discard consisting of dark grey fine to coarse sandy gravel of angular shale and coal).                                                                             | 2.90                         | 82.50                |           |      |           |      |                       |
|           |        | MADE GROUND (Firm dark grey mottled orange and brown sandy gravelly reworked clay. Sand is fine to coarse. Gravel is fine to coarse angular and subangular coal, sandstone and mudstone). | (0.50)                       | 3.40                 | 82.10     |      |           | 3.30 | 54 / 12 kPa           |
|           |        |                                                                                                                                                                                           | (0.30)                       | 3.70                 | 81.80     | 3.50 | ES        | 3.60 | 69 / 43 kPa           |
| 4.00      |        | Firm and stiff grey, occasionally mottled orange, sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular sandstone and rare coal.<br>End of Trial Pit at 3.70 m |                              |                      |           |      |           |      |                       |

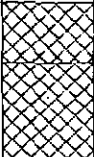
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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 85.5<br>Coordinates: 433236E - 409680N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

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|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP60       | North Gawber Colliery | Project No. 07053 |

SCOTT DOHERTY ASSOCIATES

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                  |                              |                      | Samples                                                                                                                                                |                       | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                      | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                                                                                                                              | Type                  | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Reinforced concrete).                                                                                                                               | (0.40)                       | 87.40                | 1.00                                                                                                                                                   | ES<br>B               |           |      |                       |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Colliery discard consisting of black/grey clay bound fine to coarse sandy gravel of angular and subangular unburnt shale, sandstone and much coal). | (1.70)                       |                      |                                                                                                                                                        |                       |           |      |                       |
| 2.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of red fine to coarse sandy gravel of angular and subangular burnt shale).                                              | 2.10                         | 85.70                | 2.00                                                                                                                                                   | ES<br>B               |           |      |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                  | (2.00)                       |                      |                                                                                                                                                        |                       |           |      |                       |
| 4.00                                                                                                                                                                                         |  | Firm green/grey sandy gravelly CLAY. Gravel is fine to coarse, subangular and subrounded sandstone and some coal.                                                | 4.10                         | 83.70                | 4.20                                                                                                                                                   | ES<br>B               | 4.00      |      | 42 / 0 kPa            |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 4.40 m                                                                                                                                       | (0.30)<br>4.40               | 83.40                |                                                                                                                                                        |                       |           |      |                       |
| Date of Excavation: 05/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 87.8<br>Coordinates: 433182E - 409703N                                                                |                                                                                   |                                                                                                                                                                  |                              |                      | Groundwater:<br>Groundwater not encountered.                                                                                                           |                       |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                  |                              |                      | Remarks:<br>Trial pit sides stable.<br>Concrete in one face of trial pit to 2.1m bgl. Buried water pipe 225mm in diameter also identified at 2.1m bgl. |                       |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                  | TRIAL PIT RECORD             |                      |                                                                                                                                                        | Revision: Final       |           |      |                       |
| TP62                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                  |                              |                      |                                                                                                                                                        | North Gawber Colliery |           |      | Project No. 07053     |



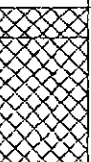
SCOTT  
DOHERTY  
ASSOCIATES



Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                  |                              |                                                                                                                                                               | Samples                                                                                     |                   | Tests     |      |                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------|-----------|------|------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                      | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                                                                                                                                          | Depth (m)                                                                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)        |
| 0.00 - 1.00                                                                                                                                                                                  |        | MADE GROUND (Colliery discard consisting of grey/black fine to coarse gravel of angular and subangular unburnt shale, sandstone and much coal.)                                  | 0.20                         | 87.10                                                                                                                                                         | 0.10                                                                                        | ES                |           |      |                              |
|                                                                                                                                                                                              |        | MADE GROUND (Reinforced concrete).                                                                                                                                               | (0.30)                       | 86.80                                                                                                                                                         |                                                                                             |                   |           |      |                              |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of grey/black fine to coarse gravel of angular and subangular unburnt shale, sandstone and coal).                                       | (0.70)                       |                                                                                                                                                               | 1.00                                                                                        | ES B              |           |      |                              |
| 1.00 - 2.00                                                                                                                                                                                  |        | MADE GROUND (Colliery discard consisting of red clay bound fine to coarse sandy gravel of angular and subangular burnt shale).                                                   | 1.20                         | 85.10                                                                                                                                                         | 1.50                                                                                        | ES                |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                  | (1.30)                       |                                                                                                                                                               | 2.00                                                                                        | B                 |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                  | 2.50                         | 84.80                                                                                                                                                         |                                                                                             |                   |           |      |                              |
| 2.00 - 3.00                                                                                                                                                                                  |        | MADE GROUND (Colliery discard consisting of red and black/grey clay bound fine to coarse sandy gravel of angular and subangular unburnt shale, burnt shale, sandstone and coal). | (0.40)                       | 84.40                                                                                                                                                         | 2.70                                                                                        | ES B              |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                  | 2.90                         |                                                                                                                                                               | 3.00                                                                                        | ES B              | 3.00      |      | 32 / 0 kPa                   |
|                                                                                                                                                                                              |        |                                                                                                                                                                                  | (0.60)                       |                                                                                                                                                               |                                                                                             |                   |           |      |                              |
| 3.00 - 4.00                                                                                                                                                                                  |        | Soft grey/green sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and some coal.                                         | 3.50                         | 83.80                                                                                                                                                         | 3.60                                                                                        | B                 | 3.60      |      | 50 / 0 kPa                   |
|                                                                                                                                                                                              |        |                                                                                                                                                                                  | 3.70                         | 83.60                                                                                                                                                         |                                                                                             |                   |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                  |                              | Firm grey/yellow mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal. |                                                                                             |                   |           |      |                              |
|                                                                                                                                                                                              |        |                                                                                                                                                                                  | End of Trial Pit at 3.70 m   |                                                                                                                                                               |                                                                                             |                   |           |      |                              |
| Date of Excavation: 05/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 87.3<br>Coordinates: 433145E - 409723N                                                                |        |                                                                                                                                                                                  |                              |                                                                                                                                                               | Groundwater:<br>Groundwater not encountered.                                                |                   |           |      |                              |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                  |                              |                                                                                                                                                               | Remarks:<br>Trial pit sides stable.<br>Concrete found in one face of trial pit to 1.4m bgl. |                   |           |      |                              |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                  | TRIAL PIT RECORD             |                                                                                                                                                               |                                                                                             | Revision: Final   |           |      | <br>SCOTT COHERLY ASSOCIATES |
| TP63                                                                                                                                                                                         |        |                                                                                                                                                                                  | North Gawber Colliery        |                                                                                                                                                               |                                                                                             | Project No. 07053 |           |      |                              |

Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                  |                              |                      | Samples   |         | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                      | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Reinforced concrete).                                                                                                                                                                               | 0.20                         | 86.30                | 0.50      | ES<br>B |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of red and brown clay bound fine to coarse sandy gravel of subangular burnt shale, unburnt shale and much coal. Railway sleepers found and hydrocarbon odour detected). | (2.40)                       |                      |           |         |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                  | 2.60                         | 83.90                | 3.00      | ES<br>B | 3.00      |      | 18 / 0 kPa            |
| 3.00      |  | MADE GROUND (Soft green/yellow sandy slightly gravelly silt/clay. Gravel is fine to coarse subangular and subrounded sandstone, mudstone, unburnt shale and coal).                                               | (0.70)                       |                      |           |         |           |      |                       |
| 3.50      |  | Firm grey/yellow mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of sandstone and occasional coal.                                                  | 3.30                         | 83.20                | 3.50      | ES<br>B | 3.50      |      | 47 / 0 kPa            |
|           |                                                                                   |                                                                                                                                                                                                                  | (0.30)                       |                      |           |         |           |      |                       |
| 4.00      |                                                                                   | End of Trial Pit at 3.60 m                                                                                                                                                                                       | 3.60                         | 82.90                |           |         |           |      |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 04/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 86.5<br>Coordinates: 433112E - 409732N                                                                | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|            |                       |                   |
|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP64       | North Gawber Colliery | Project No. 07053 |



SCOTT  
DOHERTY  
TRANSLATION

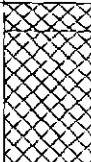
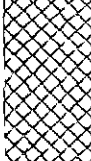
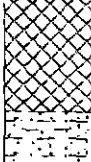
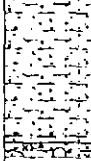
Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                     |                              |                      | Samples                                     |                   | Tests     |      |                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                         | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                   | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                                   |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Yellow fine to coarse gravel of subangular dolomite).                                                                                  | 0.20                         | 89.40                | 0.40<br>0.50                                | ES<br>B           |           |      |                                                                                                                         |
|                                                                                                                                                                                              |        | MADE GROUND (Colliery discard consisting of dark grey and red fine to coarse gravel of subangular unburnt shale, burnt shale, clinker and coal).    | (1.20)                       |                      |                                             |                   |           |      |                                                                                                                         |
| 2.00                                                                                                                                                                                         |        | MADE GROUND (Light brown fine to coarse gravel of subangular sandstone with many cobbles of sandstone. Occasional boulders present after 3.0m bgl). | 1.40                         | 88.20                | 1.60<br><br>2.50<br>2.60                    | ES<br><br>B<br>ES |           |      |                                                                                                                         |
|                                                                                                                                                                                              |        |                                                                                                                                                     | (2.80)                       |                      |                                             |                   |           |      |                                                                                                                         |
| 4.00                                                                                                                                                                                         |        | Stiff grey mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular sandstone.<br>End of Trial Pit at 4.40 m  | 4.20                         | 85.40                | 4.30                                        | ES<br>B           | 4.40      |      | 88 / 17 kPa                                                                                                             |
|                                                                                                                                                                                              |        |                                                                                                                                                     | 4.40                         | 85.20                |                                             |                   |           |      |                                                                                                                         |
| Date of Excavation: 02/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 89.6<br>Coordinates: 433108E - 409761N                                                         |        |                                                                                                                                                     |                              |                      | Groundwater:<br>Slight seepage at 3.8m bgl. |                   |           |      |                                                                                                                         |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                     |                              |                      | Remarks:<br>Trial pit sides stable.         |                   |           |      |                                                                                                                         |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                     | TRIAL PIT RECORD             |                      |                                             | Revision: Final   |           |      | <br>SCOTT<br>DOHERTY<br>ASSOCIATES |
| TP65                                                                                                                                                                                         |        |                                                                                                                                                     | North Gawber Colliery        |                      |                                             | Project No. 07053 |           |      |                                                                                                                         |

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                        |                              | Samples                                      |           | Tests                 |           |      |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-----------|-----------------------|-----------|------|---------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                            | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                         | Depth (m) | Type                  | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                 |
| 0.20                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of dark grey fine to coarse sandy gravel of subangular unburnt shale, coal and some burnt shale. Some cobbles of unburnt shale present also). | (3.50)                       |                                              | 0.20      | ES                    |           |      |                                                                                       |
| 1.20                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                        |                              |                                              | ES        |                       |           |      |                                                                                       |
| 1.50                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                        |                              |                                              | B         |                       |           |      |                                                                                       |
| 2.50                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                        |                              |                                              | B         |                       |           |      |                                                                                       |
| 3.50                                                                                                                                                                                         |  | Moderately strong dark grey very thinly bedded MUDSTONE.                                                                                                                               | (1.10)                       |                                              | 3.50      | ES                    |           |      |                                                                                       |
| 4.50                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                        |                              |                                              | ES        |                       |           |      |                                                                                       |
| End of Trial Pit at 4.60 m                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                        |                              |                                              |           |                       |           |      |                                                                                       |
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 91.3<br>Coordinates: 433085E - 409811N                                                         |                                                                                   |                                                                                                                                                                                        |                              | Groundwater:<br>Groundwater not encountered. |           |                       |           |      |                                                                                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                        |                              | Remarks:<br>Trial pit sides stable.          |           |                       |           |      |                                                                                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                        | TRIAL PIT RECORD             |                                              |           | Revision: Final       |           |      |  |
| TP66                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                        |                              |                                              |           | North Gawber Colliery |           |      |                                                                                       |

Photograph:

| Strata       |                                                                                   |                                                                                                                                                                                        |                                 | Samples                 |              | Tests   |              | MEXE | Shear Vane<br>(Peak/Ret) |
|--------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------|--------------|---------|--------------|------|--------------------------|
| Depth<br>(m) | Legend                                                                            | Description                                                                                                                                                                            | Strata Depth<br>(Thickness) (m) | Reduced<br>Level (mAOD) | Depth<br>(m) | Type    | Depth<br>(m) |      |                          |
| 1.00         |  | MADE GROUND (Reinforced concrete).                                                                                                                                                     | 0.20                            | 91.40                   |              |         |              |      |                          |
|              |                                                                                   | MADE GROUND (Colliery discard<br>consisting of black/grey clay bound fine to<br>coarse sandy gravel of angular and<br>subangular unburnt shale, sandstone and<br>coal)                 |                                 |                         |              |         |              |      |                          |
| 2.00         |  |                                                                                                                                                                                        | (2.70)                          |                         | 1.50         | ES<br>B |              |      |                          |
|              |                                                                                   |                                                                                                                                                                                        |                                 |                         |              |         |              |      |                          |
| 3.00         |  | Firm brown sandy gravelly CLAY. Sand is<br>fine to coarse. Gravel is fine to coarse<br>subangular and subrounded sandstone<br>and occasional coal.                                     | 2.80                            | 88.70                   |              |         |              |      |                          |
|              |                                                                                   |                                                                                                                                                                                        | (1.30)                          |                         | 3.50         | ES<br>B | 3.50         |      | 43.10 kPa                |
| 4.00         |  |                                                                                                                                                                                        | 4.20                            | 87.40                   | 4.20         | B       |              |      |                          |
|              |                                                                                   | Yellow/brown very clayey sandy GRAVEL<br>Gravel is fine to coarse angular and<br>subangular sandstone. Cobbles and<br>boulders of sandstone present also<br>End of Trial Pit at 4.30 m | 4.30                            | 87.30                   |              |         |              |      |                          |

Date of Excavation: 09/10/2007  
 Equipment: JCB 3CX  
 Logged By: CB  
 Ground Level: 91.6  
 Coordinates: 433108E - 409825N

Groundwater:  
 Groundwater not encountered

Legend:  
 D Small Disturbed Sample  
 B Bulk Disturbed Sample  
 EW Water Sample for Environmental Testing  
 ES Soil Sample for Environmental Testing  
 U Undisturbed Sample - Open Drive

Remarks:  
 Trial pit sides stable

Trial Pit:  
 TP67

TRIAL PIT RECORD  
 North Gawber Colliery

Revision: Final

Project No: 07053



Photograph:

| Strata    |                                                                                   |                                                                                                                 |                              | Samples              |           | Tests |           |      |                       |
|-----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|-------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type  | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of dark grey fine to coarse sandy gravel of subangular unburnt shale). | (0.30)                       | 91.00                | 0.10      | ES    |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of red fine to coarse gravel of angular and subangular burnt shale).   | (1.20)                       |                      | 0.40      | ES    |           |      |                       |
| 2.00      |  | MADE GROUND (Grey and brown cobbles of sandstone and mudstone).                                                 | 1.50                         | 89.80                | 1.10      | B     |           |      |                       |
|           |                                                                                   |                                                                                                                 | (1.50)                       |                      | 2.00      | ES    |           |      |                       |
| 3.00      |  | Moderately weak grey weathered orange very thinly bedded coarse grained SANDSTONE.                              | 3.00                         | 88.30                |           |       |           |      |                       |
|           |                                                                                   |                                                                                                                 | (0.70)                       |                      |           |       |           |      |                       |
| 4.00      |                                                                                   | End of Trial Pit at 3.70 m                                                                                      | 3.70                         | 87.60                |           |       |           |      |                       |
|           |                                                                                   |                                                                                                                 |                              |                      |           |       |           |      |                       |

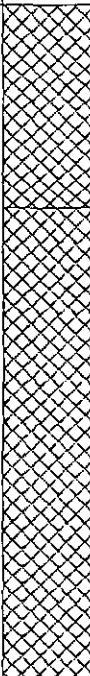
|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 91.3<br>Coordinates: 433097E - 409797N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|                        |                       |                   |
|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP68 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |

  
 SCOTT DOHERTY  
 ASSOCIATES

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                               |                              |                      | Samples                                      |                       | Tests     |                                                                                                                     |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-----------------------|-----------|---------------------------------------------------------------------------------------------------------------------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                   | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type                  | Depth (m) | MEXE                                                                                                                | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Colliery discard consisting of grey clay bound fine to coarse gravel of angular and subangular unburnt shale, burnt shale, sandstone, coal and rare glass. Cobbles of whole brick present also). | (1.40)                       |                      | 1.00                                         | B ES                  |           |                                                                                                                     |                       |
| 2.00                                                                                                                                                                                         |                                                                                   | MADE GROUND (Colliery discard consisting of grey fine to coarse gravel of angular and subangular unburnt shale, sandstone and coal. Cobbles of sandstone, iron bars and iron plates present also).            | 1.40                         | 89.70                | 2.00                                         | ES                    |           |                                                                                                                     |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                               | (3.20)                       |                      | 3.00                                         | ES                    |           |                                                                                                                     |                       |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                               |                              |                      |                                              |                       |           |                                                                                                                     |                       |
|                                                                                                                                                                                              |                                                                                   | Firm friable damp grey and brown sandy gravelly CLAY. Sand is fine to coarse.                                                                                                                                 | 4.60                         | 86.50                | 4.70                                         | B ES                  | 4.70      |                                                                                                                     | 62 / 18 kPa           |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                               | 4.80                         | 86.30                |                                              |                       |           |                                                                                                                     |                       |
| Continued next sheet                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                               |                              |                      |                                              |                       |           |                                                                                                                     |                       |
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 91.1<br>Coordinates: 433123E - 409787N                                                         |                                                                                   |                                                                                                                                                                                                               |                              |                      | Groundwater:<br>Groundwater not encountered. |                       |           |                                                                                                                     |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                               |                              |                      | Remarks:<br>Trial pit sides stable.          |                       |           |                                                                                                                     |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                               | TRIAL PIT RECORD             |                      |                                              | Revision: Final       |           | <br>SCOTT DOHERTY<br>950012745 |                       |
| TP69                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                               |                              |                      |                                              | North Gawber Colliery |           |                                                                                                                     |                       |

Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                   |                              |                      | Samples                                      |                   | Tests     |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                       | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
|                                                                                                                                                                                              |        | Gravel is fine and medium angular and subangular coal and sandstone<br>End of Trial Pit at 4.80 m |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 6.00                                                                                                                                                                                         |        |                                                                                                   |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 7.00                                                                                                                                                                                         |        |                                                                                                   |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 8.00                                                                                                                                                                                         |        |                                                                                                   |                              |                      |                                              |                   |           |      |                                                                                                                   |
| 9.00                                                                                                                                                                                         |        |                                                                                                   |                              |                      |                                              |                   |           |      |                                                                                                                   |
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 91.1<br>Coordinates: 433123E - 409787N                                                         |        |                                                                                                   |                              |                      | Groundwater:<br>Groundwater not encountered. |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                   |                              |                      | Remarks:<br>Trial pit sides stable.          |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                   | TRIAL PIT RECORD             |                      |                                              | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP69                                                                                                                                                                                         |        |                                                                                                   | North Gawber Colliery        |                      |                                              | Project No. 07053 |           |      |                                                                                                                   |



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                         |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                             | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
|           |  | MADE GROUND (Reinforced concrete)                                                                                                                                       | 0.20                         | 91.00                | 0.20      | ES   |           |      |                       |
|           |                                                                                   | MADE GROUND (Colliery discard consisting of red fine to coarse sandy gravel of angular and subangular burnt shale and brick).                                           | 0.30                         | 90.90                |           |      |           |      |                       |
| 1.00      |  | MADE GROUND (Colliery discard consisting of grey clay bound fine to coarse gravel of angular and subangular unburnt shale, slag, ash, sandstone and coal).              | (1.90)                       |                      | 1.00      | ES B |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                         |                              |                      |           |      |           |      |                       |
|           |  | Yellow/brown very clayey fine to coarse sandy GRAVEL. Gravel is angular and subangular sandstone. Cobbles and boulder of sandstone and inclusions of clay present also. | 2.20                         | 89.00                | 2.50      | ES B |           |      |                       |
|           |                                                                                   |                                                                                                                                                                         | (0.60)                       |                      |           |      |           |      |                       |
| 3.00      |  | Firm brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone and occasional coal.                               | 2.80                         | 88.40                | 3.50      | B    | 3.50      |      | 42 / 0 kPa            |
|           |                                                                                   |                                                                                                                                                                         | (1.10)                       |                      |           |      |           |      |                       |
| 4.00      |                                                                                   | End of Trial Pit at 3.90 m                                                                                                                                              | 3.90                         | 87.30                |           |      |           |      |                       |

|                                                                                                                               |                                             |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 09/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 91.2<br>Coordinates: 433148E - 409779N | Groundwater:<br>Groundwater not encountered |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|

|                                                                                                                                                                                              |                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|

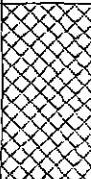
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|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP70       | North Gawber Colliery | Project No. 07053 |



Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                                                                 |                              |                      | Samples                                                                                           |                                                                                       | Tests     |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------|------|-----------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                                                                         | Type                                                                                  | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Demolition waste consisting of dark brown and grey fine to coarse gravel of angular and subangular brick and concrete. Many cobbles of whole brick and boulders of concrete present also. Iron girders, concrete slabs, metal bars and fabric machine belt found). | (4.20)                       |                      | 1.00                                                                                              | ES                                                                                    |           |      |                       |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                 |                              |                      | 2.00                                                                                              | ES                                                                                    |           |      |                       |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                 |                              |                      | 3.00                                                                                              | ES                                                                                    |           |      |                       |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                 |                              |                      | 4.00                                                                                              | ES                                                                                    |           |      |                       |
|                                                                                                                                                                                              |                                                                                   | End of Trial Pit at 4.20 m                                                                                                                                                                                                                                                      | 4.20                         | 88.40                |                                                                                                   |                                                                                       |           |      |                       |
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 92.6<br>Coordinates: 433134E - 409817N                                                         |                                                                                   |                                                                                                                                                                                                                                                                                 |                              |                      | Groundwater:<br>Groundwater not encountered.                                                      |                                                                                       |           |      |                       |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                                                                 |                              |                      | Remarks:<br>Trial pit sides stable.<br>Brick wall present in north face of trial pit to 2.5m bgl. |                                                                                       |           |      |                       |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                                                 | TRIAL PIT RECORD             |                      |                                                                                                   | Revision: Final                                                                       |           |      |                       |
| TP71                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                                 |                              |                      |                                                                                                   | Project No. 07053                                                                     |           |      |                       |
|                                                                                                                                                                                              |                                                                                   |                                                                                                                                                                                                                                                                                 | North Gawber Colliery        |                      |                                                                                                   |  |           |      |                       |

Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                     |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                         | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Demolition waste consisting of brown and grey fine to coarse gravel of subangular unburnt shale, concrete and coal. Many cobbles and boulders of concrete present also. Metal sheeting, steel cables, reinforced concrete slabs and metal drum found). | (1.20)                       |                      | 1.00      | ES   |           |      |                       |
|           |  | MADE GROUND (Concrete).                                                                                                                                                                                                                                             | 1.20                         | 90.90                |           |      |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                                                                                                     | 1.40                         | 90.70                |           |      |           |      |                       |
| 2.00      |  | Yellow brown SANDSTONE recovered as fine to coarse angular and subangular gravel and cobbles.                                                                                                                                                                       | (2.40)                       |                      | 2.00      | ES B |           |      |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                                     |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   | End of Trial Pit at 3.80 m                                                                                                                                                                                                                                          | 3.80                         | 88.30                |           |      |           |      |                       |

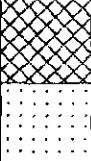
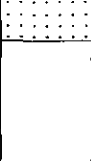
|                                                                                                                                                                                              |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 92.1<br>Coordinates: 433166E - 409803N                                                         | Groundwater:<br>Groundwater not encountered |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.         |

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|------------|-----------------------|-------------------|
| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP72       | North Gawber Colliery | Project No. 07053 |



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                       |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Colliery discard consisting of dark grey fine to coarse sandy gravel of subangular coal, slag, burnt shale and brick. Cobbles of whole brick and concrete present also). | (1.10)                       |                      | 0.20      | ES   |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                       |                              |                      |           |      |           |      |                       |
|           |  | MADE GROUND (Colliery discard consisting of brown fine to coarse gravelly sand. Gravel is angular and subangular sandstone and brick. Many cobbles of whole brick present also).      | (0.80)                       | 89.80                | 1.00      | B    |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                       |                              |                      |           |      |           |      |                       |
| 2.00      |  | MADE GROUND (Brick foundations).                                                                                                                                                      | (0.80)                       | 89.00                | 1.20      | ES   |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                       |                              |                      |           |      |           |      |                       |
| 3.00      |  | Weak brownish grey very thin to thin bedded coarse grained weathered SANDSTONE.                                                                                                       | (0.80)                       | 88.20                | 3.00      | ES   |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                       |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   | End of Trial Pit at 3.50 m                                                                                                                                                            | 3.50                         | 87.40                |           |      |           |      |                       |
|           |                                                                                   |                                                                                                                                                                                       |                              |                      |           |      |           |      |                       |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 90.9<br>Coordinates: 433179E - 409777N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

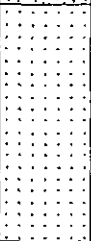
  

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|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP73 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



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Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                  |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                      | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00      |  | MADE GROUND (Demolition waste consisting of dark grey and dark brown fine to coarse sandy gravel of subangular brick, coal and mudstone. Many cobbles of whole and broken brick present also. Pieces of timber, iron plate and iron pipe found). | 0.80                         | 90.40                | 0.20      | ES   | 0.90      |      | 102 / 58 kPa          |
|           |  | Stiff brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium angular and subangular coal and sandstone.                                                                                                                    | 0.60                         |                      | 1.00      | ES B |           |      |                       |
|           |  | Grey weathered dark brown very weak becoming moderately strong with depth very thinly bedded coarse grained SANDSTONE.                                                                                                                           | 1.40                         | 89.80                | 2.00      | B ES |           |      |                       |
| 3.00      |                                                                                   | End of Trial Pit at 3.00 m                                                                                                                                                                                                                       | 3.00                         | 88.20                |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                  |                              |                      |           |      |           |      |                       |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 91.2<br>Coordinates: 433205E - 409789N                                                         | Groundwater:<br>Groundwater not encountered.                                                                            |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Concrete obstruction encountered at 0.4m bgl. Trial pit moved 2.0m to the south. |

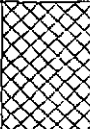
  

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|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP74 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



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Photograph:

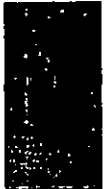
| Strata                     |                                                                                   |                                                                                                                                                                                                                 |                              |                      | Samples   |         | Tests     |      |                       |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|
| Depth (m)                  | Legend                                                                            | Description                                                                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 1.00                       |  | MADE GROUND (Demolition fill consisting of brown fine to coarse sandy gravel of angular and subangular sandstone, brick, concrete and rare coal. Cobbles of concrete and whole and broken bricks present also). | (0.90)                       |                      | 2.00      | ES<br>B |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                 | 0.90                         | 89.70                |           |         |           |      |                       |
|                            |                                                                                   | MADE GROUND (Concrete foundation).                                                                                                                                                                              | 1.10                         | 89.50                |           |         |           |      |                       |
| MADE GROUND (Many bricks). | 1.30                                                                              | 89.30                                                                                                                                                                                                           |                              |                      |           |         |           |      |                       |
| 2.00                       |  | MADE GROUND (Colliery discard consisting of red and grey/black clay bound fine to coarse gravel of angular and subangular unburnt shale, burnt shale, sandstone and coal).                                      | (2.80)                       |                      |           |         |           |      |                       |
|                            |                                                                                   |                                                                                                                                                                                                                 |                              |                      |           |         |           |      |                       |
| 3.00                       |                                                                                   |                                                                                                                                                                                                                 |                              |                      |           |         |           |      |                       |
| 4.00                       |                                                                                   |                                                                                                                                                                                                                 |                              |                      |           |         |           |      |                       |
|                            |                                                                                   | End of Trial Pit at 4.10 m                                                                                                                                                                                      | 4.10                         | 88.50                |           |         |           |      |                       |

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| Date of Excavation: 09/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 90.6<br>Coordinates: 433147E - 409751N                                                                | Groundwater:<br>Groundwater not encountered.                                              |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Brick wall found in side of trial pit to 3.3m bgl. |

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| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP75       | North Gawber Colliery | Project No. 07053 |

  
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Photograph:

| Strata                                                                                                                                                                                       |        |                                                                                                                                                                                                 |                              |                      | Samples                                                                                |                   | Tests     |      |                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|----------------------------------------------------------------------------------------|-------------------|-----------|------|------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend | Description                                                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                                                              | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)        |
|                                                                                                                                                                                              |        | MADE GROUND (Concrete).                                                                                                                                                                         | 0.10                         | 90.60                |                                                                                        |                   |           |      |                              |
| 1.00                                                                                                                                                                                         |        | MADE GROUND (Colliery discard consisting of grey/black sandy fine to coarse gravel of angular and subangular unburnt shale, burnt shale, sandstone, many bricks and coal).                      | (3.40)                       |                      | 0.50                                                                                   | ES B              |           |      |                              |
| 2.00                                                                                                                                                                                         |        |                                                                                                                                                                                                 |                              |                      |                                                                                        |                   |           |      |                              |
| 3.00                                                                                                                                                                                         |        |                                                                                                                                                                                                 |                              |                      |                                                                                        |                   |           |      |                              |
| 3.50                                                                                                                                                                                         |        | Firm friable damp grey mottled brown and yellow, red in places, sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded sandstone, shale and some coal. | 3.50                         | 87.20                | 3.60                                                                                   | ES B              | 3.60      |      | 52 / 0 kPa                   |
| 4.00                                                                                                                                                                                         |        | (0.30)<br>3.80                                                                                                                                                                                  | 86.90                        |                      |                                                                                        |                   |           |      |                              |
|                                                                                                                                                                                              |        | End of Trial Pit at 3.80 m                                                                                                                                                                      |                              |                      |                                                                                        |                   |           |      |                              |
| Date of Excavation: 04/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 90.7<br>Coordinates: 433189E - 409752N                                                                |        |                                                                                                                                                                                                 |                              |                      | Groundwater:<br>Groundwater not encountered.                                           |                   |           |      |                              |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |        |                                                                                                                                                                                                 |                              |                      | Remarks:<br>Trial pit sides stable.<br>Brick wall encountered at 0.3m bgl to 3.5m bgl. |                   |           |      |                              |
| Trial Pit:                                                                                                                                                                                   |        |                                                                                                                                                                                                 | TRIAL PIT RECORD             |                      |                                                                                        | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP76                                                                                                                                                                                         |        |                                                                                                                                                                                                 | North Gawber Colliery        |                      |                                                                                        | Project No. 07053 |           |      |                              |

Photograph:

| Strata                                                                                                                                                                                       |                                                                                   |                                                                                                                                                                                                                                                                   |                              |                      | Samples                                                                      |                   | Tests     |      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|------------------------------------------------------------------------------|-------------------|-----------|------|-------------------------------------------------------------------------------------------------------------------|
| Depth (m)                                                                                                                                                                                    | Legend                                                                            | Description                                                                                                                                                                                                                                                       | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)                                                                    | Type              | Depth (m) | MEXE | Shear Vane (Peak/Res)                                                                                             |
| 1.00                                                                                                                                                                                         |  | MADE GROUND (Demolition waste consisting of dark grey and dark brown fine to coarse sandy gravel of subangular brick, concrete, coal and mudstone. Many cobbles of whole and broken brick and sandstone present also. Pieces of timber, plastic and pipes found). | (3.60)                       |                      | 1.00                                                                         | ES B              |           |      |                                                                                                                   |
| 2.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                   |                              |                      |                                                                              |                   |           |      |                                                                                                                   |
| 3.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                   |                              |                      |                                                                              |                   |           |      |                                                                                                                   |
| 4.00                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                   |                              |                      |                                                                              |                   |           |      |                                                                                                                   |
|                                                                                                                                                                                              |                                                                                   | MADE GROUND (Tarmacadam)<br>End of Trial Pit at 3.65 m                                                                                                                                                                                                            | 3.60                         | 86.40                |                                                                              |                   |           |      |                                                                                                                   |
| Date of Excavation: 05/10/2007<br>Equipment: JCB 3CX<br>Logged By: CB<br>Ground Level: 90.0<br>Coordinates: 433192E - 409731N                                                                |                                                                                   |                                                                                                                                                                                                                                                                   |                              |                      | Groundwater:<br>Groundwater not encountered.                                 |                   |           |      |                                                                                                                   |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive |                                                                                   |                                                                                                                                                                                                                                                                   |                              |                      | Remarks:<br>Trial pit sides raveling and collapse of pit sides from surface. |                   |           |      |                                                                                                                   |
| Trial Pit:                                                                                                                                                                                   |                                                                                   |                                                                                                                                                                                                                                                                   | TRIAL PIT RECORD             |                      |                                                                              | Revision: Final   |           |      | <br>SCOTT DOHERTY ASSOCIATES |
| TP77                                                                                                                                                                                         |                                                                                   |                                                                                                                                                                                                                                                                   | North Gawber Colliery        |                      |                                                                              | Project No. 07053 |           |      |                                                                                                                   |



Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                      | Samples   |      | Tests     |      |                       |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|-----------|------|-----------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | Depth (m) | MEXE | Shear Vane (Peak/Res) |
| 0.00      |  | MADE GROUND (Demolition waste consisting of dark brown fine to coarse sandy gravel of angular to subrounded coal, unburnt shale, brick, ash and rare slate. Many cobbles of whole and broken brick and concrete present. Rare boulders of sandstone and concrete, pieces of timber, strips of fabric and iron nails present also. Iron door found at 1.0m bgl and iron pipe found at 2.4m bgl). | (3.00)                       |                      | 0.20      | ES   |           |      |                       |
| 1.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                      | B         |      |           |      |                       |
| 1.40      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                      | ES        |      |           |      |                       |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                      | B         |      |           |      |                       |
| 2.60      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                      | ES        |      |           |      |                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 | 3.00                         | 87.70                |           |      |           |      |                       |
|           |                                                                                   | Moderately weak light brown with some orange staining very thinly bedded coarse grained weathered SANDSTONE.                                                                                                                                                                                                                                                                                    | 3.20                         | 87.50                | 3.10      | ES   |           |      |                       |
|           |                                                                                   | End of Trial Pit at 3.20 m                                                                                                                                                                                                                                                                                                                                                                      |                              |                      |           |      |           |      |                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                      |           |      |           |      |                       |

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| Date of Excavation: 01/10/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 90.7<br>Coordinates: 433223E - 409753N                                                         | Groundwater:<br>Groundwater not encountered.                                                                           |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.<br>Concrete obstruction encountered at 1.2m bgl. Trial pit moved 5.0m to the west. |

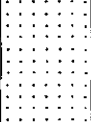
  

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| Trial Pit: | TRIAL PIT RECORD      | Revision: Final   |
| TP78       | North Gawber Colliery | Project No. 07053 |



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Photograph:

| Strata    |                                                                                   |                                                                                                                                                                                                                            |                                                                                   |                      | Samples   |         | Tests     |      |                       |         |
|-----------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------|-----------|---------|-----------|------|-----------------------|---------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                | Strata Depth (Thickness) (m)                                                      | Reduced Level (mAOD) | Depth (m) | Type    | Depth (m) | MEXE | Shear Vane (Peak/Res) |         |
| 0.50      |  | MADE GROUND (Demolition waste consisting of cobbles of whole and broken brick and concrete with iron bars, strips of fabric, rubber pipes, pieces of timber and some fragments of glass. Steel cable present at 0.5m bgl). | (2.10)                                                                            |                      | 0.50      | ES      | 2.40      |      | 101 / 23 kPa          |         |
| 1.50      |                                                                                   |                                                                                                                                                                                                                            |                                                                                   |                      | ES        |         |           |      |                       |         |
| 2.00      |                                                                                   |                                                                                                                                                                                                                            |  | 2.10                 | 87.90     | 2.20    |           |      |                       | ES<br>B |
|           |                                                                                   |                                                                                                                                                                                                                            |                                                                                   | (0.50)               |           |         |           |      |                       |         |
| 2.60      |  | Stiff grey mottled orange and brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular and subangular sandstone and coal.                                                                       | 2.60                                                                              | 87.40                | 2.70      | B<br>ES |           |      |                       |         |
| 3.00      |                                                                                   |                                                                                                                                                                                                                            |                                                                                   |                      |           |         |           |      |                       |         |
| 3.50      |                                                                                   | Grey weathered orange moderately weak and moderately strong very thinly bedded coarse grained SANDSTONE. Well weathered in upper 0.5m of horizon.                                                                          | (0.90)                                                                            |                      |           |         |           |      |                       |         |
|           |                                                                                   | End of Trial Pit at 3.50 m                                                                                                                                                                                                 | 3.50                                                                              | 86.50                |           |         |           |      |                       |         |
| 4.00      |                                                                                   |                                                                                                                                                                                                                            |                                                                                   |                      |           |         |           |      |                       |         |

|                                                                                                                                                                                              |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Date of Excavation: 21/09/2007<br>Equipment: JCB 3CX<br>Logged By: B Johnson<br>Ground Level: 90.0<br>Coordinates: 433255E - 409741N                                                         | Groundwater:<br>Groundwater not encountered. |
| Legend:<br>D Small Disturbed Sample<br>B Bulk Disturbed Sample<br>EW Water Sample for Environmental Testing<br>ES Soil Sample for Environmental Testing<br>U Undisturbed Sample - Open Drive | Remarks:<br>Trial pit sides stable.          |

|                        |                       |                   |
|------------------------|-----------------------|-------------------|
| Trial Pit:<br><br>TP79 | TRIAL PIT RECORD      | Revision: Final   |
|                        | North Gawber Colliery | Project No. 07053 |



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**APPENDIX C**  
**Rotary Openhole Logs**

| Strata                                                                                                                                                                                                                    |        |                                  | Sheet 1 of 1                                        |                      | Core Data / Samples |         |                                                                                                                                                                                                  |         |                |           |      |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------|-----------------------------------------------------|----------------------|---------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|-----------|------|--------------|
| Depth (m)                                                                                                                                                                                                                 | Legend | Description                      | Strata Depth (Thickness) (m)                        | Reduced Level (mAOD) | Core Run (m)        | TCR (%) | SCR (%)                                                                                                                                                                                          | RQD (%) | F <sub>1</sub> | Depth (m) | Type | Installation |
|                                                                                                                                                                                                                           |        | MADE GROUND (Brick and ash fill, |                                                     |                      |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
| 1.00                                                                                                                                                                                                                      |        |                                  | (1.50)                                              |                      |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
|                                                                                                                                                                                                                           |        | Light brown CLAY                 |                                                     | 83.40                |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
| 2.00                                                                                                                                                                                                                      |        |                                  | (2.20)                                              |                      |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
|                                                                                                                                                                                                                           |        | Brown SANDSTONE                  |                                                     | 81.20                |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
| 4.00                                                                                                                                                                                                                      |        |                                  | (1.70)                                              |                      |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
|                                                                                                                                                                                                                           |        | Broken gravelly SANDSTONE        |                                                     | 79.50                |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
| 6.00                                                                                                                                                                                                                      |        |                                  | (1.10)                                              |                      |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
|                                                                                                                                                                                                                           |        | Grey MUDSTONE                    |                                                     | 78.40                |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
| 7.00                                                                                                                                                                                                                      |        |                                  | (2.50)                                              |                      |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
| 9.00                                                                                                                                                                                                                      |        | End of Borehole at 9.00 m        | 9.00                                                | 75.90                |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |
| Start Date 23/10/2007<br>End Date 23/10/2007<br>Method Rotary oper hole using Geotech 6 ng<br>Drilled By J.B. Site Investigations<br>Logged By D. Hood<br>Ground Level 84.900 mAOD<br>Coordinates 432970 00E - 408740 00N |        |                                  | Water Strikes<br>8.00m: Rose to 6.25m after 20 mins |                      |                     |         | Legend<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |         |                |           |      |              |
| Remarks<br>Borehole logs compiled from driller's descriptions<br>Moderate (50%) flush loss reported between 5.4 and 6.5m bg. Full flush return reported after 6.5m bg.                                                    |        |                                  |                                                     |                      |                     |         |                                                                                                                                                                                                  |         |                |           |      |              |

|                         |                                                        |                                      |                                     |
|-------------------------|--------------------------------------------------------|--------------------------------------|-------------------------------------|
| Borehole:<br><b>RO1</b> | <b>ROTARY BOREHOLE RECORD</b><br>North Gawber Colliery | Revision: Final<br>Project No: 07053 | <br><b>SCOTT DOHERTY ASSOCIATES</b> |
|-------------------------|--------------------------------------------------------|--------------------------------------|-------------------------------------|

| Depth (m) | Legend | Description                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCH (%) | SCR (%) | RQC (%) | F <sub>1</sub> | Depth (m) | Type | Installation |
|-----------|--------|--------------------------------------------|------------------------------|----------------------|--------------|---------|---------|---------|----------------|-----------|------|--------------|
| 1.00      |        | MADE GROUND (Asst. brck and concrete fill) |                              |                      |              |         |         |         |                |           |      |              |
| 2.00      |        |                                            | (4.10)                       |                      |              |         |         |         |                |           |      |              |
| 3.00      |        |                                            |                              |                      |              |         |         |         |                |           |      |              |
| 4.00      |        |                                            | 4.10                         | 84.10                |              |         |         |         |                |           |      |              |
| 5.00      |        | Yellow SANDSTONE                           | (1.20)                       |                      |              |         |         |         |                |           |      |              |
| 6.00      |        | Broken gravelly SANDSTONE                  | 5.30                         | 82.90                |              |         |         |         |                |           |      |              |
| 7.00      |        | Hard yellow SANDSTONE                      | 6.10                         | 82.10                |              |         |         |         |                |           |      |              |
| 8.00      |        |                                            | (1.00)                       |                      |              |         |         |         |                |           |      |              |
| 9.00      |        | Grey MUDSTONE                              | 7.10                         | 81.10                |              |         |         |         |                |           |      |              |
|           |        | End of Borehole at 7.50 m                  | (0.40)<br>7.50               | 80.70                |              |         |         |         |                |           |      |              |

Start Date 23/10/2007  
 End Date 23/10/2007  
 Method Rotary open hole using Geotech 6 ng  
 Drilled By J.B. Site Investigations  
 Logged By D. Hood  
 Ground Level 88.200 mAOD  
 Coordinates 433015 03E - 409765 03N

Water Strikes  
 No Groundwater Encountered

Legend  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

## Remarks

Borehole logs compiled from driller's descriptions  
 Moderate (30%) flush loss reported between 5.3 and 6.1m bgl. Full flush return reported after 6.1m bgl.

Borehole:

RO2

## ROTARY BOREHOLE RECORD

North Gawber Colliery

Revision Final

Project No 07053

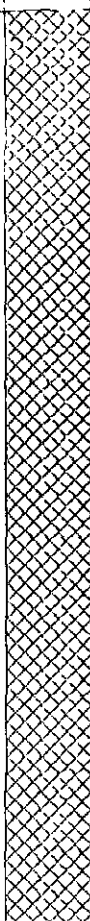
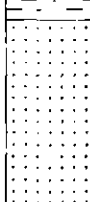


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## Strata

Sheet 1 of 2

Core Data / Samples

| Depth (m) | Legend                                                                              | Description                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%) | SCR (%) | RQC (%) | F | Depth (m) | Type | Installer |
|-----------|-------------------------------------------------------------------------------------|--------------------------------------------|------------------------------|----------------------|--------------|---------|---------|---------|---|-----------|------|-----------|
| 0.00      |   | MADE GROUND (Brick, ash and concrete fill) |                              |                      |              |         |         |         |   |           |      |           |
| 1.00      |                                                                                     |                                            |                              |                      |              |         |         |         |   |           |      |           |
| 2.00      |                                                                                     |                                            |                              |                      |              |         |         |         |   |           |      |           |
| 3.00      |                                                                                     |                                            | (6.00)                       |                      |              |         |         |         |   |           |      |           |
| 4.00      |                                                                                     |                                            |                              |                      |              |         |         |         |   |           |      |           |
| 5.00      |  | Brown CLAY                                 | 6.00                         | 80.30                |              |         |         |         |   |           |      |           |
| 6.00      |                                                                                     |                                            | (0.70)                       |                      |              |         |         |         |   |           |      |           |
| 7.00      |  | Yellow SANDSTONE                           | 6.70                         | 79.80                |              |         |         |         |   |           |      |           |
| 8.00      |                                                                                     |                                            | (2.70)                       |                      |              |         |         |         |   |           |      |           |
| 9.00      |  | COAL                                       | 9.40                         | 76.90                |              |         |         |         |   |           |      |           |
|           |                                                                                     | Continued next sheet                       | (0.70)                       |                      |              |         |         |         |   |           |      |           |

Start Date 24/10/2007  
 End Date 24/10/2007  
 Method Rotary open hole using Geotech 6 ng  
 Drilled By J B Site Investigations  
 Logged By D Hood  
 Ground Level 86.300 mAOD  
 Coordinates 433054 00E - 409749 00N

Water Strikes:  
 No Groundwater Encountered

Legend  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks  
 Borehole logs compiled from driller's descriptions  
 Full flush returns throughout drilling reported

Borehole:

RO3

## ROTARY BOREHOLE RECORD

North Gawber Colliery

Revision Final

Project No 07053



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| Depth (m) | Legend | Description                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%) | SCR (%) | RQD (%) | FI | Depth (m) | Type | Installer |
|-----------|--------|----------------------------|------------------------------|----------------------|--------------|---------|---------|---------|----|-----------|------|-----------|
|           |        | COAL                       | 10.10                        | 76.26                |              |         |         |         |    |           |      |           |
|           |        | Grey SANDSTONE             |                              |                      |              |         |         |         |    |           |      |           |
| 11.00     |        |                            | (1.80)                       |                      |              |         |         |         |    |           |      |           |
| 12.00     |        | End of Borehole at 12.00 m | 12.00                        | 74.30                |              |         |         |         |    |           |      |           |
| 13.00     |        |                            |                              |                      |              |         |         |         |    |           |      |           |
| 14.00     |        |                            |                              |                      |              |         |         |         |    |           |      |           |
| 15.00     |        |                            |                              |                      |              |         |         |         |    |           |      |           |
| 16.00     |        |                            |                              |                      |              |         |         |         |    |           |      |           |
| 17.00     |        |                            |                              |                      |              |         |         |         |    |           |      |           |
| 18.00     |        |                            |                              |                      |              |         |         |         |    |           |      |           |
| 19.00     |        |                            |                              |                      |              |         |         |         |    |           |      |           |

Start Date

24/10/2007

End Date

24/10/2007

Method

Rotary open hole using Geotech 6 rig

Drilled By

J B Site Investigations

Logged By

D Hood

Ground Level

86.300 mAOD

Coordinates

433054 00E - 409749 00N

Water Strikes

No Groundwater Encountered

Legend

D Small Disturbed Sample

B Large Disturbed Sample

U Undisturbed U100 Sample

W Water Sample

S Standard Penetration Test (Split Spoon)

C Standard Penetration Test (Cone)

Remarks

Borehole logs compiled from driller's descriptions

Full flush returns throughout drilling reported

Borehole:

RO3

ROTARY BOREHOLE RECORD

North Gawber Colliery

Revision

Final

Project No.

07053



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| Depth (m) | Legend | Description                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCF (%) | SCR (%) | RQD (%) | FI | Depth (m) | Type | Installation |
|-----------|--------|--------------------------------------------|------------------------------|----------------------|--------------|---------|---------|---------|----|-----------|------|--------------|
|           |        | MADE GROUND (Grey colliery fill and brick) |                              |                      |              |         |         |         |    |           |      |              |
| 1.00      |        |                                            |                              |                      |              |         |         |         |    |           |      |              |
| 2.00      |        |                                            | (4.10)                       |                      |              |         |         |         |    |           |      |              |
| 3.00      |        |                                            |                              |                      |              |         |         |         |    |           |      |              |
| 4.00      |        | Yellow SANDSTONE                           | 4.10                         | 82.20                |              |         |         |         |    |           |      |              |
| 5.00      |        |                                            |                              |                      |              |         |         |         |    |           |      |              |
| 6.00      |        |                                            | (4.80)                       |                      |              |         |         |         |    |           |      |              |
| 7.00      |        |                                            |                              |                      |              |         |         |         |    |           |      |              |
| 8.00      |        |                                            |                              |                      |              |         |         |         |    |           |      |              |
| 9.00      |        | Grey MUDSTONE                              | 8.90                         | 77.40                |              |         |         |         |    |           |      |              |
|           |        | Continued next sheet                       |                              |                      |              |         |         |         |    |           |      |              |

Start Date 24/10/2007  
 End Date 24/10/2007  
 Method Rotary open hole using Geotech 6 ng  
 Drilled By J.B. Site Investigations  
 Logged By D. Hood  
 Ground Level 86.303 mAOD  
 Coordinates 433090 OCE - 408720 OCN

Water Strikes  
 No Groundwater Encountered

Legend  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U1C3 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks  
 Borehole logs compiled from driller's descriptions  
 Full flush returns throughout drilling reported

Borehole:

RO4

## ROTARY BOREHOLE RECORD

North Gawber Colliery

Revision Final

Project No 07053



S C O T T  
 DOHERTY  
 ASSOCIATES



[illegible]

| Strata                                                                                                                                                                                                                            |        |                                   | Sheet 1 of 2                                 |                      | Core Data / Samples |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------|----------------------------------------------|----------------------|---------------------|-------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------------------------------------|------|--------------|
| Depth (m)                                                                                                                                                                                                                         | Legend | Description                       | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m)        | TCR (%)     | SCR (%) | RDD (%)                                                                                                                                                                                           | FI | Depth (m)                                                                                                         | Type | Installation |
|                                                                                                                                                                                                                                   |        | MADE GROUND (Concrete).           | (0.40)                                       | 86.00                |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
|                                                                                                                                                                                                                                   |        | MADE GROUND (Brick and ash fill). |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 1.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 2.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 3.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 4.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 5.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 6.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 7.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 8.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| 9.00                                                                                                                                                                                                                              |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
|                                                                                                                                                                                                                                   |        | Continued next sheet              |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| Start Date: 24/10/2007<br>End Date: 24/10/2007<br>Method: Rotary open hole using Geotech 6 ng.<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 86.400 mAOD<br>Coordinates: 433071.00E - 409686.00N |        |                                   | Water Strikes:<br>No Groundwater Encountered |                      |                     |             |         | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |    |                                                                                                                   |      |              |
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Full flush returns throughout drilling reported.                                                                                                               |        |                                   |                                              |                      |                     |             |         |                                                                                                                                                                                                   |    |                                                                                                                   |      |              |
| Borehole:                                                                                                                                                                                                                         |        | ROTARY BOREHOLE RECORD            |                                              |                      |                     | Revision:   |         | Final                                                                                                                                                                                             |    | <br>SCOTT DOHERTY ASSOCIATES |      |              |
| R05                                                                                                                                                                                                                               |        | North Gawber Colliery             |                                              |                      |                     | Project No. |         | 07053                                                                                                                                                                                             |    |                                                                                                                   |      |              |

| Strata                                                                                                                                                                                                                  |        | Sheet 2 of 2                                    |                                              | Core Data / Samples  |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------|----------------------------------------------|----------------------|--------------|------------------|---------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|--------------|
| Depth (m)                                                                                                                                                                                                               | Legend | Description                                     | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)          | SCR (%) | RQD (%)                                                                                                           | FI                                                                                                                                                                                               | Depth (m) | Type | Installation |
| 11.00                                                                                                                                                                                                                   |        | Brown and grey SANDSTONE with bands of MUDSTONE |                                              |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 12.00                                                                                                                                                                                                                   |        |                                                 |                                              |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 13.00                                                                                                                                                                                                                   |        |                                                 | (6.80)                                       |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 14.00                                                                                                                                                                                                                   |        |                                                 |                                              |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 15.00                                                                                                                                                                                                                   |        |                                                 |                                              |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 16.00                                                                                                                                                                                                                   |        | COAL                                            | 16.10                                        | 70.90                |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 17.00                                                                                                                                                                                                                   |        |                                                 | (1.00)                                       |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 18.00                                                                                                                                                                                                                   |        | Grey MUDSTONE                                   | 17.10                                        | 69.90                |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| 19.00                                                                                                                                                                                                                   |        |                                                 | (1.90)                                       |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
|                                                                                                                                                                                                                         |        | End of Borehole at 19.00 m                      | 19.00                                        | 68.00                |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| Start Date 24/10/2007<br>End Date 24/10/2007<br>Method Rotary open hole using Geotech 6 ng<br>Drilled By J B Site Investigations<br>Logged By D Hood<br>Ground Level 87 000 mAOD<br>Coordinates 433136 00E - 409689 00N |        |                                                 | Water Strikes:<br>No Groundwater Encountered |                      |              |                  |         |                                                                                                                   | Legend<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |      |              |
| Remarks<br>Borehole logs compiled from driller's descriptions<br>Full flush returns throughout drilling reported                                                                                                        |        |                                                 |                                              |                      |              |                  |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |
| Borehole: RO6                                                                                                                                                                                                           |        | ROTARY BOREHOLE RECORD                          |                                              |                      |              | Revision Final   |         | <br>SCOTT DOHERTY ASSOCIATES |                                                                                                                                                                                                  |           |      |              |
|                                                                                                                                                                                                                         |        | North Gawber Colliery                           |                                              |                      |              | Project No 07053 |         |                                                                                                                   |                                                                                                                                                                                                  |           |      |              |

| Strata    |        |                                             |                              |                      | Sheet 1 of 1 |         | Core Data / Samples |         |    |           |      |              |  |
|-----------|--------|---------------------------------------------|------------------------------|----------------------|--------------|---------|---------------------|---------|----|-----------|------|--------------|--|
| Depth (m) | Legend | Description                                 | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%) | SCR (%)             | ROD (%) | FI | Depth (m) | Type | Installation |  |
| 1.00      |        | MADE GROUND (Concrete, brick and ash fill). | (1.10)                       |                      |              |         |                     |         |    |           |      |              |  |
|           |        | MADE GROUND (Ash fill).                     | 1.10                         | 77.30                |              |         |                     |         |    |           |      |              |  |
| 2.00      |        |                                             | (0.90)                       |                      |              |         |                     |         |    |           |      |              |  |
|           |        | Brown CLAY.                                 | 2.00                         | 76.40                |              |         |                     |         |    |           |      |              |  |
| 3.00      |        |                                             | (1.50)                       |                      |              |         |                     |         |    |           |      |              |  |
|           |        |                                             | 3.50                         | 74.90                |              |         |                     |         |    |           |      |              |  |
| 4.00      |        | Brown weathered SILTSTONE.                  | (1.10)                       |                      |              |         |                     |         |    |           |      |              |  |
|           |        |                                             | 4.50                         | 73.80                |              |         |                     |         |    |           |      |              |  |
| 5.00      |        | Soft COAL.                                  | (0.80)                       |                      |              |         |                     |         |    |           |      |              |  |
|           |        |                                             | 5.40                         | 73.00                |              |         |                     |         |    |           |      |              |  |
| 6.00      |        | Grey MUDSTONE.                              | (2.10)                       |                      |              |         |                     |         |    |           |      |              |  |
|           |        |                                             | 7.50                         | 70.90                |              |         |                     |         |    |           |      |              |  |
| 7.00      |        |                                             |                              |                      |              |         |                     |         |    |           |      |              |  |
|           |        | End of Borehole at 7.50 m                   |                              |                      |              |         |                     |         |    |           |      |              |  |
| 8.00      |        |                                             |                              |                      |              |         |                     |         |    |           |      |              |  |
| 9.00      |        |                                             |                              |                      |              |         |                     |         |    |           |      |              |  |

|                                                                                                                                                                                                                                  |                                              |                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start Date: 24/10/2007<br>End Date: 24/10/2007<br>Method: Rotary open hole using Geotech 6 ng<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 78.400 mAOD<br>Coordinates: 433090.00E - 409615.00N | Water Strikes:<br>No Groundwater Encountered | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                           |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Moderate (30%) flush loss reported between 4.6 and 5.4m bgl. Full flush returns reported after 5.4m bgl.<br>Rods dropped without rotation in soft coal |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

|                             |                               |                   |
|-----------------------------|-------------------------------|-------------------|
| Borehole:<br><br><b>RO7</b> | <b>ROTARY BOREHOLE RECORD</b> | Revision: Final   |
|                             | North Gawber Colliery         | Project No. 07053 |



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| Strata    |        |                                  | Sheet 1 of 2                 |                      | Core Data / Samples |         |         |         |    |           |      |              |
|-----------|--------|----------------------------------|------------------------------|----------------------|---------------------|---------|---------|---------|----|-----------|------|--------------|
| Depth (m) | Legend | Description                      | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m)        | TCR (%) | SCR (%) | ROD (%) | FI | Depth (m) | Type | Installation |
| 0.00      |        | MADE GROUND (Buck and ash fill). |                              |                      |                     |         |         |         |    |           |      |              |
| 1.00      |        |                                  |                              |                      |                     |         |         |         |    |           |      |              |
| 2.00      |        |                                  |                              |                      |                     |         |         |         |    |           |      |              |
| 3.00      |        |                                  |                              |                      |                     |         |         |         |    |           |      |              |
| 4.00      |        |                                  |                              |                      |                     |         |         |         |    |           |      |              |
| 5.00      |        |                                  |                              |                      |                     |         |         |         |    |           |      |              |
| 5.30      |        |                                  |                              | 5.30                 | 78.20               |         |         |         |    |           |      |              |
| 5.60      |        |                                  | Brown CLAY.                  | (0.30)<br>5.60       | 77.90               |         |         |         |    |           |      |              |
| 6.00      |        |                                  | Weathered brown SILTSTONE.   | (0.40)<br>6.00       | 77.50               |         |         |         |    |           |      |              |
| 6.40      |        |                                  | Yellow SANDSTONE.            |                      |                     |         |         |         |    |           |      |              |
| 7.00      |        |                                  | (1.90)                       |                      |                     |         |         |         |    |           |      |              |
| 7.90      |        |                                  | 7.90                         | 75.60                |                     |         |         |         |    |           |      |              |
| 8.00      |        | Grey MUDSTONE.                   |                              |                      |                     |         |         |         |    |           |      |              |
| 8.80      |        |                                  | (1.80)                       |                      |                     |         |         |         |    |           |      |              |
| 9.50      |        |                                  | 9.50                         | 74.00                |                     |         |         |         |    |           |      |              |
| 10.00     |        |                                  | Brown SANDSTONE.             | (0.50)<br>10.00      | 73.50               |         |         |         |    |           |      |              |
|           |        | Continued next sheet             |                              |                      |                     |         |         |         |    |           |      |              |

|                                                                                                                                                                                                                                    |                                              |                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start Date: 24/10/2007<br>End Date: 24/10/2007<br>Method: Rotary open hole using Geotech 6 rig.<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 83.500 mAOD<br>Coordinates: 433150.00E - 409660.00N | Water Strikes:<br>No Groundwater Encountered | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                    |  |  |
|--------------------------------------------------------------------------------------------------------------------|--|--|
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Full flush returns throughout drilling reported |  |  |
|--------------------------------------------------------------------------------------------------------------------|--|--|

|                      |                        |                   |
|----------------------|------------------------|-------------------|
| Borehole:<br><br>RO8 | ROTARY BOREHOLE RECORD | Revision: Final   |
|                      | North Gawber Colliery  | Project No. 07053 |



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| Strata    |        | Sheet 2 of 2                           |                              | Core Data / Samples  |              |         |         |         |    |           |      |              |
|-----------|--------|----------------------------------------|------------------------------|----------------------|--------------|---------|---------|---------|----|-----------|------|--------------|
| Depth (m) | Legend | Description                            | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%) | SCR (%) | ROD (%) | FI | Depth (m) | Type | Installation |
| 11.00     | xxxxxx | Grey MUDSTONE with bands of SANDSTONE. |                              |                      |              |         |         |         |    |           |      |              |
| 12.00     | xxxxxx |                                        | (4.00)                       |                      |              |         |         |         |    |           |      |              |
| 13.00     | xxxxxx |                                        |                              |                      |              |         |         |         |    |           |      |              |
| 14.00     | xxxxxx |                                        | 14.00                        | 69.50                |              |         |         |         |    |           |      |              |
|           | xxxxxx | COAL.                                  | (0.50)                       |                      |              |         |         |         |    |           |      |              |
|           | xxxxxx |                                        | 14.50                        | 69.00                |              |         |         |         |    |           |      |              |
| 15.00     | xxxxxx | Grey MUDSTONE.                         |                              |                      |              |         |         |         |    |           |      |              |
| 16.00     | xxxxxx |                                        | (2.00)                       |                      |              |         |         |         |    |           |      |              |
|           | xxxxxx |                                        | 16.50                        | 67.00                |              |         |         |         |    |           |      |              |
| 17.00     |        | End of Borehole at 16.50 m             |                              |                      |              |         |         |         |    |           |      |              |
| 18.00     |        |                                        |                              |                      |              |         |         |         |    |           |      |              |
| 19.00     |        |                                        |                              |                      |              |         |         |         |    |           |      |              |

Start Date: 24/10/2007  
 End Date: 24/10/2007  
 Method: Rotary open hole using Geotech 6 ng.  
 Drilled By: J.B. Site Investigations  
 Logged By: D. Hood  
 Ground Level: 83.500 mAOD  
 Coordinates: 433150.00E - 409650.00N

Water Strikes:  
 No Groundwater Encountered

Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks:

Borehole logs compiled from driller's descriptions  
 Full flush returns throughout drilling reported.

|                      |                        |                   |
|----------------------|------------------------|-------------------|
| Borehole:<br><br>RO8 | ROTARY BOREHOLE RECORD | Revision: Final   |
|                      | North Gawber Colliery  | Project No. 07053 |



| Strata    |        | Sheet 1 of 2                           |                              | Core Data / Samples  |              |         |         |         |    |           |      |              |
|-----------|--------|----------------------------------------|------------------------------|----------------------|--------------|---------|---------|---------|----|-----------|------|--------------|
| Depth (m) | Legend | Description                            | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%) | SCR (%) | RQD (%) | FI | Depth (m) | Type | Installation |
| 1.00      |        | MADE GROUND (Brick and ash fill).      |                              |                      |              |         |         |         |    |           |      |              |
| 2.00      |        |                                        | (4.20)                       |                      |              |         |         |         |    |           |      |              |
| 3.00      |        |                                        |                              |                      |              |         |         |         |    |           |      |              |
| 4.00      |        |                                        | 4.20                         | 74.40                |              |         |         |         |    |           |      |              |
| 5.00      |        | Weathered brown SILTSTONE.             | (0.80)                       |                      |              |         |         |         |    |           |      |              |
|           |        |                                        | 5.00                         | 73.60                |              |         |         |         |    |           |      |              |
| 6.00      |        | Yellow SANDSTONE.                      | (1.80)                       |                      |              |         |         |         |    |           |      |              |
|           |        |                                        | 6.80                         | 71.80                |              |         |         |         |    |           |      |              |
| 7.00      |        | Grey MUDSTONE with bands of SANDSTONE. |                              |                      |              |         |         |         |    |           |      |              |
| 8.00      |        |                                        | (2.80)                       |                      |              |         |         |         |    |           |      |              |
| 9.00      |        |                                        |                              |                      |              |         |         |         |    |           |      |              |
|           |        |                                        | 9.60                         | 69.00                |              |         |         |         |    |           |      |              |
|           |        | COAL.                                  | (0.30)                       |                      |              |         |         |         |    |           |      |              |
|           |        | Continued next sheet                   | 9.90                         | 68.70                |              |         |         |         |    |           |      |              |

Start Date: 25/10/2007  
 End Date: 25/10/2007  
 Method: Rotary open hole using Geotech 6 ng  
 Drilled By: J.B. Site Investigations  
 Logged By: D. Hood  
 Ground Level: 78.600 mAOD  
 Coordinates: 433206.00E - 409591.00N

Water Strikes:  
 No Groundwater Encountered

Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks:  
 Borehole logs compiled from driller's descriptions.  
 Full flush returns throughout drilling reported.

|                      |                        |                   |                              |
|----------------------|------------------------|-------------------|------------------------------|
| Borehole:<br><br>RO9 | ROTARY BOREHOLE RECORD | Revision: Final   | <br>SCOTT O'HERTY ASSOCIATES |
|                      | North Gawber Colliery  | Project No. 07053 |                              |

| Strata                                                                                                                                                                                                                            |        |                            |                                              | Sheet 2 of 2         |              | Core Data / Samples |                   |         |                                                                                                                                                                                                   |           |      |              |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------|----------------------------------------------|----------------------|--------------|---------------------|-------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|--------------|--|
| Depth (m)                                                                                                                                                                                                                         | Legend | Description                | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)             | SCR (%)           | RQD (%) | FI                                                                                                                                                                                                | Depth (m) | Type | Installation |  |
| 11.00                                                                                                                                                                                                                             | xxxxxx | Grey MUDSTONE              | (2.10)                                       |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 12.00                                                                                                                                                                                                                             | xxxxxx | End of Borehole at 12.00 m | 12.00                                        | 86.60                |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 13.00                                                                                                                                                                                                                             |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 14.00                                                                                                                                                                                                                             |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 15.00                                                                                                                                                                                                                             |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 16.00                                                                                                                                                                                                                             |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 17.00                                                                                                                                                                                                                             |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 18.00                                                                                                                                                                                                                             |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| 19.00                                                                                                                                                                                                                             |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 ng.<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 78.600 mAOD<br>Coordinates: 433206.00E - 409591.00N |        |                            | Water Strikes:<br>No Groundwater Encountered |                      |              |                     |                   |         | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |      |              |  |
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Full flush returns throughout drilling reported.                                                                                                               |        |                            |                                              |                      |              |                     |                   |         |                                                                                                                                                                                                   |           |      |              |  |
| Borehole: RO9                                                                                                                                                                                                                     |        | ROTARY BOREHOLE RECORD     |                                              |                      |              |                     | Revision: Final   |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                   |        | North Gawber Colliery      |                                              |                      |              |                     | Project No. 07053 |         |                                                                                                                                                                                                   |           |      |              |  |



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| Strata                                                                                                                                                                                                                    |        |                                                            |                                             | Sheet 1 of 3         |              | Core Data / Samples |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------|---------------------------------------------|----------------------|--------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|-------------------------------------|------|--------------|--|
| Depth (m)                                                                                                                                                                                                                 | Legend | Description                                                | Strata Depth (Thickness) (m)                | Reduced Level (mAOD) | Core Run (m) | TCR (%)             | SCR (%)                                                                                                                                                                                           | ROD (%)           | FI | Depth (m)                           | Type | Installation |  |
| 1.00                                                                                                                                                                                                                      |        | MADE GROUND (Brck and ash fill).                           | (2.10)                                      |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 2.00                                                                                                                                                                                                                      |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 3.00                                                                                                                                                                                                                      |        | Brown CLAY                                                 | (1.80)                                      | 83.40                |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 4.00                                                                                                                                                                                                                      |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 5.00                                                                                                                                                                                                                      |        | Yellow SANDSTONE with bands of brown SILTSTONE             | (2.20)                                      | 81.80                |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 6.00                                                                                                                                                                                                                      |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 7.00                                                                                                                                                                                                                      |        | Grey MUDSTONE                                              | (1.10)                                      | 79.40                |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 8.00                                                                                                                                                                                                                      |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| 9.00                                                                                                                                                                                                                      |        | Brown SANDSTONE.                                           | (1.90)                                      | 78.30                |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
|                                                                                                                                                                                                                           |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
|                                                                                                                                                                                                                           |        | Grey MUDSTONE with bands of SANDSTONE                      |                                             | 76.40                |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
|                                                                                                                                                                                                                           |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| Continued next sheet                                                                                                                                                                                                      |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| Start Date 25/10/2007<br>End Date 25/10/2007<br>Method Rotary open hole using Geotech 5 ng<br>Drilled By J.B. Site Investigations<br>Logged By D. Hood<br>Ground Level 85.500 mAOD<br>Coordinates 433260.00E - 409675.00N |        |                                                            | Water Strikes<br>No Groundwater Encountered |                      |              |                     | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |                   |    |                                     |      |              |  |
| Remarks<br>Borehole logs compiled from online descriptions<br>Full flush returns throughout drilling reported                                                                                                             |        |                                                            |                                             |                      |              |                     |                                                                                                                                                                                                   |                   |    |                                     |      |              |  |
| Borehole<br><b>RO10</b>                                                                                                                                                                                                   |        | <b>ROTARY BOREHOLE RECORD</b><br><br>North Gawber Colliery |                                             |                      |              | Revision: Final     |                                                                                                                                                                                                   | Project No. 07053 |    | <br><b>SCOTT DOHERTY ASSOCIATES</b> |      |              |  |

| Strata                                                                                                                                                                                                                             |        | Sheet 2 of 3                           |                                              | Core Data / Samples  |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------|----------------------------------------------|----------------------|--------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----|-----------|------|--------------|
| Depth (m)                                                                                                                                                                                                                          | Legend | Description                            | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)           | SCR (%)                                                                                                                                                                                           | RQD (%)                                                                                                           | FI | Depth (m) | Type | Installation |
| 11.00                                                                                                                                                                                                                              | xxxxxx | Grey MUDSTONE with bands of SANDSTONE. |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 12.00                                                                                                                                                                                                                              | xxxxxx |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 13.00                                                                                                                                                                                                                              | xxxxxx |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 14.00                                                                                                                                                                                                                              | xxxxxx |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 15.00                                                                                                                                                                                                                              | xxxxxx |                                        | (11.90)                                      |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 16.00                                                                                                                                                                                                                              | xxxxxx |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 17.00                                                                                                                                                                                                                              | xxxxxx |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 18.00                                                                                                                                                                                                                              | xxxxxx |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| 19.00                                                                                                                                                                                                                              | xxxxxx |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
|                                                                                                                                                                                                                                    | xxxxxx | Continued next sheet                   |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 rig.<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 85.500 mAOD<br>Coordinates: 433260.00E - 409675.00N |        |                                        | Water Strikes:<br>No Groundwater Encountered |                      |              |                   | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |                                                                                                                   |    |           |      |              |
| Remarks:<br>Borehole logs compiled from driller's descriptions<br>Full flush returns throughout drilling reported.                                                                                                                 |        |                                        |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
| Borehole:                                                                                                                                                                                                                          |        | ROTARY BOREHOLE RECORD                 |                                              |                      |              | Revision: Final   |                                                                                                                                                                                                   | <br>SCOTT DOHERTY ASSOCIATES |    |           |      |              |
| RO10                                                                                                                                                                                                                               |        |                                        |                                              |                      |              | Project No. 07053 |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |
|                                                                                                                                                                                                                                    |        | North Gawber Colliery                  |                                              |                      |              |                   |                                                                                                                                                                                                   |                                                                                                                   |    |           |      |              |

| Strata    |        | Sheet 3 of 3                           |                              |                      | Core Data / Samples |         |         |         |    |           |      |              |
|-----------|--------|----------------------------------------|------------------------------|----------------------|---------------------|---------|---------|---------|----|-----------|------|--------------|
| Depth (m) | Legend | Description                            | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m)        | TCR (%) | SCR (%) | RQD (%) | FI | Depth (m) | Type | Installation |
| 21.00     | XXXXXX | Gray MUDSTONE with bands of SANDSTONE. | 21.00                        | 64.50                |                     |         |         |         |    |           |      |              |
| 22.00     | XXXXXX | Gray MUDSTONE.                         | (1.10)                       |                      |                     |         |         |         |    |           |      |              |
| 23.00     | XXXXXX | COAL.                                  | 22.10                        | 63.40                |                     |         |         |         |    |           |      |              |
| 24.00     | XXXXXX | Gray MUDSTONE.                         | (0.30)                       | 63.10                |                     |         |         |         |    |           |      |              |
| 25.00     | XXXXXX | Gray MUDSTONE.                         | 22.40                        |                      |                     |         |         |         |    |           |      |              |
| 26.00     | XXXXXX | COAL.                                  | (0.80)                       |                      |                     |         |         |         |    |           |      |              |
| 27.00     | XXXXXX | Gray MUDSTONE.                         | 23.20                        | 62.30                |                     |         |         |         |    |           |      |              |
| 28.00     | XXXXXX | COAL.                                  | (1.00)                       |                      |                     |         |         |         |    |           |      |              |
| 29.00     | XXXXXX | Gray MUDSTONE.                         | 24.20                        | 61.30                |                     |         |         |         |    |           |      |              |
| 30.00     | XXXXXX | Gray MUDSTONE.                         | (1.80)                       |                      |                     |         |         |         |    |           |      |              |
| 31.00     | XXXXXX | End of Borehole at 26.00 m             | 26.00                        | 59.50                |                     |         |         |         |    |           |      |              |

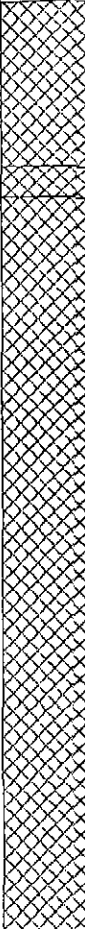
Start Date: 25/10/2007  
 End Date: 25/10/2007  
 Method: Rotary open hole using Geotech 6 ng.  
 Drilled By: J.B. Site Investigations  
 Logged By: D. Hood  
 Ground Level: 85.500 mAOD  
 Coordinates: 433260.00E - 409675.00N

Water Strikes:  
 No Groundwater Encountered

Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks:  
 Borehole logs compiled from driller's descriptions.  
 Full flush returns throughout drilling reported.

|                       |                        |                   |                                                                                                                   |
|-----------------------|------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|
| Borehole:<br><br>RO10 | ROTARY BOREHOLE RECORD | Revision: Final   | <br>SCOTT DOHERTY ASSOCIATES |
|                       | North Gawber Colliery  | Project No. 07053 |                                                                                                                   |

| Strata    |                                                                                     |                                            |                              |                      | Sheet 1 of 1 |         | Core Data / Samples |         |    |           |      |              |  |
|-----------|-------------------------------------------------------------------------------------|--------------------------------------------|------------------------------|----------------------|--------------|---------|---------------------|---------|----|-----------|------|--------------|--|
| Depth (m) | Legend                                                                              | Description                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%) | SCR (%)             | RQD (%) | FI | Depth (m) | Type | Installation |  |
|           |   | MADE GROUND (Brck and ash fill).           | (1.10)                       |                      |              |         |                     |         |    |           |      |              |  |
| 1.00      |                                                                                     |                                            | 1.10                         | 85.40                |              |         |                     |         |    |           |      |              |  |
|           |                                                                                     | MADE GROUND (Concrete).                    | 1.30                         | 85.20                |              |         |                     |         |    |           |      |              |  |
|           |                                                                                     | MADE GROUND (Brck, ash and concrete fill). |                              |                      |              |         |                     |         |    |           |      |              |  |
| 2.00      |                                                                                     |                                            |                              |                      |              |         |                     |         |    |           |      |              |  |
| 3.00      |                                                                                     |                                            |                              |                      |              |         |                     |         |    |           |      |              |  |
| 4.00      |                                                                                     |                                            | (4.80)                       |                      |              |         |                     |         |    |           |      |              |  |
| 5.00      |                                                                                     |                                            |                              |                      |              |         |                     |         |    |           |      |              |  |
| 6.00      |                                                                                     |                                            | 6.10                         | 89.40                |              |         |                     |         |    |           |      |              |  |
|           |  | Light brown CLAY.                          | (0.40)                       |                      |              |         |                     |         |    |           |      |              |  |
|           |                                                                                     |                                            | 6.50                         | 80.00                |              |         |                     |         |    |           |      |              |  |
| 7.00      |                                                                                     | End of Borehole at 6.50 m                  |                              |                      |              |         |                     |         |    |           |      |              |  |
| 8.00      |                                                                                     |                                            |                              |                      |              |         |                     |         |    |           |      |              |  |
| 9.00      |                                                                                     |                                            |                              |                      |              |         |                     |         |    |           |      |              |  |

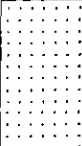
Start Date: 25/10/2007  
 End Date: 25/10/2007  
 Method: Rotary open hole using Geotech 6 ng.  
 Drilled By: J.E. Site Investigations  
 Logged By: D. Hood  
 Ground Level: 86.500 mAOD  
 Coordinates: 432937.00E - 409762.00N

Water Strikes:  
 No Groundwater Encountered

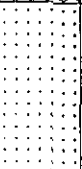
Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks:  
 Borehole logs compiled from driller's descriptions  
 Full flush returns throughout drilling reported

|                       |                        |                   |                                                                                                                   |
|-----------------------|------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|
| Borehole:<br><br>RO11 | ROTARY BOREHOLE RECORD | Revision: Final   | <br>SCOTT DOHERTY ASSOCIATES |
|                       | North Gawber Colliery  | Project No. 07053 |                                                                                                                   |

| Strata                                                                                                                                                                                                                             |                                                                                    |                                                    |                                              | Sheet 1 of 1         |              | Core Data / Samples |         |         |                                                                                                                                                                                                   |           |      |              |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------|----------------------|--------------|---------------------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|--------------|--|
| Depth (m)                                                                                                                                                                                                                          | Legend                                                                             | Description                                        | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)             | SCR (%) | ROD (%) | FI                                                                                                                                                                                                | Depth (m) | Type | Installation |  |
| -1.00                                                                                                                                                                                                                              |   | MADE GROUND (Brck and ash fill).                   |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -2.00                                                                                                                                                                                                                              |                                                                                    |                                                    | (3.10)                                       |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -3.00                                                                                                                                                                                                                              |                                                                                    |                                                    | 3.10                                         | 86.20                |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -4.00                                                                                                                                                                                                                              |  | MADE GROUND (Damp black silty claybound ash fill). |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                    |                                                                                    | (1.60)                                             |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                    |                                                                                    | 4.70                                               | 84.60                                        |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -5.00                                                                                                                                                                                                                              |                                                                                    | Yellow SANDSTONE.                                  |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                    |                                                                                    | (1.00)                                             |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                    |                                                                                    | End of Borehole at 5.70 m                          | 5.70                                         | 83.60                |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -6.00                                                                                                                                                                                                                              |                                                                                    |                                                    |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -7.00                                                                                                                                                                                                                              |                                                                                    |                                                    |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -8.00                                                                                                                                                                                                                              |                                                                                    |                                                    |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| -9.00                                                                                                                                                                                                                              |                                                                                    |                                                    |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 rig.<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 89.300 mAOD<br>Coordinates: 433023.00E - 409784.00N |                                                                                    |                                                    | Water Strikes:<br>No Groundwater Encountered |                      |              |                     |         |         | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |      |              |  |
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Full flush returns throughout drilling reported.                                                                                                                |                                                                                    |                                                    |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| Borehole:                                                                                                                                                                                                                          |                                                                                    | ROTARY BOREHOLE RECORD                             |                                              |                      |              | Revision: Final     |         |         | <br>SCOTT DOHERTY ASSOCIATES                                                                                 |           |      |              |  |
| RO12                                                                                                                                                                                                                               |                                                                                    |                                                    |                                              |                      |              | Project No. 07053   |         |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                    |                                                                                    | North Gawber Colliery                              |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |

| Strata                                                                                                                                                                                                                             |        |                            |                                              | Sheet 1 of 1         |              | Core Data / Samples |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------|----------------------------------------------|----------------------|--------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|-----------|------|--------------|
| Depth (m)                                                                                                                                                                                                                          | Legend | Description                | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)             | SCR (%)                                                                                                                                                                                           | RQD (%) | FI                                                                                    | Depth (m) | Type | Installation |
|                                                                                                                                                                                                                                    |        | MADE GROUND (Concrete)     | 0.20                                         | 87.70                |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
|                                                                                                                                                                                                                                    |        | MADE GROUND (Brck fill)    |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 1.00                                                                                                                                                                                                                               |        |                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 2.00                                                                                                                                                                                                                               |        |                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 3.00                                                                                                                                                                                                                               |        |                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 4.00                                                                                                                                                                                                                               |        |                            | (8.00)                                       |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 5.00                                                                                                                                                                                                                               |        |                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 6.00                                                                                                                                                                                                                               |        |                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 7.00                                                                                                                                                                                                                               |        |                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 8.00                                                                                                                                                                                                                               |        |                            | 8.20                                         | 79.70                |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| 9.00                                                                                                                                                                                                                               |        | Yellow SANDSTONE           | (1.80)                                       |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
|                                                                                                                                                                                                                                    |        |                            | 10.00                                        | 77.90                |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
|                                                                                                                                                                                                                                    |        | End of Borehole at 10.00 m |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 rig.<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 87.900 mAOD<br>Coordinates: 433161.00E - 409681.00N |        |                            | Water Strikes:<br>No Groundwater Encountered |                      |              |                     | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |         |                                                                                       |           |      |              |
| Remarks:<br>Borehole logs compiled from driller's descriptions<br>Full flush returns throughout drilling reported.                                                                                                                 |        |                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |
| Borehole: RO13                                                                                                                                                                                                                     |        | ROTARY BOREHOLE RECORD     |                                              |                      |              | Revision: Final     |                                                                                                                                                                                                   |         |  |           |      |              |
|                                                                                                                                                                                                                                    |        | North Gawber Colliery      |                                              |                      |              | Project No. 07053   |                                                                                                                                                                                                   |         |                                                                                       |           |      |              |

| Strata    |                                                                                   |                                            |                              | Sheet 1 of 1         |              | Core Data / Samples |         |         |    |           |      |              |  |
|-----------|-----------------------------------------------------------------------------------|--------------------------------------------|------------------------------|----------------------|--------------|---------------------|---------|---------|----|-----------|------|--------------|--|
| Depth (m) | Legend                                                                            | Description                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%)             | SCR (%) | RQD (%) | FI | Depth (m) | Type | Installation |  |
| 1.00      |  | MADE GROUND (Brck, ash and concrete fill). | (2.40)                       |                      |              |                     |         |         |    |           |      |              |  |
| 2.00      |                                                                                   |                                            | 2.40                         | 88.50                |              |                     |         |         |    |           |      |              |  |
| 3.00      |                                                                                   | Yellow SANDSTONE.                          | (1.10)                       |                      |              |                     |         |         |    |           |      |              |  |
|           |  |                                            | 3.50                         | 87.40                |              |                     |         |         |    |           |      |              |  |
| 4.00      |                                                                                   | End of Borehole at 3.50 m                  |                              |                      |              |                     |         |         |    |           |      |              |  |
| 5.00      |                                                                                   |                                            |                              |                      |              |                     |         |         |    |           |      |              |  |
| 6.00      |                                                                                   |                                            |                              |                      |              |                     |         |         |    |           |      |              |  |
| 7.00      |                                                                                   |                                            |                              |                      |              |                     |         |         |    |           |      |              |  |
| 8.00      |                                                                                   |                                            |                              |                      |              |                     |         |         |    |           |      |              |  |
| 9.00      |                                                                                   |                                            |                              |                      |              |                     |         |         |    |           |      |              |  |

Start Date: 25/10/2007  
 End Date: 25/10/2007  
 Method: Rotary open hole using Geotech 6 rig  
 Drilled By: J.B. Site Investigations  
 Logged By: D. Hood  
 Ground Level: 90.900 mAOD  
 Coordinates: 433186.00E - 409780.00N

Water Strikes:  
 No Groundwater Encountered

Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

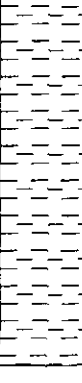
Remarks:  
 Borehole logs compiled from driller's descriptions.  
 Full flush returns throughout drilling reported.

|                       |                        |                   |
|-----------------------|------------------------|-------------------|
| Borehole:<br><br>R014 | ROTARY BOREHOLE RECORD | Revision: Final   |
|                       | North Gawber Colliery  | Project No. 07053 |



| Strata                                                                                                                                                                                                                           |        |                                            |                                              | Sheet 1 of 1         |              | Core Data / Samples |                                                                                                                                                                                                   |         |    |           |      |              |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------|----------------------------------------------|----------------------|--------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-----------|------|--------------|--|
| Depth (m)                                                                                                                                                                                                                        | Legend | Description                                | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)             | SCR (%)                                                                                                                                                                                           | RQD (%) | FI | Depth (m) | Type | Installation |  |
| 1.00                                                                                                                                                                                                                             |        | MADE GROUND (Brck, ash and concrete fill). | (3.90)                                       |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 2.00                                                                                                                                                                                                                             |        |                                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 3.00                                                                                                                                                                                                                             |        |                                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 4.00                                                                                                                                                                                                                             |        | Yellow SANDSTONE                           | 3.90                                         | 86.20                |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 5.00                                                                                                                                                                                                                             |        |                                            | (1.10)                                       |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 5.00                                                                                                                                                                                                                             |        | End of Borehole at 5.00 m                  | 5.00                                         | 85.10                |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 6.00                                                                                                                                                                                                                             |        |                                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 7.00                                                                                                                                                                                                                             |        |                                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 8.00                                                                                                                                                                                                                             |        |                                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| 9.00                                                                                                                                                                                                                             |        |                                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 ng.<br>Drilled By: J.B Site Investigations<br>Logged By: D. Hood<br>Ground Level: 80.100 mAOD<br>Coordinates: 433187.00E - 409733.00N |        |                                            | Water Strikes:<br>No Groundwater Encountered |                      |              |                     | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |         |    |           |      |              |  |
| Remarks:<br>Borehole logs compiled from driller's descriptions<br>Full flush returns throughout drilling reported                                                                                                                |        |                                            |                                              |                      |              |                     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| Borehole:                                                                                                                                                                                                                        |        | ROTARY BOREHOLE RECORD                     |                                              |                      |              | Revision: Final     |                                                                                                                                                                                                   |         |    |           |      |              |  |
| RO15                                                                                                                                                                                                                             |        | North Gawber Colliery                      |                                              |                      |              | Project No. 07053   |                                                                                                                                                                                                   |         |    |           |      |              |  |



| Strata                                                                                                                                                                                                                            |                                                                                     |                                            |                                              | Sheet 1 of 3         |              | Core Data / Samples |         |         |                                                                                                                                                                                                   |           |      |              |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------|----------------------|--------------|---------------------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|--------------|--|
| Depth (m)                                                                                                                                                                                                                         | Legend                                                                              | Description                                | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)             | SCR (%) | ROD (%) | FI                                                                                                                                                                                                | Depth (m) | Type | Installation |  |
| 1.00                                                                                                                                                                                                                              |   | MADE GROUND (Brck, ash and colliery fill). |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 2.00                                                                                                                                                                                                                              |                                                                                     |                                            |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 3.00                                                                                                                                                                                                                              |                                                                                     |                                            |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 4.00                                                                                                                                                                                                                              |                                                                                     |                                            | (7.60)                                       |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 5.00                                                                                                                                                                                                                              |                                                                                     |                                            |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 6.00                                                                                                                                                                                                                              |                                                                                     |                                            |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 7.00                                                                                                                                                                                                                              |                                                                                     |                                            |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 8.00                                                                                                                                                                                                                              |  | Brown CLAY.                                | 7.60                                         | 87.10                |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| 9.00                                                                                                                                                                                                                              |                                                                                     |                                            |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                   |                                                                                     | Continued next sheet                       | (2.50)                                       |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 rig<br>Drilled By: J.B. Site Investigations<br>Logged By: D. Hood<br>Ground Level: 94.700 mAOD<br>Coordinates: 432903.00E - 409803.00N |                                                                                     |                                            | Water Strikes:<br>No Groundwater Encountered |                      |              |                     |         |         | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |      |              |  |
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Heavy flush loss reported between 2.0 and 7.6m bgl. Full flush return reported after 7.6m bgl.                                                                 |                                                                                     |                                            |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |
| Borehole:                                                                                                                                                                                                                         |                                                                                     | ROTARY BOREHOLE RECORD                     |                                              |                      |              | Revision: Final     |         |         | <br>SCOTT DOHERTY ASSOCIATES                                                                                 |           |      |              |  |
| RO16                                                                                                                                                                                                                              |                                                                                     |                                            |                                              |                      |              | Project No. 07053   |         |         |                                                                                                                                                                                                   |           |      |              |  |
|                                                                                                                                                                                                                                   |                                                                                     | North Gawber Colliery                      |                                              |                      |              |                     |         |         |                                                                                                                                                                                                   |           |      |              |  |

| Depth (m) | Legend | Description                 | Strata Depth: (Thickness) (m) | Reduced Level (mAOD) | Core Run (m) | TCR (%) | SCR (%) | ROD (%) | FI | Depth (m) | Type | Installation |
|-----------|--------|-----------------------------|-------------------------------|----------------------|--------------|---------|---------|---------|----|-----------|------|--------------|
|           |        | Brown CLAY                  | 10.10                         | 84.60                |              |         |         |         |    |           |      |              |
|           |        | Yellow SANDSTONE            |                               |                      |              |         |         |         |    |           |      |              |
| 11.00     |        |                             | (2.10)                        |                      |              |         |         |         |    |           |      |              |
| 12.00     |        |                             |                               |                      |              |         |         |         |    |           |      |              |
|           |        | Grey MUDSTONE and SILTSTONE | 12.20                         | 82.50                |              |         |         |         |    |           |      |              |
| 13.00     |        |                             |                               |                      |              |         |         |         |    |           |      |              |
| 14.00     |        |                             |                               |                      |              |         |         |         |    |           |      |              |
| 15.00     |        |                             |                               |                      |              |         |         |         |    |           |      |              |
| 16.00     |        |                             | (7.90)                        |                      |              |         |         |         |    |           |      |              |
| 17.00     |        |                             |                               |                      |              |         |         |         |    |           |      |              |
| 18.00     |        |                             |                               |                      |              |         |         |         |    |           |      |              |
| 19.00     |        |                             |                               |                      |              |         |         |         |    |           |      |              |
|           |        | Continued next sheet        |                               |                      |              |         |         |         |    |           |      |              |

Start Date 25/10/2007  
 End Date 25/10/2007  
 Method Rotary open hole using Geotech 6 ng  
 Drilled By J.B. Site Investigations  
 Logged By D. Hood  
 Ground Level 94.700 mAOD  
 Coordinates 432903.00E - 409803.00N

Water Strikes:  
 No Groundwater Encountered

Legend  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

## Remarks

Borehole logs compiled from driller's descriptions  
 Heavy flush loss reported between 2.0 and 7.6m bgl. Full flush return reported after 7.6m bgl

Borehole:

RO16

## ROTARY BOREHOLE RECORD

North Gawber Colliery

Revision Final

Project No 07053



SCOTT  
DOHERTY  
ASSOCIATES

| Strata                                                                                                                                                                                                                             |        |                              |                                              | Sheet 3 of 3         |              | Core Data / Samples                                                                                                                                                                               |         |         |    |           |      |              |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|----------------------------------------------|----------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|----|-----------|------|--------------|--|
| Depth (m)                                                                                                                                                                                                                          | Legend | Description                  | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m) | TCR (%)                                                                                                                                                                                           | SCR (%) | RQD (%) | FI | Depth (m) | Type | Installation |  |
|                                                                                                                                                                                                                                    | *****  | Grey MUDSTONE and SILTSTONE. | 20.10                                        | 74.60                |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
|                                                                                                                                                                                                                                    |        | COAL.                        | (1.20)                                       |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 21.00                                                                                                                                                                                                                              |        |                              | 21.30                                        | 73.40                |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
|                                                                                                                                                                                                                                    | *****  | Grey MUDSTONE.               | (2.70)                                       |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 22.00                                                                                                                                                                                                                              |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 23.00                                                                                                                                                                                                                              |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 24.00                                                                                                                                                                                                                              |        | End of Borehole at 24.00 m   | 24.00                                        | 70.70                |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 25.00                                                                                                                                                                                                                              |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 26.00                                                                                                                                                                                                                              |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 27.00                                                                                                                                                                                                                              |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 28.00                                                                                                                                                                                                                              |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| 29.00                                                                                                                                                                                                                              |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 rig.<br>Drilled By: J.B. Sile Investigations<br>Logged By: D. Hood<br>Ground Level: 94.700 mAOD<br>Coordinates: 432903.00E - 409803.00N |        |                              | Water Strikes:<br>No Groundwater Encountered |                      |              | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |         |         |    |           |      |              |  |
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Heavy flush loss reported between 2.0 and 7.6m bgl. Full flush return reported after 7.6m bgl.                                                                  |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |
| Borehole:                                                                                                                                                                                                                          |        | ROTARY BOREHOLE RECORD       |                                              |                      |              | Revision: Final                                                                                                                                                                                   |         |         |    |           |      |              |  |
| RO16                                                                                                                                                                                                                               |        | North Gawber Colliery        |                                              |                      |              | Project No. 07053                                                                                                                                                                                 |         |         |    |           |      |              |  |
|                                                                                                                                               |        |                              |                                              |                      |              |                                                                                                                                                                                                   |         |         |    |           |      |              |  |

| Strata                                                                                                                                                                                                                    |        |                                      | Sheet 1 of 2                                        |                      | Core Data / Samples |         |         |         |                                                                                                                                                                                                  |           |      |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------|-----------------------------------------------------|----------------------|---------------------|---------|---------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|--------------|
| Depth (m)                                                                                                                                                                                                                 | Legend | Description                          | Strata Depth (Thickness) (m)                        | Reduced Level (mAOD) | Core Run (m)        | TCR (%) | SCR (%) | RQD (%) | FI                                                                                                                                                                                               | Depth (m) | Type | Installation |
| 1.00                                                                                                                                                                                                                      |        | MADE GROUND (Ash and colliery fill). |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 2.00                                                                                                                                                                                                                      |        |                                      |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 3.00                                                                                                                                                                                                                      |        |                                      |                                                     | (6.40)               |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 4.00                                                                                                                                                                                                                      |        |                                      |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 5.00                                                                                                                                                                                                                      |        |                                      |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 6.00                                                                                                                                                                                                                      |        |                                      |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 7.00                                                                                                                                                                                                                      |        | Yellow SANDSTONE                     | 6.40                                                | 89.70                |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 8.00                                                                                                                                                                                                                      |        |                                      |                                                     | (3.40)               |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| 9.00                                                                                                                                                                                                                      |        |                                      |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
|                                                                                                                                                                                                                           |        | Continued next sheet                 | 9.80                                                | 86.30                |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| Start Date 25/10/2007<br>End Date 25/10/2007<br>Method Rotary open hole using Geotech 6 ng<br>Drilled By J.B. Site Investigations<br>Logged By D. Hood<br>Ground Level 96.100 mAOD<br>Coordinates 432993.00E - 409839.00N |        |                                      | Water Strikes<br>No Groundwater Encountered         |                      |                     |         |         |         | Legend<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |      |              |
| Remarks<br>Borehole logs compiled from driller's descriptions<br>Full flush returns throughout drilling reported                                                                                                          |        |                                      |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |
| Borehole:<br><br>RO17                                                                                                                                                                                                     |        |                                      | ROTARY BOREHOLE RECORD<br><br>North Gawber Colliery |                      |                     |         |         |         | Revision Final<br><br>Project No. 07053                                                                                                                                                          |           |      |              |
|                                                                                                                                                                                                                           |        |                                      |                                                     |                      |                     |         |         |         |                                                                                                                                                                                                  |           |      |              |

| Strata                                                                                                                                                                                                                            |            |                                             | Sheet 2 of 2                                 |                      | Core Data / Samples |         |         |         |                                                                                                                                                                                                   |           |      |              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------|----------------------------------------------|----------------------|---------------------|---------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|--------------|
| Depth (m)                                                                                                                                                                                                                         | Legend     | Description                                 | Strata Depth (Thickness) (m)                 | Reduced Level (mAOD) | Core Run (m)        | TCR (%) | SCR (%) | ROD (%) | FI                                                                                                                                                                                                | Depth (m) | Type | Installation |
| 11.00                                                                                                                                                                                                                             | XXXXXXXXXX | Grey MUDSTONE with bands of SANDSTONE.      |                                              |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 12.00                                                                                                                                                                                                                             | XXXXXXXXXX |                                             | (3.40)                                       |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 13.00                                                                                                                                                                                                                             | XXXXXXXXXX |                                             | 13.20                                        | 82.90                |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
|                                                                                                                                                                                                                                   |            | COAL                                        | (0.30)                                       | 82.60                |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 14.00                                                                                                                                                                                                                             | XXXXXXXXXX | Grey MUDSTONE                               |                                              |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 15.00                                                                                                                                                                                                                             | XXXXXXXXXX |                                             | (2.00)                                       |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 16.00                                                                                                                                                                                                                             | XXXXXXXXXX |                                             | 15.50                                        | 80.60                |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 17.00                                                                                                                                                                                                                             | XXXXXXXXXX | Grey MUDSTONE with bands of grey SILTSTONE. |                                              |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 18.00                                                                                                                                                                                                                             | XXXXXXXXXX |                                             | (4.50)                                       |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| 19.00                                                                                                                                                                                                                             | XXXXXXXXXX |                                             |                                              |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
|                                                                                                                                                                                                                                   |            | End of Borehole at 20.00 m                  | 20.00                                        | 76.10                |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| Start Date: 25/10/2007<br>End Date: 25/10/2007<br>Method: Rotary open hole using Geotech 6 rig<br>Drilled By: J.B. Site investigations<br>Logged By: D. Hood<br>Ground Level: 95.100 mAOD<br>Coordinates: 432993.00E - 409839.00N |            |                                             | Water Strikes:<br>No Groundwater Encountered |                      |                     |         |         |         | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |      |              |
| Remarks:<br>Borehole logs compiled from driller's descriptions.<br>Full flush returns throughout drilling reported.                                                                                                               |            |                                             |                                              |                      |                     |         |         |         |                                                                                                                                                                                                   |           |      |              |
| Borehole:<br><b>RO17</b>                                                                                                                                                                                                          |            |                                             | <b>ROTARY BOREHOLE RECORD</b>                |                      |                     |         |         |         | Revision: Final                                                                                                                                                                                   |           |      |              |
|                                                                                                                                                                                                                                   |            |                                             | North Gawber Colliery                        |                      |                     |         |         |         | Project No. 07053                                                                                                                                                                                 |           |      |              |

**APPENDIX D**  
**Cable Percussion Borehole Logs**

| Strata                                   |        |                                                                                                                                                                                                                                                                                          | Sheet 1 of 1                 |                            | Samples   |            |                                           | Tests     |              |              |
|------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|-----------|------------|-------------------------------------------|-----------|--------------|--------------|
| Depth (m)                                | Legend | Description                                                                                                                                                                                                                                                                              | Strata Depth (Thickness) (m) | Reduced Level (mAOD)       | Depth (m) | Type       | U100 Blows                                | Depth (m) | SPT          | Installation |
| 1.00                                     |        | MADE GROUND (Colliery discard consisting of medium dense and dense grey and dark grey clay bound fine to coarse gravel of angular and subangular ash, unburnt shale, burnt shale, sandstone and some brick. Occasional cobbles of sandstone present after 3.0m bgf. Damp after 3.0m bgf) | (4.20)                       |                            | 0.50-1.00 | B          |                                           | 1.00-1.45 | S = 30       |              |
| 2.00                                     |        |                                                                                                                                                                                                                                                                                          |                              |                            | 1.50-2.00 | B          |                                           |           |              |              |
| 3.00                                     |        |                                                                                                                                                                                                                                                                                          |                              |                            | 3.00-3.50 | B          |                                           | 3.00-3.45 | S = 31       |              |
| 4.00                                     |        |                                                                                                                                                                                                                                                                                          |                              |                            | 4.20-4.65 | U          | 150                                       |           |              |              |
|                                          |        | Firm grey mottled brown silty sandy CLAY. Sand is fine to coarse                                                                                                                                                                                                                         | 4.20                         | 85.00                      |           |            |                                           |           |              |              |
|                                          |        | Very weak and weak very thinly bedded light grey highly weathered MUDSTONE                                                                                                                                                                                                               | (0.40)                       | 84.60                      |           |            |                                           |           |              |              |
| 5.00                                     |        |                                                                                                                                                                                                                                                                                          | (2.00)                       |                            | 5.50-6.00 | B          |                                           | 5.50-5.91 | S = 50/255mm |              |
| 6.00                                     |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            |                                           |           |              |              |
| 7.00                                     |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            |                                           |           |              |              |
|                                          |        | End of Borehole at 6.60 m                                                                                                                                                                                                                                                                | 6.60                         | 82.60                      |           |            |                                           |           |              |              |
| 8.00                                     |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            |                                           |           |              |              |
| 9.00                                     |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            |                                           |           |              |              |
| Start Date 19/11/2007                    |        | Chiselling:                                                                                                                                                                                                                                                                              |                              | Water Strikes              |           |            | Legend                                    |           |              |              |
| End Date 19/11/2007                      |        |                                                                                                                                                                                                                                                                                          |                              | No Groundwater Encountered |           |            | D Small Disturbed Sample                  |           |              |              |
| Method Cable Percussion - Dando 3000 rig |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            | B Large Disturbed Sample                  |           |              |              |
| Drilled By J.B. Site Investigations      |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            | U Undisturbed U100 Sample                 |           |              |              |
| Logged By B. Johnson                     |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            | W Water Sample                            |           |              |              |
| Ground Level 89.2 mAOD                   |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            | S Standard Penetration Test (Split Spoon) |           |              |              |
| Coordinates 432861E - 409778N            |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            | C Standard Penetration Test (Cone)        |           |              |              |
| Remarks                                  |        |                                                                                                                                                                                                                                                                                          |                              |                            |           |            |                                           |           |              |              |
| Borehole:                                |        | BOREHOLE RECORD                                                                                                                                                                                                                                                                          |                              |                            |           | Revision   |                                           | Final     |              |              |
| BH101                                    |        | North Gawber Colliery                                                                                                                                                                                                                                                                    |                              |                            |           | Project No |                                           | 07053     |              |              |



| Strata                                                                                                                                                                                                                     |        |                                                                                                                                                                                                                                                                              | Sheet 1 of 2                 |                                              | Samples   |                   |                                                                                                                                                                                                   | Tests     |        |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-----------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|--------------|
| Depth (m)                                                                                                                                                                                                                  | Legend | Description                                                                                                                                                                                                                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                         | Depth (m) | Type              | U100 Blows                                                                                                                                                                                        | Depth (m) | SPT    | Installation |
| 1.00                                                                                                                                                                                                                       |        | MADE GROUND (Colliery discard consisting of medium dense and dense dark grey clay bound fine to coarse gravel of angular and subangular ash, mudstone, coal, unburnt shale and, in upper 2.0m, rare burnt shale. Occasional cobbles and rare boulders of sandstone present). |                              |                                              | 1.00-1.50 | B                 |                                                                                                                                                                                                   |           |        |              |
| 1.50-2.00                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                              |                              |                                              | B         |                   | 1.50-1.95                                                                                                                                                                                         | S = 26    |        |              |
| 3.00-3.50                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                              |                              |                                              | B         |                   | 3.00-3.45                                                                                                                                                                                         | S = 26    |        |              |
| 4.50-5.00                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                              |                              |                                              | B         |                   | 4.50-4.95                                                                                                                                                                                         | S = 25    |        |              |
| 6.00-6.50                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                              |                              |                                              | B         |                   | 6.00-6.45                                                                                                                                                                                         | S = 30    |        |              |
| 7.50-8.00                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                              |                              |                                              | B         |                   | 7.50-7.95                                                                                                                                                                                         | S = 38    |        |              |
| 9.00                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                                                                              | 9.10                         | 87.30                                        | 9.00-9.50 | B                 |                                                                                                                                                                                                   | 9.00-9.45 | S = 22 |              |
|                                                                                                                                                                                                                            |        | Soft and firm damp grey silty slightly gravelly CLAY. Gravel is fine subangular and subrounded coal and sandstone. Organic odour detected. Remnant roots present.                                                                                                            |                              |                                              |           |                   |                                                                                                                                                                                                   |           |        |              |
| Continued next sheet                                                                                                                                                                                                       |        |                                                                                                                                                                                                                                                                              | (1.70)                       |                                              |           |                   |                                                                                                                                                                                                   |           |        |              |
| Start Date: 16/11/2007<br>End Date: 16/11/2007<br>Method: Cable Percussion - Dando 3000 rig.<br>Drilled By: J.B. Site Investigations<br>Logged By: B. Johnson<br>Ground Level: 96.4 mAOD<br>Coordinates: 433016E - 409852N |        | Chiselling:<br>7.00m to 8.20m : 0.5 hr<br>12.60m to 13.00m : 1 hr                                                                                                                                                                                                            |                              | Water Strikes:<br>No Groundwater Encountered |           |                   | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |        |              |
| Remarks:                                                                                                                                                                                                                   |        |                                                                                                                                                                                                                                                                              |                              |                                              |           |                   |                                                                                                                                                                                                   |           |        |              |
| Borehole:                                                                                                                                                                                                                  |        | BOREHOLE RECORD                                                                                                                                                                                                                                                              |                              |                                              |           | Revision: Final   |                                                                                                                                                                                                   |           |        |              |
| BH102                                                                                                                                                                                                                      |        | North Gawber Colliery                                                                                                                                                                                                                                                        |                              |                                              |           | Project No. 07053 |                                                                                                                                                                                                   |           |        |              |



| Strata                                                                                                                                                                                                                    |        |                                                                                                                                                                   |                              | Sheet 2 of 2                                 |             | Samples           |                                                                                                                                                                                                   |             | Tests        |              |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|--------------|--|
| Depth (m)                                                                                                                                                                                                                 | Legend | Description                                                                                                                                                       | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                         | Depth (m)   | Type              | U100 Blows                                                                                                                                                                                        | Depth (m)   | SPT          | Installation |  |
| 11.00                                                                                                                                                                                                                     |        | Soft and firm damp grey silty slightly gravelly CLAY. Gravel is fine subangular and subrounded coal and sandstone. Organic odour detected. Remnant roots present. |                              |                                              | 10.00-10.45 | U                 | 63                                                                                                                                                                                                |             |              |              |  |
|                                                                                                                                                                                                                           |        |                                                                                                                                                                   |                              |                                              | 10.45-10.50 | D                 |                                                                                                                                                                                                   |             |              |              |  |
|                                                                                                                                                                                                                           |        | Very weak very thinly bedded yellowish grey MUDSTONE weathered to a firm clay.                                                                                    | 10.80                        | 85.60                                        |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 12.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   | (1.00)                       |                                              | 11.50-12.00 | B                 |                                                                                                                                                                                                   | 11.50-11.95 | S = 43       |              |  |
|                                                                                                                                                                                                                           |        | Grey weathered MUDSTONE (Driller's description).                                                                                                                  | 11.80                        | 84.60                                        |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 13.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   | (1.20)                       |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 13.00                                                                                                                                                                                                                     |        | End of Borehole at 13.00 m                                                                                                                                        | 13.00                        | 83.40                                        |             |                   |                                                                                                                                                                                                   | 13.00-13.27 | S = 45/130mm |              |  |
| 14.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   |                              |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 15.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   |                              |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 16.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   |                              |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 17.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   |                              |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 18.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   |                              |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| 19.00                                                                                                                                                                                                                     |        |                                                                                                                                                                   |                              |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| Start Date: 16/11/2007<br>End Date: 16/11/2007<br>Method: Cable Percussion - Dando 3000 rig.<br>Drilled By: J.B. Site Investigations<br>Logged By: B Johnson<br>Ground Level: 96.4 mAOD<br>Coordinates: 433016E - 409852N |        | Chiselling:<br>7.90m to 8.20m : 0.5 hr<br>12.60m to 13.00m : 1 hr                                                                                                 |                              | Water Strikes:<br>No Groundwater Encountered |             |                   | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |             |              |              |  |
| Remarks:                                                                                                                                                                                                                  |        |                                                                                                                                                                   |                              |                                              |             |                   |                                                                                                                                                                                                   |             |              |              |  |
| Borehole:                                                                                                                                                                                                                 |        | BOREHOLE RECORD                                                                                                                                                   |                              |                                              |             | Revision: Final   |                                                                                                                                                                                                   |             |              |              |  |
| BH102                                                                                                                                                                                                                     |        | North Gawber Colliery                                                                                                                                             |                              |                                              |             | Project No. 07053 |                                                                                                                                                                                                   |             |              |              |  |

| Strata                                    |        | Sheet 1 of 1                                                                                                                                                                                                                          |                              | Samples                    |           |                                           | Tests      |                                 |        |              |
|-------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|-----------|-------------------------------------------|------------|---------------------------------|--------|--------------|
| Depth (m)                                 | Legend | Description                                                                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD)       | Depth (m) | Type                                      | U100 Blows | Depth (m)                       | SPT    | Installation |
| 0.00                                      |        | MADE GROUND (Colliery discard consisting of medium dense dark grey and brown clay bound fine to coarse gravel of angular and subangular ash, unburnt shale, coal and sandstone. Wet after 1.5m bgl).                                  | (4.10)                       |                            | 0.00-1.50 | B                                         |            |                                 |        |              |
| 1.50-3.00                                 |        |                                                                                                                                                                                                                                       |                              |                            | B         | 1.50-1.95                                 |            | S = 21                          |        |              |
| 3.00-3.45                                 |        |                                                                                                                                                                                                                                       |                              |                            |           | S = 19                                    |            |                                 |        |              |
| 4.00                                      |        | MADE GROUND (Colliery discard consisting of medium dense brown and orange claybound fine to coarse gravel of subangular burnt shale, coal, mudstone and sandstone with layers of medium and coarse gravel of subangular burnt shale). | (2.90)                       | 80.80                      | 4.10-4.55 | U                                         | 66         |                                 |        |              |
| 4.55-4.70                                 |        |                                                                                                                                                                                                                                       |                              |                            | D         |                                           |            |                                 |        |              |
| 5.60-7.00                                 |        |                                                                                                                                                                                                                                       |                              |                            | B         | 5.60-6.05                                 |            | S = 11                          |        |              |
| 7.00                                      |        | Stiff friable grey mottled brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium subangular coal and sandstone. Remnant roots present.                                                                | (0.50)                       | 77.90                      | 7.00-7.10 | D                                         | 134        |                                 |        |              |
| 7.10-7.55                                 |        |                                                                                                                                                                                                                                       |                              |                            | U         |                                           |            |                                 |        |              |
| 7.50                                      |        |                                                                                                                                                                                                                                       |                              |                            |           | 77.40                                     |            |                                 |        |              |
| 8.00                                      |        | Very weak very thinly bedded grey MUDSTONE Weathered to a firm clay in pockets.                                                                                                                                                       | (1.70)                       |                            | 7.70-9.00 | B                                         |            | 7.70-8.15                       | S = 42 |              |
| 9.00                                      |        |                                                                                                                                                                                                                                       |                              |                            |           | 9.00-9.25                                 |            | S = 50/95mm                     |        |              |
| End of Borehole at 9.20 m                 |        |                                                                                                                                                                                                                                       |                              |                            | 9.20      | 75.70                                     |            |                                 |        |              |
| Start Date: 15/1/2007                     |        | Chiselling:                                                                                                                                                                                                                           |                              | Water Strikes:             |           | Legend:                                   |            |                                 |        |              |
| End Date: 16/1/2007                       |        | 4.00m to 4.50m: 0.5 hr                                                                                                                                                                                                                |                              | No Groundwater Encountered |           | D Small Disturbed Sample                  |            |                                 |        |              |
| Method: Cable Percussion - Dando 3000 rig |        | 5.10m to 5.25m: 0.75 hr                                                                                                                                                                                                               |                              |                            |           | B Large Disturbed Sample                  |            |                                 |        |              |
| Drilled By: J.B. Site Investigations      |        | 9.00m to 9.20m: 0.5 hr                                                                                                                                                                                                                |                              |                            |           | U Undisturbed U100 Sample                 |            |                                 |        |              |
| Logged By: B Johnson                      |        |                                                                                                                                                                                                                                       |                              |                            |           | W Water Sample                            |            |                                 |        |              |
| Ground Level: 84.9 mAOD                   |        |                                                                                                                                                                                                                                       |                              |                            |           | S Standard Penetration Test (Split Spoon) |            |                                 |        |              |
| Coordinates: 432993E - 409691N            |        |                                                                                                                                                                                                                                       |                              |                            |           | C Standard Penetration Test (Cone)        |            |                                 |        |              |
| Remarks:                                  |        |                                                                                                                                                                                                                                       |                              |                            |           |                                           |            |                                 |        |              |
| Borehole:                                 |        | BOREHOLE RECORD                                                                                                                                                                                                                       |                              |                            |           | Revision: Final                           |            | <br>SCOTT DOHERTY<br>ASSOCIATES |        |              |
| BH103                                     |        | North Gawber Colliery                                                                                                                                                                                                                 |                              |                            |           | Project No. 07053                         |            |                                 |        |              |

| Strata                                   |        |                                                                                                                                                                                                                                                           | Sheet 1 of 1                 |                                              | Samples   |                                          |                                                                                                                                                                                                   | Tests                        |           |              |
|------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-----------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------|--------------|
| Depth (m)                                | Legend | Description                                                                                                                                                                                                                                               | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                         | Depth (m) | Type                                     | U100 Blows                                                                                                                                                                                        | Depth (m)                    | SPT       | Installation |
| 1.00                                     |        | MADE GROUND (Colliery discard consisting of medium dense and dense dark grey and grey clay bound fine to coarse gravel of angular and subangular est., mudstone and coal. Becomes friable after 1.5m bgl. Remnant roots present between 1.5 and 2.0m bgl. | (5.90)                       |                                              | 1.00-1.50 | B                                        | 150                                                                                                                                                                                               |                              |           |              |
| 1.50-2.00                                |        |                                                                                                                                                                                                                                                           |                              |                                              | B         | 1.50-1.95                                |                                                                                                                                                                                                   | S = 20                       |           |              |
| 3.00-3.50                                |        |                                                                                                                                                                                                                                                           |                              |                                              | B         | 3.00-3.45                                |                                                                                                                                                                                                   | S = 36                       |           |              |
| 4.50-4.95                                |        |                                                                                                                                                                                                                                                           |                              |                                              |           | S = 25                                   |                                                                                                                                                                                                   |                              |           |              |
| 5.90-6.30                                |        |                                                                                                                                                                                                                                                           |                              |                                              | U         |                                          |                                                                                                                                                                                                   |                              |           |              |
| 6.00                                     |        | Soft grey mottled brown silty slightly gravelly CLAY<br>Gravel is fine angular coal.                                                                                                                                                                      | 5.90<br>(0.40)               | 85.00<br>84.60                               | 5.90-6.30 | U                                        |                                                                                                                                                                                                   |                              |           |              |
|                                          |        | Very weak and weak very thinly bedded yellowish brown SANDSTONE weathered to a firm clay in pockets                                                                                                                                                       | 6.30<br>(0.70)               | 84.60<br>83.90                               | 6.30-6.40 | D                                        |                                                                                                                                                                                                   |                              |           |              |
| 7.00                                     |        | End of Borehole at 7.00 m                                                                                                                                                                                                                                 | 7.00                         | 83.90                                        |           |                                          |                                                                                                                                                                                                   | 7.00-7.08                    | S = 0/0mm |              |
| 8.00                                     |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| 9.00                                     |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Start Date 16/11/2007                    |        | Chiselling:<br>3.40m to 3.80m 0.5 hr<br>5.70m to 7.00m 1 hr                                                                                                                                                                                               |                              | Water Strikes:<br>No Groundwater Encountered |           |                                          | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |                              |           |              |
| End Date 16/11/2007                      |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Method Cable Percussion - Dando 3000 rig |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Drilled By J B Site Investigations       |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Logged By B Johnson                      |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Ground Level 90.9 mAOD                   |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Coordinates 433006E - 409807N            |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Remarks                                  |        |                                                                                                                                                                                                                                                           |                              |                                              |           |                                          |                                                                                                                                                                                                   |                              |           |              |
| Borehole:<br><br>BH104                   |        | BOREHOLE RECORD<br><br>North Gawber Colliery                                                                                                                                                                                                              |                              |                                              |           | Revision: Final<br><br>Project No. 07053 |                                                                                                                                                                                                   | <br>SCOTT DOHERTY ASSOCIATES |           |              |

| Strata                                                                                                                                                                                                             |        | Sheet 1 of 1                                                                                                                                                                                                                                                                   |                              | Samples                                     |                           |                  | Tests                                                                                                                                                                                            |                              |             |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------|---------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------|--------------|
| Depth (m)                                                                                                                                                                                                          | Legend | Description                                                                                                                                                                                                                                                                    | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                        | Depth (m)                 | Type             | U100 Blows                                                                                                                                                                                       | Depth (m)                    | SPT         | Installation |
| 0.00                                                                                                                                                                                                               |        | MADE GROUND (Colliery discard consisting of medium dense dark grey clay bound fine to coarse gravel of angular and subangular ash, coal, unburnt shale and burnt shale. Damp after 1.0m bgl)                                                                                   | (2.50)                       | 84.30                                       | 0.50-1.00                 | B                |                                                                                                                                                                                                  |                              |             |              |
| 1.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             | 1.00-1.50                 | B                |                                                                                                                                                                                                  | 1.00-1.45                    | S = 28      |              |
| 2.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             |                           |                  |                                                                                                                                                                                                  |                              |             |              |
| 2.50                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             | 2.50-3.00                 | B                |                                                                                                                                                                                                  | 2.50-2.95                    | S = 17      |              |
| 3.00                                                                                                                                                                                                               |        | MADE GROUND (Colliery discard consisting of medium dense damp grey slightly silty sandy fine to coarse gravel of angular to subrounded ash, burnt shale, unburnt shale, burnt sandstone and coal. Some cobbles of sandstone present also. Becomes very clayey after 5.5m bgl). | (4.40)                       | 79.90                                       | 4.00-4.50                 | B                |                                                                                                                                                                                                  |                              |             |              |
| 4.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             |                           |                  |                                                                                                                                                                                                  |                              |             |              |
| 5.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             |                           |                  |                                                                                                                                                                                                  | 4.95-5.40                    | S = 15      |              |
| 5.50                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             | 5.50-6.00                 | B                |                                                                                                                                                                                                  | 5.50-5.95                    | S = 13      |              |
| 6.00                                                                                                                                                                                                               |        | Very weak and weak very thinly bedded yellowish brown SANDSTONE weathered to a stiff clay                                                                                                                                                                                      | (1.20)                       | 78.70                                       | 7.00-7.50                 | B                |                                                                                                                                                                                                  |                              |             |              |
| 7.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             |                           |                  |                                                                                                                                                                                                  | 7.00-7.45                    | S = 40      |              |
| 8.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             |                           |                  |                                                                                                                                                                                                  | 8.10-8.22                    | S = 19/25mm |              |
| 8.10                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             | End of Borehole at 8.10 m |                  |                                                                                                                                                                                                  |                              |             |              |
| 9.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                |                              |                                             |                           |                  |                                                                                                                                                                                                  |                              |             |              |
| Start Date 20/11/2007<br>End Date 20/11/2007<br>Method Cable Percussion - Dando 3000 rig<br>Drilled By J.B. Site Investigations<br>Logged By B. Johnson<br>Ground Level 85.8 mAOD<br>Coordinates 433094E - 409684N |        | Chiselling:<br>7.80m to 8.10m 1 hr                                                                                                                                                                                                                                             |                              | Water Strikes<br>No Groundwater Encountered |                           |                  | Legend<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |                              |             |              |
| Remarks                                                                                                                                                                                                            |        |                                                                                                                                                                                                                                                                                |                              |                                             |                           |                  |                                                                                                                                                                                                  |                              |             |              |
| Borehole:                                                                                                                                                                                                          |        | BOREHOLE RECORD                                                                                                                                                                                                                                                                |                              |                                             |                           | Revision: Final  |                                                                                                                                                                                                  | <br>SCOTT DOHERTY ASSOCIATES |             |              |
| BH105                                                                                                                                                                                                              |        | North Gawber Colliery                                                                                                                                                                                                                                                          |                              |                                             |                           | Project No 07053 |                                                                                                                                                                                                  |                              |             |              |

| Strata                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                               | Sheet 1 of 1                 |                                              | Samples   |      |                                                                                                                                                                                                   | Tests     |        |                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-----------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|--------------------------------|
| Depth (m)                                                                                                                                                                                                               | Legend | Description                                                                                                                                                                                                                                                   | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                         | Depth (m) | Type | U100 Blows                                                                                                                                                                                        | Depth (m) | SPT    | Installation                   |
| 0.00                                                                                                                                                                                                                    |        | MADE GROUND (Colliery discard consisting of dense and medium dense damp dark grey clay bound fine to coarse gravel of angular and subangular ash, coal, mudstone and unburnt shale. Some cobbles of burnt shale, brick and limestone present after 3.0m bgl). | (7.40)                       |                                              | 0.00-1.50 | B    |                                                                                                                                                                                                   |           |        |                                |
| 1.50-3.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                               |                              |                                              | B         |      | 1.50-1.95                                                                                                                                                                                         | S = 49    |        |                                |
| 3.00-4.50                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                               |                              |                                              | B         |      | 3.00-3.45                                                                                                                                                                                         | S = 15    |        |                                |
| 4.50-6.00                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                               |                              |                                              | B         |      | 4.50-4.95                                                                                                                                                                                         | S = 19    |        |                                |
| 6.00-7.40                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                               |                              |                                              | B         |      | 6.00-6.45                                                                                                                                                                                         | S = 17    |        |                                |
| 7.40                                                                                                                                                                                                                    |        | Weathered yellow SANDSTONE (driller's description)                                                                                                                                                                                                            | 7.40                         | 76.10                                        |           |      |                                                                                                                                                                                                   | 7.40-7.85 | S = 65 |                                |
| 8.00                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                               | (0.70)                       |                                              |           |      |                                                                                                                                                                                                   |           |        |                                |
| 8.10                                                                                                                                                                                                                    |        | End of Borehole at 8.10 m                                                                                                                                                                                                                                     | 8.10                         | 75.40                                        |           |      |                                                                                                                                                                                                   |           |        |                                |
| 9.00                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                               |                              |                                              |           |      |                                                                                                                                                                                                   |           |        |                                |
| Start Date: 20/11/2007<br>End Date: 20/11/2007<br>Method: Cable Percussion - Dando 3000 ng<br>Drilled By: J.B. Site Investigations<br>Logged By: B Johnson<br>Ground Level: 83.5 mAOD<br>Coordinates: 433154E - 409658N |        | Chiselling:<br>0.70m to 1.00m : 1.25 hr<br>6.00m to 8.10m : 0.5 hr                                                                                                                                                                                            |                              | Water Strikes:<br>No Groundwater Encountered |           |      | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Spill Spoon)<br>C Standard Penetration Test (Cone) |           |        |                                |
| Remarks:                                                                                                                                                                                                                |        |                                                                                                                                                                                                                                                               |                              |                                              |           |      |                                                                                                                                                                                                   |           |        | <br>SCOTT DOHERTY & ASSOCIATES |
| Borehole:                                                                                                                                                                                                               |        | BOREHOLE RECORD                                                                                                                                                                                                                                               |                              |                                              |           |      | Revision: Final                                                                                                                                                                                   |           |        |                                |
| BH106                                                                                                                                                                                                                   |        | North Gawber Colliery                                                                                                                                                                                                                                         |                              |                                              |           |      | Project No. 07053                                                                                                                                                                                 |           |        |                                |

| Strata                                                                  |        |                                                                            |                              | Sheet 1 of 1                              |           | Samples         |                                           |                   | Tests |              |  |
|-------------------------------------------------------------------------|--------|----------------------------------------------------------------------------|------------------------------|-------------------------------------------|-----------|-----------------|-------------------------------------------|-------------------|-------|--------------|--|
| Depth (m)                                                               | Legend | Description                                                                | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                      | Depth (m) | Type            | U100 Blows                                | Depth (m)         | SPT   | Installation |  |
|                                                                         |        | MADE GROUND (Medium dense grey colliery discard. (Driller's description)). | (0.50)                       |                                           |           |                 |                                           |                   |       |              |  |
|                                                                         |        | MADE GROUND (Concrete).                                                    | 0.50                         | 90.10                                     |           |                 |                                           |                   |       |              |  |
|                                                                         |        | End of Borehole at 0.60 m                                                  | 0.60                         | 90.00                                     |           |                 |                                           |                   |       |              |  |
| -1.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -2.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -3.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -4.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -5.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -6.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -7.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -8.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| -9.00                                                                   |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| Start Date: 19/11/2007                                                  |        | Chiselling: 0.50m to 0.60m : 1 hr                                          |                              | Water Strikes: No Groundwater Encountered |           |                 | Legend:                                   |                   |       |              |  |
| End Date: 19/11/2007                                                    |        |                                                                            |                              |                                           |           |                 | D Small Disturbed Sample                  |                   |       |              |  |
| Method: Cable Percussion - Dando 3000 rig.                              |        |                                                                            |                              |                                           |           |                 | B Large Disturbed Sample                  |                   |       |              |  |
| Drilled By: J.B. Site Investigations                                    |        |                                                                            |                              |                                           |           |                 | U Undisturbed U100 Sample                 |                   |       |              |  |
| Logged By:                                                              |        |                                                                            |                              |                                           |           |                 | W Water Sample                            |                   |       |              |  |
| Ground Level: 90.6 mAOD                                                 |        |                                                                            |                              |                                           |           |                 | S Standard Penetration Test (Split Spoon) |                   |       |              |  |
| Coordinates: 433152E - 409754N                                          |        |                                                                            |                              |                                           |           |                 | C Standard Penetration Test (Cone)        |                   |       |              |  |
| Remarks:<br>Borehole terminated at 0.6m bgl upon encountering concrete. |        |                                                                            |                              |                                           |           |                 |                                           |                   |       |              |  |
| Borehole:<br><br>BH107                                                  |        | BOREHOLE RECORD<br><br>North Gawber Colliery                               |                              |                                           |           | Revision: Final |                                           | Project No. 07053 |       |              |  |



| Strata    |        |                                                                                                                                                                                                                                                                           | Sheet 1 of 1                 |                      | Samples   |      |            | Tests     |              |              |  |
|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|------------|-----------|--------------|--------------|--|
| Depth (m) | Legend | Description                                                                                                                                                                                                                                                               | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | U100 Blows | Depth (m) | SPT          | Installation |  |
|           |        | MADE GROUND (Medium dense grey colliery discard (Driller's description))                                                                                                                                                                                                  | (0.50)                       |                      |           |      |            |           |              |              |  |
|           |        |                                                                                                                                                                                                                                                                           | 0.50                         | 90.10                | 0.50-1.00 | B    |            |           |              |              |  |
| 1.00      |        | MADE GROUND (Colliery discard consisting of dense grey and brown clay bound fine to coarse gravel of angular and subangular mudstone, ash, coal, unburnt shale and burnt shale. Many cobbles of burnt shale present after 1m bgl. Pockets of clay present after 2.5m bgl) | (4.60)                       |                      | 1.00-1.50 | B    |            | 1.00-1.31 | S = 45/157mm |              |  |
| 2.00      |        |                                                                                                                                                                                                                                                                           |                              |                      |           |      |            |           |              |              |  |
| 3.00      |        |                                                                                                                                                                                                                                                                           |                              |                      |           |      |            |           |              |              |  |
| 4.00      |        |                                                                                                                                                                                                                                                                           |                              |                      |           |      |            |           |              |              |  |
| 5.00      |        |                                                                                                                                                                                                                                                                           | 5.10                         | 85.50                |           |      |            |           |              |              |  |
|           |        | Weak very thinly bedded yellow and brown coarse grained weathered SANDSTONE.                                                                                                                                                                                              | (0.90)                       |                      | 5.20-5.70 | B    |            | 5.20-5.57 | S = 52/215mm |              |  |
| 6.00      |        |                                                                                                                                                                                                                                                                           | 6.00                         | 84.60                |           |      |            |           |              |              |  |
|           |        | End of Borehole at 6.00 m                                                                                                                                                                                                                                                 |                              |                      |           |      |            | 6.00-6.18 | S = 50/85mm  |              |  |
| 7.00      |        |                                                                                                                                                                                                                                                                           |                              |                      |           |      |            |           |              |              |  |
| 8.00      |        |                                                                                                                                                                                                                                                                           |                              |                      |           |      |            |           |              |              |  |
| 9.00      |        |                                                                                                                                                                                                                                                                           |                              |                      |           |      |            |           |              |              |  |

Start Date: 19/11/2007  
 End Date: 19/11/2007  
 Method: Cable Percussion - Dando 3000 rig.  
 Drilled By: J.B. Site Investigations  
 Logged By: B Johnson  
 Ground Level: 90.6 mAOD  
 Coordinates: 433152E - 409754N

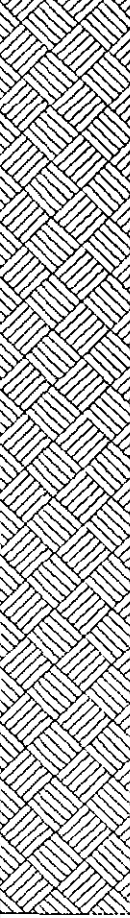
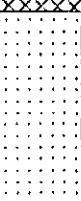
Chiselling:  
 0.70m to 0.90m : 0.75 hr  
 1.70m to 2.00m : 0.5 hr  
 5.60m to 6.00m : 0.75 hr

Water Strikes:  
 No Groundwater Encountered

Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks:

|           |                       |                   |                                                                                                                   |
|-----------|-----------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|
| Borehole: | BOREHOLE RECORD       | Revision: Final   | <br>SCOTT DOHERTY ASSOCIATES |
| BH107A    |                       | Project No. 07053 |                                                                                                                   |
|           | North Gawber Colliery |                   |                                                                                                                   |

| Strata    |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                | Sheet 1 of 1                 |                      | Samples   |      |            | Tests     |        |                                                                                       |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|------------|-----------|--------|---------------------------------------------------------------------------------------|
| Depth (m) | Legend                                                                            | Description                                                                                                                                                                                                                                                                                                                                                                                    | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | U100 Blows | Depth (m) | SPT    | Installation                                                                          |
| 1.00      |  | MADE GROUND (Colliery discard consisting of medium dense dark grey clay bound fine to coarse gravel of angular and subangular mudstone, coal, unburnt shale and rare burnt shale. Occasional cobbles of sandstone present also. Pockets of firm clay present after 1.5m bgl. Friable after 3.0m bgl and recovered as a coarse angular gravel. Remnant roots present between 3.0m and 3.5m bgl. | (4.20)                       |                      | 0.50-1.00 | B    |            |           |        |   |
| 2.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |                              |                      | 1.50-2.00 | B    |            | 1.50-1.95 | S = 26 |                                                                                       |
| 3.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |                              |                      | 3.00-3.50 | B    |            | 3.00-3.45 | S = 27 |                                                                                       |
| 4.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |                              |                      | 4.20-4.70 | B    |            | 4.20-4.65 | S = 42 |                                                                                       |
| 5.00      |  | Weak very thinly bedded grey weathered orange medium grained SANDSTONE.                                                                                                                                                                                                                                                                                                                        | (1.30)                       |                      |           |      |            |           |        |  |
| 6.00      |                                                                                   | End of Borehole at 6.00 m                                                                                                                                                                                                                                                                                                                                                                      |                              |                      |           |      |            |           |        |                                                                                       |
| 7.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |                              |                      |           |      |            |           |        |                                                                                       |
| 8.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |                              |                      |           |      |            |           |        |                                                                                       |
| 9.00      |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |                              |                      |           |      |            |           |        |                                                                                       |

Start Date: 19/11/2007  
 End Date: 19/11/2007  
 Method: Cable Percussion - Dando 3000 rig.  
 Drilled By: J.B. Site Investigations  
 Logged By: B Johnson  
 Ground Level: 92.7 mAOD  
 Coordinates: 433126E - 409821N

Chiselling:  
 5.20m to 5.60m : 0.75 hr

Water Strikes:  
 No Groundwater Encountered

Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks:

Borehole:  
 BH108

## BOREHOLE RECORD

North Gawber Colliery

Revision: Final

Project No. 07053





| Strata                                                                                                                                                                                                             |        |                                                                                                                                                                    | Sheet 1 of 1                 |                                             | Samples                   |                                                                                                                                                                                                  | Tests      |                              |        |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------|--------|--------------|
| Depth (m)                                                                                                                                                                                                          | Legend | Description                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                        | Depth (m)                 | Type                                                                                                                                                                                             | U100 Blows | Depth (m)                    | SPT    | Installation |
| 0.00                                                                                                                                                                                                               |        | MADE GROUND (Colliery discard consisting of medium dense wet dark grey clay bound fine to coarse gravel of angular to subrounded mudstone sandstone and rare coal) | (2.10)                       |                                             | 0.50-1.00                 | B                                                                                                                                                                                                |            |                              |        |              |
| 1.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             | 1.00-1.50                 | B                                                                                                                                                                                                | 1.00-1.45  | S = 16                       |        |              |
| 2.00                                                                                                                                                                                                               |        | Moderately weak very thinly bedded yellowish brown highly weathered medium grained SANDSTONE with very thin bands of coal                                          | (1.90)                       | 85.50                                       | 2.20-2.70                 | B                                                                                                                                                                                                |            | 2.20-2.65                    | S = 34 |              |
| 3.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             | 3.50-4.00                 | B                                                                                                                                                                                                | 3.50-3.89  | S = 51/235mm                 |        |              |
| 4.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             | End of Borehole at 4.00 m |                                                                                                                                                                                                  | 4.00       | 83.60                        |        |              |
| 5.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             |                           |                                                                                                                                                                                                  |            |                              |        |              |
| 6.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             |                           |                                                                                                                                                                                                  |            |                              |        |              |
| 7.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             |                           |                                                                                                                                                                                                  |            |                              |        |              |
| 8.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             |                           |                                                                                                                                                                                                  |            |                              |        |              |
| 9.00                                                                                                                                                                                                               |        |                                                                                                                                                                    |                              |                                             |                           |                                                                                                                                                                                                  |            |                              |        |              |
| Start Date 20/11/2007<br>End Date 20/11/2007<br>Method Cable Percussion - Dando 3000 rig<br>Drilled By J.B. Site Investigations<br>Logged By B. Johnson<br>Ground Level 87.6 mAOD<br>Coordinates 433256E - 409707N |        | Chiselling<br>3.60m to 4.00m 1 hr                                                                                                                                  |                              | Water Strikes<br>No Groundwater Encountered |                           | Legend<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |            |                              |        |              |
| Remarks                                                                                                                                                                                                            |        |                                                                                                                                                                    |                              |                                             |                           |                                                                                                                                                                                                  |            |                              |        |              |
| Borehole: BH109                                                                                                                                                                                                    |        | BOREHOLE RECORD                                                                                                                                                    |                              |                                             |                           | Revision: Final                                                                                                                                                                                  |            | <br>SCOTT DOHERTY ASSOCIATES |        |              |
|                                                                                                                                                                                                                    |        | North Gawber Colliery                                                                                                                                              |                              |                                             |                           | Project No. 07053                                                                                                                                                                                |            |                              |        |              |

| Strata                                    |                           |                                                                                                                                                                                                                              | Sheet 1 of 1                 |                                           | Samples   |                   |                                                                                                                                                                                                   | Tests     |              |              |  |
|-------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------|-----------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|--------------|--|
| Depth (m)                                 | Legend                    | Description                                                                                                                                                                                                                  | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                      | Depth (m) | Type              | U100 Blows                                                                                                                                                                                        | Depth (m) | SPT          | Installation |  |
| 1.00                                      |                           | MADE GROUND (Colliery discard consisting of medium dense grey clay bound fine to coarse gravel of angular and subangular coal, unburnt shale and occasional burnt shale).                                                    | (1.80)                       |                                           | 0.00-1.50 | B                 |                                                                                                                                                                                                   |           |              |              |  |
|                                           |                           |                                                                                                                                                                                                                              |                              |                                           | 1.50-1.80 | B                 |                                                                                                                                                                                                   |           |              |              |  |
| 2.00                                      |                           | MADE GROUND (Colliery discard consisting of medium dense grey and brown clayey to very clayey fine to coarse sandy gravel of angular and subangular ash, mudstone, coal and burnt shale. Some pockets of firm clay present). | 1.80                         |                                           | 1.80-3.20 | B                 |                                                                                                                                                                                                   | 1.80-2.25 | S = 27       |              |  |
|                                           |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| 3.00                                      |                           |                                                                                                                                                                                                                              | (2.35)                       |                                           |           |                   |                                                                                                                                                                                                   | 3.20-3.65 | S = 17       |              |  |
|                                           |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| 4.00                                      |                           |                                                                                                                                                                                                                              | 4.15                         |                                           | 4.15      | B                 | 180                                                                                                                                                                                               |           |              |              |  |
|                                           |                           |                                                                                                                                                                                                                              |                              |                                           |           | 4.20              |                                                                                                                                                                                                   | B         |              |              |  |
|                                           |                           | MADE GROUND (Stiff grey gravelly clay. Gravel is fine to coarse angular coal. Organic odour detected. Remnant roots present).                                                                                                | (0.70)                       |                                           | 4.20-4.30 | D                 |                                                                                                                                                                                                   |           |              |              |  |
|                                           |                           | Stiff grey mottled brown slightly gravelly CLAY. Gravel is fine to coarse subangular sandstone and coal.                                                                                                                     | 4.80                         |                                           | 4.30-4.75 | U                 |                                                                                                                                                                                                   |           |              |              |  |
| 5.00                                      |                           | Very weak very thinly bedded grey highly weathered MUDSTONE                                                                                                                                                                  | (1.75)                       |                                           | 4.75-4.90 | D                 |                                                                                                                                                                                                   | 4.90-5.20 | S = 45/150mm |              |  |
|                                           |                           |                                                                                                                                                                                                                              |                              |                                           |           | 4.90-6.40         | B                                                                                                                                                                                                 |           |              |              |  |
| 6.00                                      |                           |                                                                                                                                                                                                                              | 6.65                         |                                           | 6.40-6.65 | D                 |                                                                                                                                                                                                   | 6.40-6.66 | S = 50/110mm |              |  |
|                                           |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| 7.00                                      | End of Borehole at 6.65 m |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| 8.00                                      |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| 9.00                                      |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Start Date: 15/11/2007                    |                           | Chiselling: 6.40m to 6.65m : 0.5 hr                                                                                                                                                                                          |                              | Water Strikes: No Groundwater Encountered |           |                   | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |              |              |  |
| End Date: 15/11/2007                      |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Method: Cable Percussion - Dando 3000 rig |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Drilled By: J.B. Site investigations      |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Logged By: B Johnson                      |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Ground Level: -                           |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Coordinates: 432904E - 409629N            |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Remarks:                                  |                           |                                                                                                                                                                                                                              |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |              |  |
| Borehole: BH110                           |                           | BOREHOLE RECORD                                                                                                                                                                                                              |                              |                                           |           | Revision: Final   |                                                                                                                                                                                                   |           |              |              |  |
|                                           |                           | North Gawber Colliery                                                                                                                                                                                                        |                              |                                           |           | Project No. 07053 |                                                                                                                                                                                                   |           |              |              |  |

| Strata                                     |                           |                                                                                                                                                                               |                              | Sheet 1 of 1                              |           | Samples           |                                                                                                                                                                                                   |           | Tests        |                                        |  |
|--------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------|-----------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|--|
| Depth (m)                                  | Legend                    | Description                                                                                                                                                                   | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                      | Depth (m) | Type              | U100 Blows                                                                                                                                                                                        | Depth (m) | SPT          | Installation                           |  |
| 0.00                                       |                           | MADE GROUND (Colliery discard consisting of medium dense red, brown and grey clay bound fine to coarse gravel of angular and subangular ash, burnt shale, mudstone and coal). | (1.50)                       |                                           | 0.00-1.50 | B                 |                                                                                                                                                                                                   |           |              |                                        |  |
| 1.50                                       |                           |                                                                                                                                                                               | 77.20                        | 1.50-3.00                                 | B         |                   | 1.50-1.95                                                                                                                                                                                         | S = 13    |              |                                        |  |
| 2.00                                       |                           | MADE GROUND (Colliery discard consisting of medium dense damp grey clayey fine to coarse gravel of subangular mudstone and burnt shale with pockets of clay).                 | (1.90)                       |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| 3.00                                       |                           |                                                                                                                                                                               |                              | 3.00-3.45                                 |           | S = 11            |                                                                                                                                                                                                   |           |              |                                        |  |
| 3.40                                       |                           | MADE GROUND (Colliery discard consisting of stiff grey gravelly clay. Gravel is fine to coarse subangular mudstone, sandstone and coal with occasional cobbles of sandstone). | (0.60)                       |                                           | 3.40-4.00 | B                 |                                                                                                                                                                                                   |           |              |                                        |  |
| 4.00                                       |                           |                                                                                                                                                                               | 74.70                        | 4.00-4.45                                 | U         | 70                |                                                                                                                                                                                                   |           |              |                                        |  |
| 4.00                                       |                           | Stiff grey mottled brown gravelly CLAY. Gravel is fine and medium angular and subangular mudstone and coal.                                                                   | (0.80)                       |                                           | 4.45-4.60 | D                 |                                                                                                                                                                                                   |           |              |                                        |  |
| 4.80                                       |                           |                                                                                                                                                                               | 73.90                        | 4.80-5.25                                 | B         |                   | S = 35                                                                                                                                                                                            |           |              |                                        |  |
| 5.00                                       |                           | Weak very thinly bedded grey highly weathered MUDSTONE                                                                                                                        | (1.80)                       |                                           | 6.30-6.60 | D                 |                                                                                                                                                                                                   | 6.30-6.56 | S = 77/105mm |                                        |  |
| 6.00                                       |                           |                                                                                                                                                                               |                              | 6.60                                      | 72.10     |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| 6.60                                       | End of Borehole at 6.60 m |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| 7.00                                       |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| 8.00                                       |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| 9.00                                       |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| Start Date: 16/11/2007                     |                           | Chiselling: 6.30m to 6.60m - 0.5 hr                                                                                                                                           |                              | Water Strikes: No Groundwater Encountered |           |                   | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |              |                                        |  |
| End Date: 16/11/2007                       |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| Method: Cable Percussion - Dando 3000 rig. |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| Drilled By: J.B. Sile Investigations       |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| Logged By: B Johnson                       |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| Ground Level: 78.7 mAOD                    |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| Coordinates: 433024E - 409629N             |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              |                                        |  |
| Remarks:                                   |                           |                                                                                                                                                                               |                              |                                           |           |                   |                                                                                                                                                                                                   |           |              | <br><b>SCOTT DOHERTY</b><br>ASSOCIATES |  |
| Borehole:                                  |                           | BOREHOLE RECORD                                                                                                                                                               |                              |                                           |           | Revision: Final   |                                                                                                                                                                                                   |           |              |                                        |  |
| BH111                                      |                           | North Gawber Colliery                                                                                                                                                         |                              |                                           |           | Project No. 07053 |                                                                                                                                                                                                   |           |              |                                        |  |

| Strata    |        |                                                                                                                    | Sheet 1 of 1                 |                      | Samples                |        |            | Tests     |           |              |
|-----------|--------|--------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|------------------------|--------|------------|-----------|-----------|--------------|
| Depth (m) | Legend | Description                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m)              | Type   | U100 Blows | Depth (m) | SPT       | Installation |
|           |        | MADE GROUND (Colliery discard consisting of firm grey gravelly clay. Gravel is fine to coarse subangular mudstone) | (0.25)                       | 74.35                | 0.00-0.25              | B      |            |           |           |              |
|           |        | MADE GROUND (Very soft wet dark grey gravelly silt. Gravel is fine angular coal. Strong organic odour detected)    |                              |                      | 0.25-1.50              | B      |            |           |           |              |
| -1.00     |        |                                                                                                                    |                              |                      |                        |        |            |           |           |              |
|           |        |                                                                                                                    | (2.85)                       |                      |                        |        |            | 1.50-1.85 | S = 0     |              |
| -2.00     |        |                                                                                                                    |                              |                      |                        |        |            |           |           |              |
| -3.00     |        |                                                                                                                    | 3.10                         | 71.55                | 3.10-3.20<br>3.20-3.65 | D<br>U | 84         |           |           |              |
|           |        | Firm grey and brown mottled orange gravelly CLAY. Gravel is fine angular and subangular coal and mudstone          |                              |                      | 3.65-3.80              | D      |            |           |           |              |
| -4.00     |        |                                                                                                                    | (1.65)                       |                      |                        |        |            |           |           |              |
|           |        |                                                                                                                    | 4.75                         | 69.85                | 4.75-5.80              | B      |            | 4.75-5.20 | S = 89    |              |
| -5.00     |        | Weak very finely bedded grey highly weathered MUDSTONE with very thin bands of medium grained SANDSTONE.           | (1.05)                       |                      |                        |        |            |           |           |              |
|           |        |                                                                                                                    | 5.80                         | 68.80                |                        |        |            | 5.80-5.87 | S = 0/0mm |              |
| -6.00     |        | End of Borehole at 5.80 m                                                                                          |                              |                      |                        |        |            |           |           |              |
| -7.00     |        |                                                                                                                    |                              |                      |                        |        |            |           |           |              |
| -8.00     |        |                                                                                                                    |                              |                      |                        |        |            |           |           |              |
| -9.00     |        |                                                                                                                    |                              |                      |                        |        |            |           |           |              |

Start Date 15/11/2007  
 End Date 15/11/2007  
 Method Cabin Percussion - Dando 3000 rtp  
 Drilled By J.B. Site Investigations  
 Logged By B. Johnson  
 Ground Level 74.6 mAOD  
 Coordinates 433015E - 409562N

Chiselling:

Water Strikes  
 No Groundwater Encountered

Legend  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks

|          |                       |  |            |       |
|----------|-----------------------|--|------------|-------|
| Borehole | BOREHOLE RECORD       |  | Revision   | Final |
| BH112    | North Gawber Colliery |  | Project No | 07053 |



| Strata    |        | Sheet 1 of 1                                                                                                                                                                                                          |                              |                      | Samples   |      |            | Tests     |              |              |
|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|------------|-----------|--------------|--------------|
| Depth (m) | Legend | Description                                                                                                                                                                                                           | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | U100 Blows | Depth (m) | SPT          | Installation |
| 0.00      |        | MADE GROUND (Colliery discard consisting of very loose to medium dense wet grey and brown clay bound fine to coarse gravel of angular and subangular ash, burnt shale and mudstone with some cobbles of burnt shale). |                              |                      | 0.00-1.50 | B    |            |           |              |              |
| 1.00      |        |                                                                                                                                                                                                                       |                              |                      |           |      |            |           |              |              |
| 2.00      |        |                                                                                                                                                                                                                       | (3.25)                       |                      | 1.50-3.00 | B    |            | 1.50-1.95 | S = 1        |              |
| 3.00      |        |                                                                                                                                                                                                                       |                              |                      |           |      |            | 3.00-3.45 | S = 11       |              |
| 4.00      |        | Firm and stiff grey mottled yellow CLAY (driller's description)                                                                                                                                                       | 3.25                         | 71.45                |           |      |            |           |              |              |
|           |        | Very weathered grey MUDSTONE (driller's description)                                                                                                                                                                  | 3.40                         | 71.30                |           |      |            |           |              |              |
| 5.00      |        |                                                                                                                                                                                                                       | (2.10)                       |                      |           |      |            | 3.80-4.25 | S = 44       |              |
| 6.00      |        |                                                                                                                                                                                                                       |                              |                      |           |      |            | 5.30-5.62 | S = 69/165mm |              |
| 7.00      |        | End of Borehole at 5.50 m                                                                                                                                                                                             | 5.50                         | 69.20                |           |      |            |           |              |              |
| 8.00      |        |                                                                                                                                                                                                                       |                              |                      |           |      |            |           |              |              |
| 9.00      |        |                                                                                                                                                                                                                       |                              |                      |           |      |            |           |              |              |

Start Date: 19/11/2007  
 End Date: 19/11/2007  
 Method: Cable Percussion - Dando 3000 rig  
 Drilled By: J.B. Site Investigations  
 Logged By: B Johnson  
 Ground Level: 74.7 mAOD  
 Coordinates: 433086E - 409559N

Chiselling:  
 5.30m to 5.50m : 0.5 hr

Water Strikes:  
 No Groundwater Encountered

Legend:  
 D Small Disturbed Sample  
 B Large Disturbed Sample  
 U Undisturbed U100 Sample  
 W Water Sample  
 S Standard Penetration Test (Split Spoon)  
 C Standard Penetration Test (Cone)

Remarks:

|           |                       |                   |                                                                                       |
|-----------|-----------------------|-------------------|---------------------------------------------------------------------------------------|
| Borehole: | BOREHOLE RECORD       | Revision: Final   |  |
| BH113     |                       | Project No. 07053 |                                                                                       |
|           | North Gawber Colliery |                   |                                                                                       |

| Strata    |                           |                                                                                                                                                                                                | Sheet 1 of 1                 |                      | Samples   |      |            | Tests        |        |              |
|-----------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|-----------|------|------------|--------------|--------|--------------|
| Depth (m) | Legend                    | Description                                                                                                                                                                                    | Strata Depth (Thickness) (m) | Reduced Level (mAOD) | Depth (m) | Type | U100 Blows | Depth (m)    | SPT    | Installation |
| 0.00      |                           | MADE GROUND (Colliery discard consisting of loose grey clay bound fine to coarse gravel of angular and subangular mudstone, unburnt shale, burnt shale and coal. Pockets of clay present also) | (2.90)                       |                      | 0.00-1.50 | B    |            |              |        |              |
| 1.50      |                           |                                                                                                                                                                                                |                              |                      | 1.50-2.50 | B    |            | 1.50-1.95    | S = 10 |              |
| 2.90      |                           | Stiff grey and brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium subangular mudstone and coal.                                                                      | (1.35)                       | 70.40                | 2.90-3.00 | D    | 80         |              |        |              |
| 3.00      |                           |                                                                                                                                                                                                |                              |                      | 3.00-3.45 | U    |            |              |        |              |
| 3.45      |                           |                                                                                                                                                                                                |                              |                      | 3.45-3.60 | D    |            |              |        |              |
| 4.25      |                           | Very weak and weak very thinly bedded grey highly weathered MUDSTONE weathered to a stiff clay in pockets                                                                                      | (1.85)                       | 68.05                | 4.25-5.80 | B    |            | 4.25-4.70    | S = 39 |              |
| 5.80      |                           |                                                                                                                                                                                                |                              |                      | 5.80-6.12 |      |            | S = 78/170mm |        |              |
| 6.10      | End of Borehole at 6.10 m |                                                                                                                                                                                                | 6.10                         | 67.20                |           |      |            |              |        |              |
| 7.00      |                           |                                                                                                                                                                                                |                              |                      |           |      |            |              |        |              |
| 8.00      |                           |                                                                                                                                                                                                |                              |                      |           |      |            |              |        |              |
| 9.00      |                           |                                                                                                                                                                                                |                              |                      |           |      |            |              |        |              |

|              |                                   |                                      |                                              |                                                                                                                                                                                                  |
|--------------|-----------------------------------|--------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start Date   | 16/11/2007                        | Chiselling:<br>5.90m to 6.10m 0.5 hr | Water Strikes:<br>No Groundwater Encountered | Legend<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |
| End Date     | 16/11/2007                        |                                      |                                              |                                                                                                                                                                                                  |
| Method       | Cable Percussion - Dando 3000 rpm |                                      |                                              |                                                                                                                                                                                                  |
| Drilled By   | J.B. Site Investigations          |                                      |                                              |                                                                                                                                                                                                  |
| Logged By    | B. Johnson                        |                                      |                                              |                                                                                                                                                                                                  |
| Ground Level | 73.3 mAOD                         |                                      |                                              |                                                                                                                                                                                                  |
| Coordinates  | 433124E - 409518N                 |                                      |                                              |                                                                                                                                                                                                  |

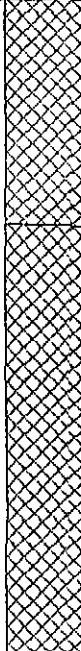
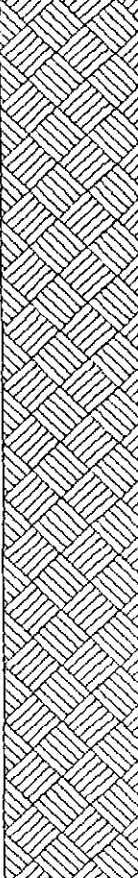
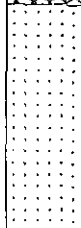
|           |                       |                   |
|-----------|-----------------------|-------------------|
| Remarks:  |                       |                   |
| Borehole: | BOREHOLE RECORD       | Revision: Final   |
| BH114     | North Gawber Colliery | Project No. 07053 |

  
**SCOTT DOHERTY ASSOCIATES**

| Strata                                   |        |                                                                                                                                                                                                                                           | Sheet 1 of 1                    |                                             | Samples      |      |                                                                                                                                                                                                   | Tests        |             |              |
|------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------|--------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|--------------|
| Depth<br>(m)                             | Legend | Description                                                                                                                                                                                                                               | Strata Depth<br>(Thickness) (m) | Reduced<br>Level (mAOD)                     | Depth<br>(m) | Type | U100<br>Blows                                                                                                                                                                                     | Depth<br>(m) | SPT         | Installation |
|                                          |        | MADE GROUND (Colliery discard consisting of medium dense clay bound fine to coarse gravel of ash, mudstone and occasional sandstone with rare cobbles of sandstone. Some cobbles of concrete and timber present in upper 1.5m of horizon) |                                 |                                             | 0.00-1.50    | B    |                                                                                                                                                                                                   |              |             |              |
| 1.00                                     |        |                                                                                                                                                                                                                                           |                                 |                                             | 1.50-3.00    | B    |                                                                                                                                                                                                   | 1.50-1.95    | S = 13      |              |
| 2.00                                     |        |                                                                                                                                                                                                                                           |                                 |                                             | 3.00-4.50    | B    |                                                                                                                                                                                                   | 3.00-3.45    | S = 12      |              |
| 3.00                                     |        |                                                                                                                                                                                                                                           | (7.30)                          |                                             | 4.50-6.00    | B    |                                                                                                                                                                                                   | 4.50-4.95    | S = 16      |              |
| 4.00                                     |        |                                                                                                                                                                                                                                           |                                 |                                             | 6.00-7.30    | B    |                                                                                                                                                                                                   | 6.00-6.45    | S = 23      |              |
| 5.00                                     |        |                                                                                                                                                                                                                                           |                                 |                                             | 7.30-7.50    | B    |                                                                                                                                                                                                   | 7.30-7.55    | S = 50/95mm |              |
| 6.00                                     |        | Very weak and weak very thinly bedded coarse grained SANDSTONE weathered to a stiff clay                                                                                                                                                  | 7.30                            | 64.60                                       |              |      |                                                                                                                                                                                                   |              |             |              |
| 7.00                                     |        | End of Borehole at 7.50 m                                                                                                                                                                                                                 | 7.50                            | 64.40                                       |              |      |                                                                                                                                                                                                   |              |             |              |
| 8.00                                     |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| 9.00                                     |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Start Date 19/11/2007                    |        | Chiselling:<br>5.10m to 5.35m 1 hr<br>7.30m to 7.50m 0.6 hr                                                                                                                                                                               |                                 | Water Strikes<br>No Groundwater Encountered |              |      | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |              |             |              |
| End Date 19/11/2007                      |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Method Cable Percussion - Dando 3000 rig |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Drilled By J.B. Site Investigations      |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Logged By E Johnson                      |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Ground Level 71.9 mAOD                   |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Coordinates 433050E - 409404N            |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Remarks                                  |        |                                                                                                                                                                                                                                           |                                 |                                             |              |      |                                                                                                                                                                                                   |              |             |              |
| Borehole:                                |        | BOREHOLE RECORD                                                                                                                                                                                                                           |                                 |                                             |              |      | Revision: Final                                                                                                                                                                                   |              |             |              |
| BH115                                    |        | North Gawber Colliery                                                                                                                                                                                                                     |                                 |                                             |              |      | Project No 07053                                                                                                                                                                                  |              |             |              |

| Strata                                                                                                                                                                                                                   |        |                                                                                                                                                                    | Sheet 1 of 1                 |                                              | Samples                |        |                                                                                                                                                                                                   | Tests     |           |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|--------------|
| Depth (m)                                                                                                                                                                                                                | Legend | Description                                                                                                                                                        | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                         | Depth (m)              | Type   | U100 Blows                                                                                                                                                                                        | Depth (m) | SPT       | Installation |
| 1.00                                                                                                                                                                                                                     |        | MADE GROUND (Colliery discard consisting of medium dense grey clay bound fine to coarse gravel of angular and subangular mudstone, sandstone, brick and timber).   | (1.50)                       |                                              | 0.00-1.50              | B      |                                                                                                                                                                                                   |           |           |              |
| 2.00                                                                                                                                                                                                                     |        | MADE GROUND (Colliery discard consisting of firm grey and dark grey gravelly clay. Gravel is fine and medium angular to subrounded ash, mudstone and burnt shale). | 1.50                         | 71.50                                        | 1.50-3.00              | B      |                                                                                                                                                                                                   | 1.50-1.95 | S = 23    |              |
| 3.00                                                                                                                                                                                                                     |        |                                                                                                                                                                    | (1.80)                       |                                              |                        |        |                                                                                                                                                                                                   | 3.00-3.45 | S = 12    |              |
| 4.00                                                                                                                                                                                                                     |        | Stiff grey mottled orange and brown gravelly CLAY. Gravel is fine and medium angular and subangular mudstone, sandstone and coal. Organic odour detected.          | 3.30                         | 69.70                                        | 3.30-3.45<br>3.45-3.90 | D<br>U | 68                                                                                                                                                                                                |           |           |              |
| 5.00                                                                                                                                                                                                                     |        |                                                                                                                                                                    | (0.90)                       |                                              | 3.90-4.05              | D      |                                                                                                                                                                                                   |           |           |              |
| 6.00                                                                                                                                                                                                                     |        | Very weak and weak wet very thinly bedded grey MUDSTONE weathered to a stiff clay in pockets                                                                       | 4.20                         | 68.80                                        | 4.20-5.70              | B      |                                                                                                                                                                                                   | 4.20-4.65 | S = 31    |              |
| 7.00                                                                                                                                                                                                                     |        |                                                                                                                                                                    | (4.60)                       |                                              | 5.70-7.20              | B      |                                                                                                                                                                                                   | 5.70-6.15 | S = 45    |              |
| 8.00                                                                                                                                                                                                                     |        |                                                                                                                                                                    |                              |                                              | 7.20-7.40<br>7.40-8.50 | D<br>B |                                                                                                                                                                                                   | 7.40-7.85 | S = 51    |              |
| 9.00                                                                                                                                                                                                                     |        | End of Borehole at 8.80 m                                                                                                                                          | 8.80                         | 64.20                                        | 8.50-8.80              | B      |                                                                                                                                                                                                   | 8.50-8.61 | S = 0/0mm |              |
| Start Date: 19/11/2007<br>End Date: 19/11/2007<br>Method: Cable Percussion - Dando 3000 rig<br>Drilled By: J.B. Site Investigations<br>Logged By: B Johnson<br>Ground Level: 73.0 mAOD<br>Coordinates: 432990E - 409517N |        | Chiselling:<br>1.70m to 1.80m : 1 hr<br>8.85m to 8.80m : 0.5 hr                                                                                                    |                              | Water Strikes:<br>No Groundwater Encountered |                        |        | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |           |              |
| Remarks:                                                                                                                                                                                                                 |        |                                                                                                                                                                    |                              |                                              |                        |        |                                                                                                                                                                                                   |           |           |              |
| Borehole:                                                                                                                                                                                                                |        | BOREHOLE RECORD                                                                                                                                                    |                              |                                              |                        |        | Revision: Final                                                                                                                                                                                   |           |           |              |
| BH116                                                                                                                                                                                                                    |        | North Gawber Colliery                                                                                                                                              |                              |                                              |                        |        | Project No. 07053                                                                                                                                                                                 |           |           |              |
|                                                                                                                                                                                                                          |        |                                                                                                                                                                    |                              |                                              |                        |        |                                                                                                                                                                                                   |           |           |              |



| Strata                                                                                |                                                                                    |                                                                                                                                                                                                 | Sheet 1 of 1                 |                                           | Samples   |      |                                                                                                                                                                                                   | Tests     |              |                                                                                      |
|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------|-----------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|--------------------------------------------------------------------------------------|
| Depth (m)                                                                             | Legend                                                                             | Description                                                                                                                                                                                     | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                      | Depth (m) | Type | U100 Blows                                                                                                                                                                                        | Depth (m) | SPT          | Installation                                                                         |
| 1.00                                                                                  |   | MADE GROUND (Colliery discard consisting of grey clay bound fine to coarse gravel of subangular ash, mudstone, sandstone and rare burnt shale).                                                 | (1.50)                       |                                           | 0.00-1.50 | B    |                                                                                                                                                                                                   |           |              |  |
| 2.00                                                                                  |                                                                                    | MADE GROUND (Colliery discard consisting of soft wet black slightly gravelly silt with pockets of clay. Gravel is fine and medium subangular mudstone and coal. Strong organic odour detected). | 1.50                         | 73.20                                     | 1.50-3.00 | B    |                                                                                                                                                                                                   | 1.50-1.95 | S = 5        |                                                                                      |
| 3.00                                                                                  |                                                                                    |                                                                                                                                                                                                 | (2.80)                       |                                           | 3.00-4.30 | B    |                                                                                                                                                                                                   | 3.00-3.45 | S = 1        |                                                                                      |
| 4.00                                                                                  |                                                                                    |                                                                                                                                                                                                 | 4.30                         | 70.40                                     | 4.30-5.70 | B    |                                                                                                                                                                                                   | 4.30-4.75 | S = 27       |                                                                                      |
| 5.00                                                                                  |  | Very weak and weak very thin bedded highly weathered medium grained SANDSTONE.                                                                                                                  | (1.50)                       |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| 6.00                                                                                  |                                                                                    | End of Borehole at 5.80 m                                                                                                                                                                       | 5.80                         | 66.90                                     |           |      |                                                                                                                                                                                                   | 5.70-6.03 | S = 50/180mm |                                                                                      |
| 7.00                                                                                  |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| 8.00                                                                                  |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| 9.00                                                                                  |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Start Date: 20/11/2007                                                                |                                                                                    | Chiselling: 5.70m to 5.80m : 0.5 hr                                                                                                                                                             |                              | Water Strikes: No Groundwater Encountered |           |      | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |              |                                                                                      |
| End Date: 20/11/2007                                                                  |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Method: Cable Percussion - Dando 3000 rpm                                             |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Drilled By: J.B. Site Investigations                                                  |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Logged By: S Johnson                                                                  |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Ground Level: 74.7 mAOD                                                               |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Coordinates: 432866E - 409596N                                                        |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Remarks:                                                                              |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |
| Borehole: BH117                                                                       |                                                                                    | BOREHOLE RECORD<br>North Gawber Colliery                                                                                                                                                        |                              |                                           |           |      | Revision: Final<br>Project No. 07053                                                                                                                                                              |           |              |                                                                                      |
|  |                                                                                    |                                                                                                                                                                                                 |                              |                                           |           |      |                                                                                                                                                                                                   |           |              |                                                                                      |

| Strata                                   |        |                                                                                                                                        |                              | Sheet 1 of 1                              |           | Samples          |                                                                                                                                                                                                   |           | Tests       |              |  |
|------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------|-----------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|--------------|--|
| Depth (m)                                | Legend | Description                                                                                                                            | Strata Depth (Thickness) (m) | Reduced Level (mAOD)                      | Depth (m) | Type             | U100 Blows                                                                                                                                                                                        | Depth (m) | SPT         | Installation |  |
| 1.00                                     |        | MADE GROUND (Colliery discard consisting of wet grey clay bound fine to coarse gravel of angular to subrounded mudstone and rare coal) | (1.50)                       |                                           | 0.00-1.50 | B                |                                                                                                                                                                                                   |           |             |              |  |
| 2.00                                     |        | MADE GROUND (Colliery discard consisting of soft wet grey gravelly clay. Gravel is fine to coarse mudstone. Remnant roots present).    | 1.50                         | 73.80                                     | 1.50-4.20 | B                |                                                                                                                                                                                                   | 1.50-1.95 | S = 1       |              |  |
| 3.00                                     |        |                                                                                                                                        | (2.70)                       |                                           |           |                  |                                                                                                                                                                                                   | 3.00-3.45 | S = 1       |              |  |
| 4.00                                     |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| 5.00                                     |        | Very weak very thinly bedded orangish brown highly weathered coarse grained SANDSTONE with thin bands of MUDSTONE                      | 4.20                         | 71.10                                     | 4.20-5.10 | B                |                                                                                                                                                                                                   | 4.20-4.44 | S = 50/90mm |              |  |
| 6.00                                     |        | End of Borehole at 5.20 m                                                                                                              | 5.20                         | 70.10                                     |           |                  |                                                                                                                                                                                                   | 5.10-5.19 | S = 0/0mm   |              |  |
| 7.00                                     |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| 8.00                                     |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| 9.00                                     |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Start Date 19/11/2007                    |        | Chiselling: 5.10m to 5.20m 0.5 hr                                                                                                      |                              | Water Strikes: No Groundwater Encountered |           |                  | Legend:<br>D Small Disturbed Sample<br>B Large Disturbed Sample<br>U Undisturbed U100 Sample<br>W Water Sample<br>S Standard Penetration Test (Split Spoon)<br>C Standard Penetration Test (Cone) |           |             |              |  |
| End Date 19/11/2007                      |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Method Cable Percussion - Dando 3000 rig |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Drilled By J.B. Site Investigations      |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Logged By B. Johnson                     |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Ground Level 75.3 mAOD                   |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Coordinates 432805E - 409618N            |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Remarks                                  |        |                                                                                                                                        |                              |                                           |           |                  |                                                                                                                                                                                                   |           |             |              |  |
| Borehole: BH118                          |        | BOREHOLE RECORD                                                                                                                        |                              |                                           |           | Revision: Final  |                                                                                                                                                                                                   |           |             |              |  |
|                                          |        | North Gawber Colliery                                                                                                                  |                              |                                           |           | Project No 07053 |                                                                                                                                                                                                   |           |             |              |  |

**APPENDIX E**  
**Geotechnical Laboratory Test Certificates**

# SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Trial Pit Number | Sample Number | Depth m | Description of Sample                                     |
|------------------|---------------|---------|-----------------------------------------------------------|
| TP6              |               | 2.50    | Brown slightly gravelly slightly sandy CLAY.              |
| TP7              |               | 3.00    | Dark grey gravelly slightly sandy CLAY.                   |
| TP14             |               | 4.00    | Brown mottled grey CLAY.                                  |
| TP18             |               | 2.00    | Brown very gravelly very sandy CLAY.                      |
| TP21             |               | 4.00    | Brown mottled grey slightly gravelly slightly sandy CLAY. |
| TP25             |               | 4.00    | Dark grey slightly gravelly slightly sandy CLAY.          |
| TP29             |               | 3.50    | Dark grey gravelly slightly sandy CLAY.                   |
| TP31             |               | 1.00    | Brown slightly gravelly slightly sandy CLAY.              |
| TP40             |               | 1.70    | Brown mottled grey slightly gravelly slightly sandy CLAY. |
| TP45             |               | 1.20    | Grey mottled brown slightly gravelly slightly sandy CLAY. |
| TP46             |               | 2.20    | Brown mottled grey slightly gravelly slightly sandy CLAY. |
| TP55             |               | 3.50    | Brown slightly sandy CLAY.                                |
| TP57             |               | 4.20    | Grey slightly gravelly slightly sandy CLAY.               |
| TP59             |               | 2.70    | Grey mottled brown slightly gravelly slightly sandy CLAY. |
| TP64             |               | 3.50    | Brown slightly sandy CLAY                                 |
| TP70             |               | 3.50    | Brown slightly gravelly slightly sandy CLAY.              |
| TP74             |               | 1.00    | Dark brown gravelly sandy CLAY.                           |
|                  |               |         |                                                           |
|                  |               |         |                                                           |

**PSL**

**Professional Soils Laboratory**

|                        |         |                    |         |                    |                         |
|------------------------|---------|--------------------|---------|--------------------|-------------------------|
| Compiled by            | Date    | Checked by         | Date    | Approved by        | Date                    |
| <i>[Signature]</i>     | 5/12/07 | <i>[Signature]</i> | 5/12/07 | <i>[Signature]</i> | 5/12/07                 |
| NORTH GAWBER COLLIERY. |         |                    |         |                    | Contract No: PSL07/2659 |
|                        |         |                    |         |                    | Client Ref: 07053       |

## SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

## Professional Soils Laboratory

|                                                                                      |         |                                                                                       |         |                                                                                       |                         |
|--------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|-------------------------|
| Compiled by                                                                          | Date    | Checked by                                                                            | Date    | Approved by                                                                           | Date                    |
|  | 6/12/07 |  | 6/12/07 |  | 6/12/07                 |
| NORTH GAWBER COLLIERY.                                                               |         |                                                                                       |         |                                                                                       | Contract No: PSL07/2655 |
|                                                                                      |         |                                                                                       |         |                                                                                       | Client Ref: 07053       |

## SUMMARY OF LABORATORY SOIL DESCRIPTIONS

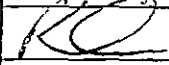
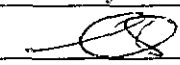
[illegible]

## Professional Soils Laboratory

|                                                                                      |         |                                                                                       |         |                                                                                       |         |
|--------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|
| Compiled by                                                                          | Date    | Checked by                                                                            | Date    | Approved by                                                                           | Date    |
|  | 4/12/07 |  | 4/12/07 |  | 4/12/07 |
| NORTH GAWBER COLLIERY.                                                               |         |                                                                                       |         | Contract No: PSL07/265                                                                |         |
|                                                                                      |         |                                                                                       |         | Client Ref: 07053                                                                     |         |

# SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Trial Pit Number | Sample Number | Depth m | Description of Sample                                              |
|------------------|---------------|---------|--------------------------------------------------------------------|
| TP6              |               | 0.70    | MADE GROUND dark grey very gravelly silty sand of ash & clinker.   |
| TP6              |               | 2.00    | MADE GROUND dark grey very gravelly clayey sand of ash & clinker.  |
| TP8              |               | 0.60    | MADE GROUND brown gravelly sandy clay.                             |
| TP8              |               | 1.80    | MADE GROUND dark brown very gravelly very sandy clay.              |
| TP12             |               | 0.80    | MADE GROUND brown gravelly sandy clay.                             |
| TP13             |               | 2.20    | MADE GROUND dark grey very sandy clayey gravel.                    |
| TP17             |               | 2.00    | MADE GROUND grey mottled brown very gravelly sandy clay.           |
| TP20             |               | 2.50    | MADE GROUND dark grey very sandy clayey gravel with ash & clinker. |
| TP21             |               | 1.00    | MADE GROUND dark grey very gravelly silty sand of ash & clinker.   |
| TP23             |               | 1.50    | MADE GROUND dark grey very gravelly silty sand of ash & clinker.   |
| TP25             |               | 1.00    | MADE GROUND dark grey very sandy silty gravel of ash & clinker.    |
| TP29             |               | 1.50    | MADE GROUND brown slightly gravelly sandy clay.                    |
| TP29             |               | 2.50    | MADE GROUND dark grey slightly gravelly sandy clay.                |
| TP32             |               | 0.50    | MADE GROUND dark grey sandy clayey gravel.                         |
| TP32             |               | 1.70    | MADE GROUND dark grey gravelly sandy clay.                         |
| TP35             |               | 1.00    | MADE GROUND dark grey very sandy clayey gravel with ash & clinker. |
| TP44             |               | 1.00    | MADE GROUND dark grey gravelly sandy clay.                         |
| TP46             |               | 1.00    | MADE GROUND dark grey very sandy very clayey gravel.               |
| TP48             |               | 2.00    | MADE GROUND brown very sandy clayey gravel.                        |

|                                                                                                                             |                                                                                      |          |                                                                                       |          |                                                                                       |                         |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|-------------------------|
| <br><b>Professional Soils Laboratory</b> | Compiled by                                                                          | Date     | Checked by                                                                            | Date     | Approved by                                                                           | Date                    |
|                                                                                                                             |  | 12/12/11 |  | 12/12/11 |  | 12/12/11                |
|                                                                                                                             | NORTH GAWBER COLLIERY.                                                               |          |                                                                                       |          |                                                                                       |                         |
|                                                                                                                             |                                                                                      |          |                                                                                       |          |                                                                                       | Contract No: PSL07/2659 |
|                                                                                                                             |                                                                                      |          |                                                                                       |          |                                                                                       | Client Ref: 07053       |

## SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

|                                                                                                                                                                          |                                                                                      |          |                                                                                       |          |                                                                                       |                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|------------------------|
| <div style="text-align: center;">  <p><b>Professional Soils Laboratory</b></p> </div> | Compiled by                                                                          | Date     | Checked by                                                                            | Date     | Approved by                                                                           | Date                   |
|                                                                                                                                                                          |  | 12/12/01 |  | 12/12/01 |  | 12/12/01               |
| NORTH GAWBER COLLIERY.                                                                                                                                                   |                                                                                      |          |                                                                                       |          |                                                                                       | Contract No: PSL07/265 |
|                                                                                                                                                                          |                                                                                      |          |                                                                                       |          |                                                                                       | Client Ref: 07053      |



## SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

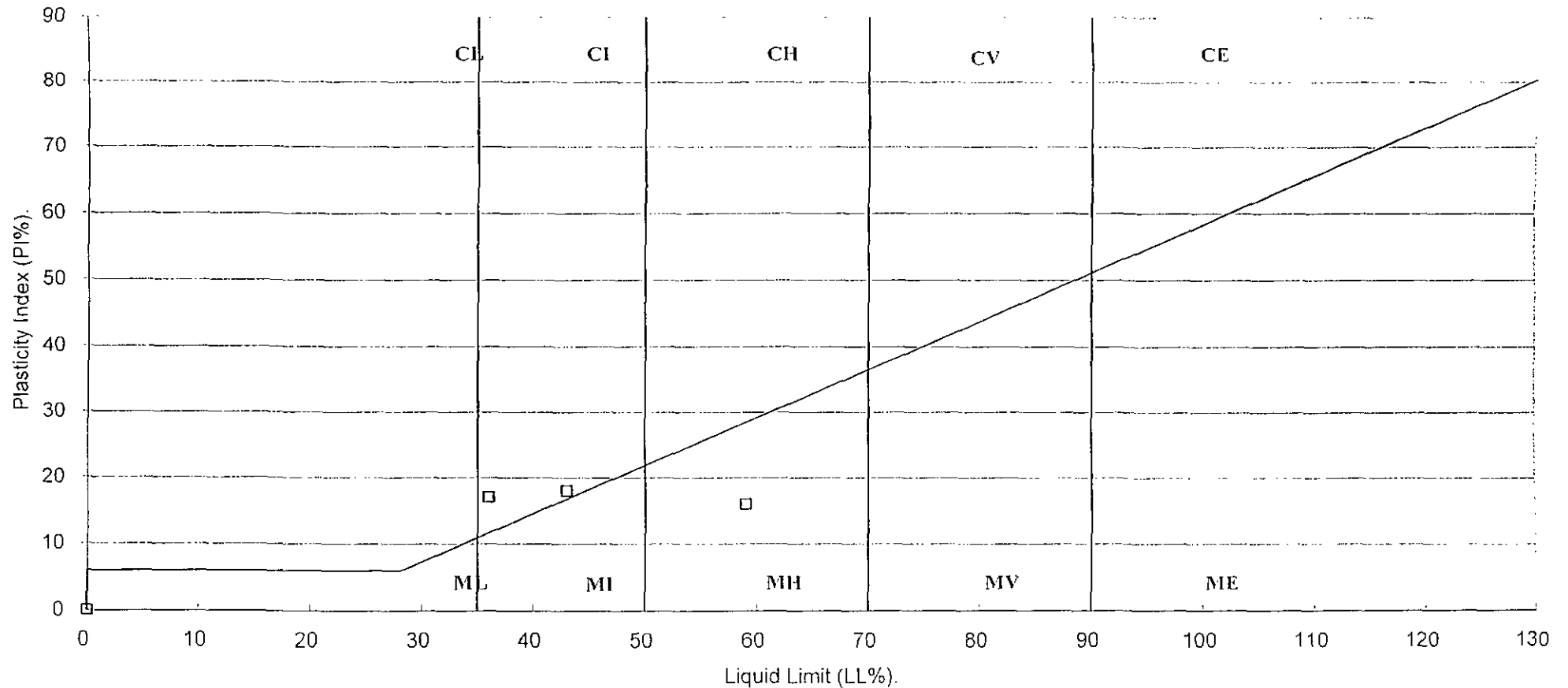
**SYMBOLS :** NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

|                                                                                                                                                                          |                                                                                      |         |                                                                                       |         |                                                                                       |                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------------------------------------------|
| <div style="text-align: center;">  <p><b>Professional Soils Laboratory</b></p> </div> | Compiled by                                                                          | Date    | Checked by                                                                            | Date    | Approved by                                                                           | Date                                        |
|                                                                                                                                                                          |  | 6/12/07 |  | 6/12/07 |  | 6/12/07                                     |
|                                                                                                                                                                          | NORTH GAWBER COLLIERY.                                                               |         |                                                                                       |         |                                                                                       | Contract No: PSL07/265<br>Client Ref: 07053 |

# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



**PSL**

**Professional Soils Laboratory**

Compiled by

Date

Checked by

Date

Approved by

Date

*[Signature]*

6/12/07

*[Signature]*

6/12/07

*[Signature]*

6/12/07

NORTH GAWBER COLLIERY.

Contract No: PSL07/2659

Client Ref: 07053

# SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

| Trial Pit Number | Sample Number | Depth m | Moisture Content %<br>Clause 3.2 | Bulk Density Mg/m <sup>3</sup><br>Clause 7.2 | Dry Density Mg/m <sup>3</sup><br>Clause 7.2 | Particle Density Mg/m <sup>3</sup><br>Clause 8. | Liquid Limit %<br>Clause 4.3/4.4 | Plastic Limit %<br>Clause 5. | Plasticity Index %<br>Clause 5. | % Passing .425mm | Remarks                     |
|------------------|---------------|---------|----------------------------------|----------------------------------------------|---------------------------------------------|-------------------------------------------------|----------------------------------|------------------------------|---------------------------------|------------------|-----------------------------|
| TP6              |               | 2.50    | 31                               |                                              |                                             |                                                 | 57                               | 28                           | 29                              | 94               | High plasticity CH.         |
| TP7              |               | 3.00    | 24                               |                                              |                                             |                                                 | 46                               | 20                           | 26                              | 90               | Intermediate plasticity CI. |
| TP14             |               | 4.00    | 20                               |                                              |                                             |                                                 | 48                               | 20                           | 28                              | 100              | Intermediate plasticity CI. |
| TP18             |               | 2.00    | 14                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP21             |               | 4.00    | 24                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP25             |               | 4.00    | 30                               |                                              |                                             |                                                 | 48                               | 22                           | 26                              | 97               | Intermediate plasticity CI. |
| TP29             |               | 3.50    | 33                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP31             |               | 1.00    | 22                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP40             |               | 1.70    | 26                               |                                              |                                             |                                                 | 52                               | 21                           | 31                              | 91               | High plasticity CH.         |
| TP45             |               | 1.20    | 22                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP46             |               | 2.20    | 28                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP55             |               | 3.50    | 24                               |                                              |                                             |                                                 | 51                               | 21                           | 30                              | 100              | High plasticity CH.         |
| TP57             |               | 4.20    | 21                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP59             |               | 2.70    | 24                               |                                              |                                             |                                                 | 47                               | 20                           | 27                              | 93               | Intermediate plasticity CI. |
| TP64             |               | 3.50    | 25                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP70             |               | 3.50    | 28                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP74             |               | 1.00    | 23                               |                                              |                                             |                                                 | 46                               | 23                           | 23                              | 82               | Intermediate plasticity CI. |
|                  |               |         |                                  |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
|                  |               |         |                                  |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |

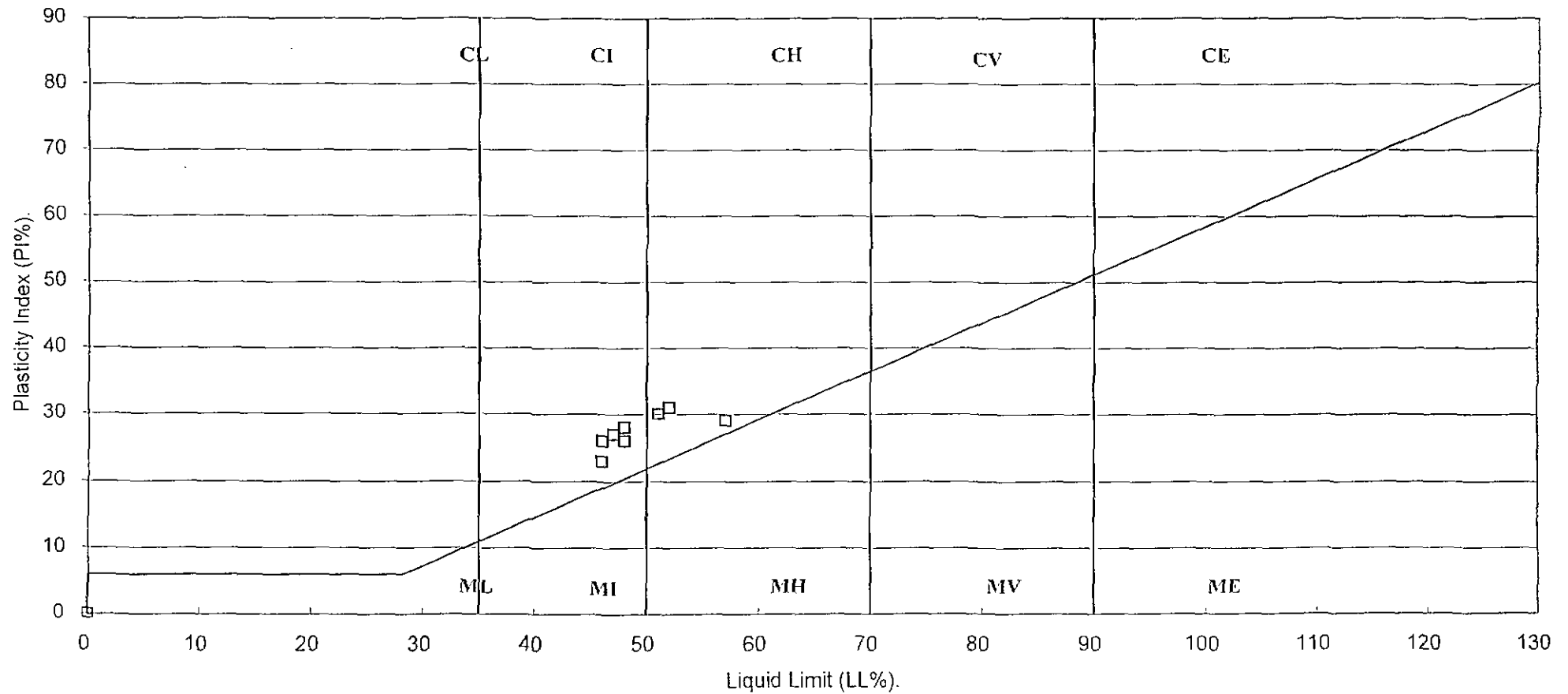
SYMBOLS : NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

|                                                                                                                             |                                                                                      |         |                                                                                       |         |                                                                                       |                         |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|-------------------------|
| <br><b>Professional Soils Laboratory</b> | Compiled by                                                                          | Date    | Checked by                                                                            | Date    | Approved by                                                                           | Date                    |
|                                                                                                                             |  | 5/12/07 |  | 5/12/07 |  | 5/12/07                 |
|                                                                                                                             | NORTH GAWBER COLLIERY.                                                               |         |                                                                                       |         |                                                                                       | Contract No: PSL07/2659 |
|                                                                                                                             |                                                                                      |         |                                                                                       |         | Client Ref: 07053                                                                     |                         |

# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



|                                                                                                                             |                        |         |                    |         |                    |                         |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------|---------|--------------------|---------|--------------------|-------------------------|
| <br><b>Professional Soils Laboratory</b> | Compiled by            | Date    | Checked by         | Date    | Approved by        | Date                    |
|                                                                                                                             | <i>[Signature]</i>     | 5/12/07 | <i>[Signature]</i> | 5/12/07 | <i>[Signature]</i> | 5/12/07                 |
|                                                                                                                             | NORTH GAWBER COLLIERY. |         |                    |         |                    |                         |
|                                                                                                                             |                        |         |                    |         |                    | Contract No: PSL07/2659 |
|                                                                                                                             |                        |         |                    |         |                    | Client Ref: 07053       |

## SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

**SYMBOLS :** NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

|                                                                                                                             |                                                                                      |         |                                                                                       |         |                                                                                       |                         |  |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|-------------------------|--|
| <br><b>Professional Soils Laboratory</b> | Compiled by                                                                          | Date    | Checked by                                                                            | Date    | Approved by                                                                           | Date                    |  |
|                                                                                                                             |  | 4/12/07 |  | 4/12/07 |  | 4/12/07                 |  |
| NORTH GAWBER COLLIERY.                                                                                                      |                                                                                      |         |                                                                                       |         |                                                                                       | Contract No: PSL07/2659 |  |
|                                                                                                                             |                                                                                      |         |                                                                                       |         |                                                                                       | Client Ref: 07053       |  |

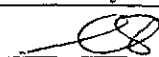
# SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

| Trial Pit Number | Sample Number | Depth m | Moisture Content %<br>Clause 3.2 | Bulk Density Mg/m <sup>3</sup><br>Clause 7.2 | Dry Density Mg/m <sup>3</sup><br>Clause 7.2 | Particle Density Mg/m <sup>3</sup><br>Clause 8. | Liquid Limit %<br>Clause 4.3/4.4 | Plastic Limit %<br>Clause 5. | Plasticity Index %<br>Clause 5. | % Passing .425mm | Remarks                     |
|------------------|---------------|---------|----------------------------------|----------------------------------------------|---------------------------------------------|-------------------------------------------------|----------------------------------|------------------------------|---------------------------------|------------------|-----------------------------|
| TP6              |               | 0.70    | 13                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP6              |               | 2.00    | 23                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP8              |               | 0.60    | 19                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP8              |               | 1.80    | 20                               |                                              |                                             |                                                 | 40                               | 21                           | 19                              | 56               | Intermediate plasticity CI. |
| TP12             |               | 0.80    | 18                               |                                              |                                             |                                                 | 39                               | 20                           | 19                              | 77               | Intermediate plasticity CI. |
| TP13             |               | 2.20    | 11                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP17             |               | 2.00    | 14                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP20             |               | 2.50    | 14                               |                                              |                                             |                                                 |                                  | NP                           |                                 |                  |                             |
| TP21             |               | 1.00    | 22                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP23             |               | 1.50    | 20                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP25             |               | 1.00    | 18                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP29             |               | 1.50    | 26                               |                                              |                                             |                                                 | 47                               | 23                           | 24                              | 89               | Intermediate plasticity CI. |
| TP29             |               | 2.50    | 18                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP32             |               | 0.50    | 8.9                              |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP32             |               | 1.70    | 12                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP35             |               | 1.00    | 12                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP44             |               | 1.00    | 17                               |                                              |                                             |                                                 | 37                               | 20                           | 17                              | 87               | Intermediate plasticity CI. |
| TP46             |               | 1.00    | 14                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| TP48             |               | 2.00    | 14                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |

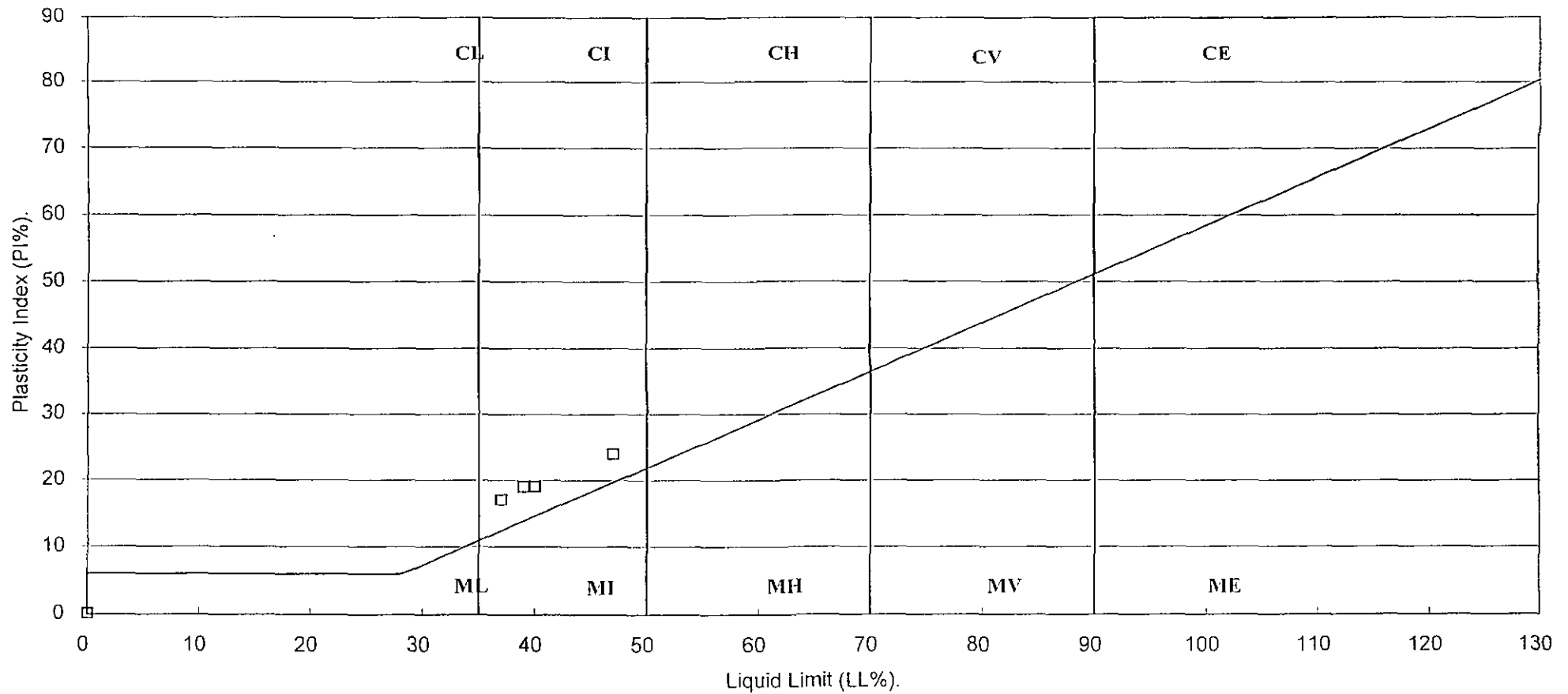
SYMBOLS : NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

|                                                                                                                             |                                                                                      |          |                                                                                       |          |                                                                                       |                         |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|-------------------------|
| <br><b>Professional Soils Laboratory</b> | Compiled by                                                                          | Date     | Checked by                                                                            | Date     | Approved by                                                                           | Date                    |
|                                                                                                                             |  | 12/12/01 |  | 12/12/01 |  | 12/12/01                |
|                                                                                                                             | NORTH GAWBER COLLIERY.                                                               |          |                                                                                       |          |                                                                                       | Contract No: PSL07/2659 |
|                                                                                                                             |                                                                                      |          |                                                                                       |          | Client Ref: 07053                                                                     |                         |

# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



**PSL**

**Professional Soils Laboratory**

Compiled by

*[Signature]*

Date

12/12/11

Checked by

*[Signature]*

Date

12/12/11

Approved by

*[Signature]*

Date

12/12/11

NORTH GAWBER COLLIERY.

Contract No: PSL07/2659

Client Ref: 07053

## SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

**SYMBOLS :** NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.



## Professional Soils Laboratory

Compiled by:

Date \_\_\_\_\_

Checked by

Date \_\_\_\_\_

Approved by

Date \_\_\_\_\_

NORTH GAWBER COLLIERY.

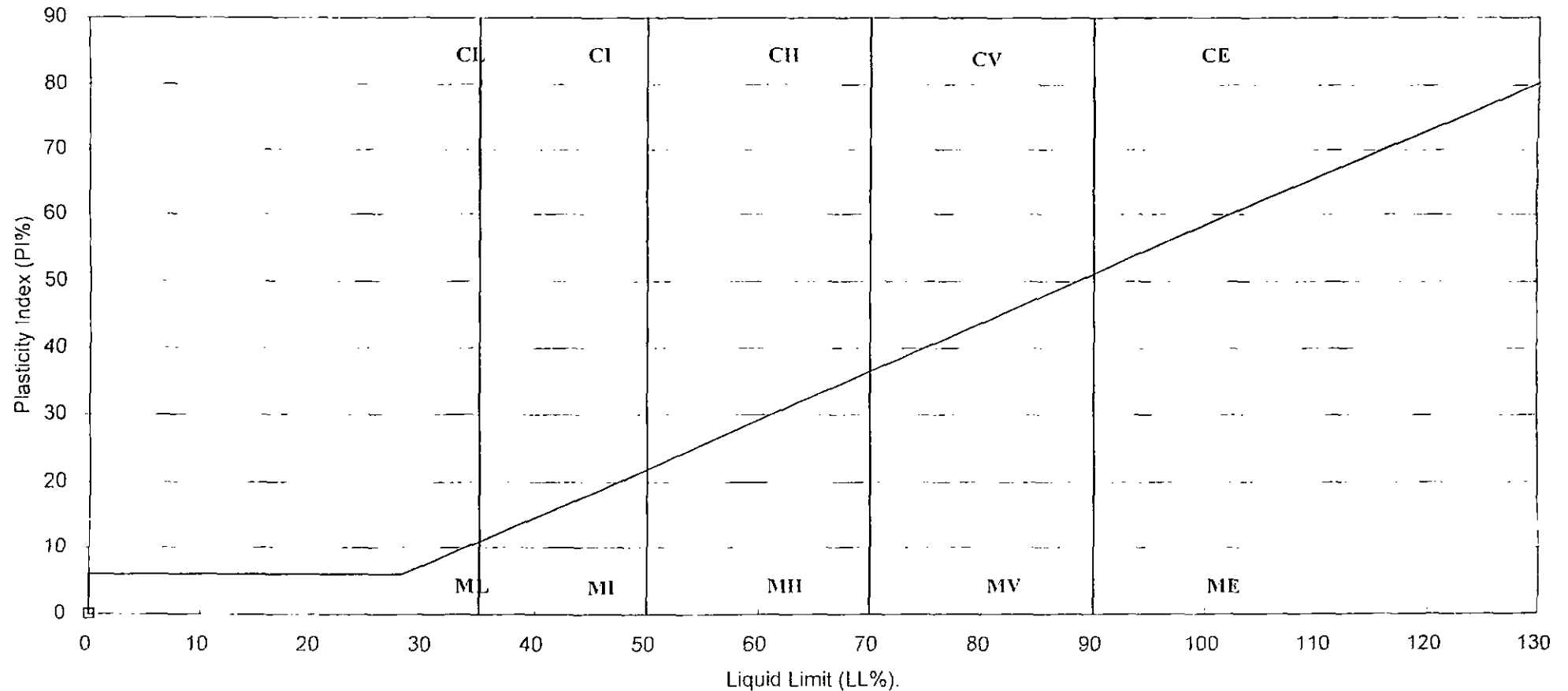
Contract No: PSL07/2659

Client Ref: 07053



# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



**PSL**

**Professional Soils Laboratory**

| Compiled by            | Date     | Checked by         | Date     | Approved by        | Date                    |
|------------------------|----------|--------------------|----------|--------------------|-------------------------|
| <i>[Signature]</i>     | 12/12/11 | <i>[Signature]</i> | 12/12/11 | <i>[Signature]</i> | 12/12/11                |
| NORTH GAWBER COLLIERY. |          |                    |          |                    | Contract No: PSL07/2659 |
|                        |          |                    |          |                    | Client Ref: 07053       |

## SUMMARY OF SOIL COMPACTION RELATED TESTS

(B.S. 1377 : PART 4 : 1990)

[illegible]

\*: Assumed Particle Density.

Sheet 1 of 1.

|                                                                                                                             |                                                                                     |          |                                                                                       |          |                                                                                       |                         |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------|-------------------------|
| <br><b>Professional Soils Laboratory</b> | Compiled by                                                                         | Date     | Checked by                                                                            | Date     | Approved by                                                                           | Date                    |
|                                                                                                                             |  | 12/12/19 |  | 14/12/19 |  | 12/12/19                |
|                                                                                                                             | NORTH GAWBER COLLIERY.                                                              |          |                                                                                       |          |                                                                                       | Contract No. PSL07/2659 |
|                                                                                                                             |                                                                                     |          |                                                                                       |          |                                                                                       | Figure: 07053           |

## SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Borehole Number | Sample Type | Depth m     | Description of Sample                                                  |
|-----------------|-------------|-------------|------------------------------------------------------------------------|
| BH101           | B           | 1.50-2.00   | MADE GROUND dark brown very sandy very clayey gravel.                  |
| BH102           | B           | 3.00-3.50   | MADE GROUND dark grey gravelly sandy clay.                             |
| BH102           | B           | 6.00-6.50   | MADE GROUND brown very gravelly sandy clay.                            |
| BH102           | B           | 10.00-10.40 | Firm greyish brown slightly gravelly sandy CLAY.                       |
| BH103           | B           | 1.50-3.00   | MADE GROUND dark reddish brown very gravelly sandy clay.               |
| BH103           | B           | 5.60-7.00   | MADE GROUND reddish brown very sandy clayey gravel.                    |
| BH104           | B           | 3.00-3.50   | MADE GROUND grey gravelly sandy clay.                                  |
| BH105           | B           | 1.00-1.50   | MADE GROUND brown very gravelly very sandy clay.                       |
| BH105           | B           | 4.00-4.50   | MADE GROUND dark brown clayey very sandy gravel.                       |
| BH106           | B           | 4.50-6.00   | MADE GROUND dark brown and grey sandy clayey gravel with many cobbles. |
| BH107A          | B           | 2.50-3.00   | MADE GROUND brown very gravelly sandy clay.                            |
| BH110           | B           | 1.80-3.20   | MADE GROUND dark brown very gravelly sandy clay.                       |
| BH110           | U           | 4.30-4.70   | Stiff brown mottled grey slightly sandy CLAY.                          |
| BH111           | B           | 0.00-1.50   | MADE GROUND reddish brown very sandy clayey gravel.                    |
| BH111           | U           | 4.00-4.40   | Stiff brown mottled grey sandy CLAY.                                   |
| BH112           | B           | 0.20-1.50   | MADE GROUND dark grey gravelly slightly sandy clay.                    |
| BH112           | U           | 3.20-3.60   | Firm brown mottled grey slightly gravelly sandy CLAY.                  |
| BH113           | B           | 1.50-3.00   | MADE GROUND dark brown very sandy clayey gravel.                       |
| BH115           | B           | 4.50-6.00   | MADE GROUND grey very gravelly very sandy clay.                        |

|                                                                                                                                                                          |                                                                                      |        |                                                                                       |        |                                                                                       |                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|-------------------------|
| <div style="text-align: center;">  <p><b>Professional Soils Laboratory</b></p> </div> | Compiled by                                                                          | Date   | Checked by                                                                            | Date   | Approved by                                                                           | Date                    |
|                                                                                                                                                                          |  | 8/1/08 |  | 8/1/08 |  | 8/1/08                  |
|                                                                                                                                                                          | NORTH GAWBER.                                                                        |        |                                                                                       |        |                                                                                       | Contract No: PSL07/2904 |
|                                                                                                                                                                          |                                                                                      |        |                                                                                       |        |                                                                                       | Client Ref: 07053       |

## SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

## Professional Soils Laboratory

|                                                                                      |        |                                                                                       |        |                                                                                       |                         |
|--------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|-------------------------|
| Compiled by                                                                          | Date   | Checked by                                                                            | Date   | Approved by                                                                           | Date                    |
|  | 8/1/08 |  | 8/1/08 |  | 8/1/08                  |
| NORTH GAWBER.                                                                        |        |                                                                                       |        |                                                                                       | Contract No: PSL07/2904 |
|                                                                                      |        |                                                                                       |        |                                                                                       | Client Ref: 07053       |

# SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

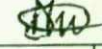
| Borehole Number | Sample Type | Depth m     | Moisture Content %<br>Clause 3.2 | Bulk Density Mg/m <sup>3</sup><br>Clause 7.2 | Dry Density Mg/m <sup>3</sup><br>Clause 7.2 | Particle Density Mg/m <sup>3</sup><br>Clause 8. | Liquid Limit %<br>Clause 4.3/4.4 | Plastic Limit %<br>Clause 5. | Plasticity Index %<br>Clause 5. | % Passing .425mm | Remarks                     |
|-----------------|-------------|-------------|----------------------------------|----------------------------------------------|---------------------------------------------|-------------------------------------------------|----------------------------------|------------------------------|---------------------------------|------------------|-----------------------------|
| BH101           | B           | 1.50-2.00   | 18                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH102           | B           | 3.00-3.50   | 23                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH102           | B           | 6.00-6.50   | 17                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH102           | B           | 10.00-10.40 | 27                               |                                              |                                             |                                                 | 46                               | 20                           | 26                              | 96               | Intermediate plasticity CI. |
| BH103           | B           | 1.50-3.00   | 21                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH103           | B           | 5.60-7.00   | 22                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH104           | B           | 3.00-3.50   | 14                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH105           | B           | 1.00-1.50   | 25                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH105           | B           | 4.00-4.50   | 27                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH106           | B           | 4.50-6.00   | 15                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH107A          | B           | 2.50-3.00   | 22                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH110           | B           | 1.80-3.20   | 19                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH110           | U           | 4.30-4.70   | 21                               |                                              |                                             |                                                 | 55                               | 25                           | 30                              | 100              | High plasticity CH.         |
| BH111           | B           | 0.00-1.50   | 16                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH111           | U           | 4.00-4.40   | 24                               |                                              |                                             |                                                 | 41                               | 22                           | 19                              | 100              | Intermediate plasticity CI. |
| BH112           | B           | 0.20-1.50   | 41                               |                                              |                                             |                                                 | 50                               | 23                           | 27                              | 80               | Intermediate plasticity CI. |
| BH112           | U           | 3.20-3.60   | 26                               |                                              |                                             |                                                 | 44                               | 21                           | 23                              | 92               | Intermediate plasticity CI. |
| BH113           | B           | 1.50-3.00   | 19                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |
| BH115           | B           | 4.50-6.00   | 19                               |                                              |                                             |                                                 |                                  |                              |                                 |                  |                             |

SYMBOLS : NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

**PSL**

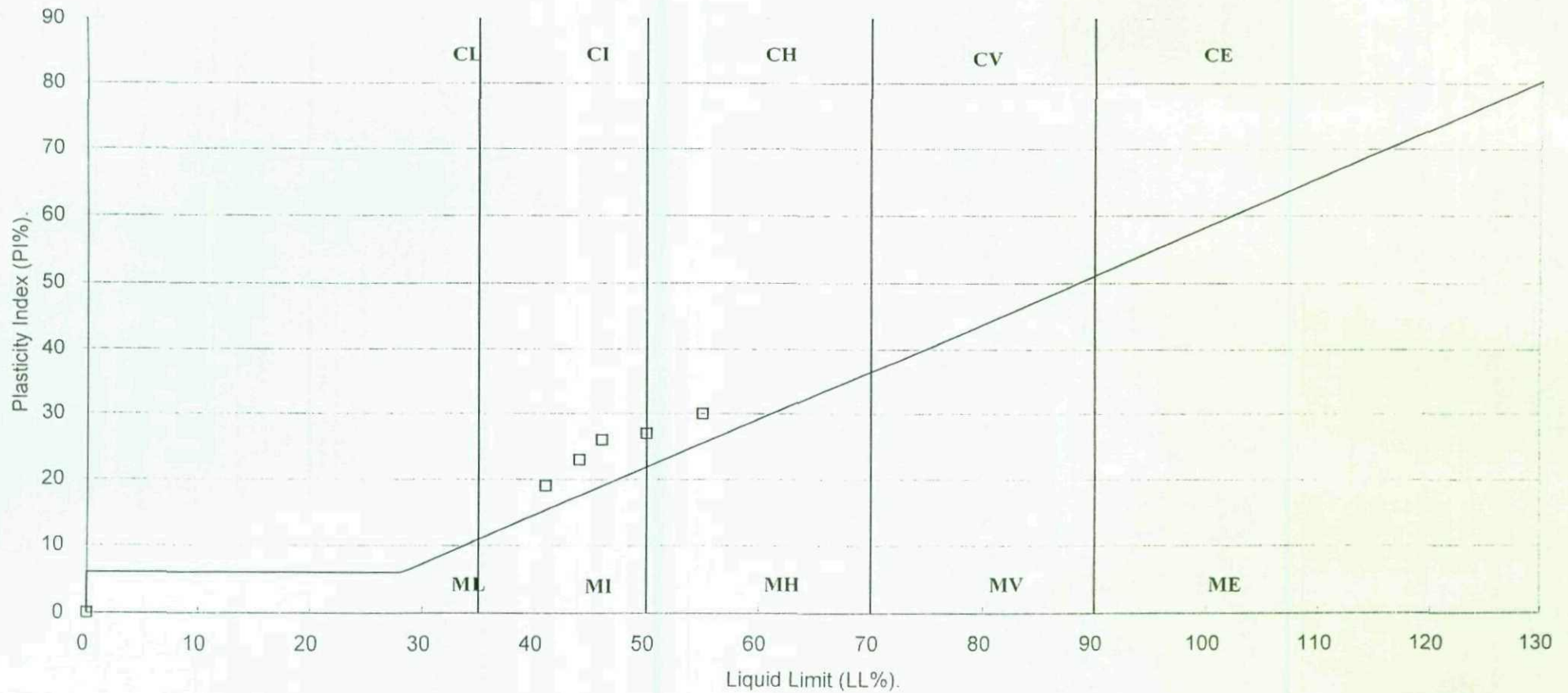
**Professional Soils Laboratory**

| Compiled by                                                                          | Date   | Checked by                                                                            | Date   | Approved by                                                                           | Date                    |
|--------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|-------------------------|
|  | 8/1/08 |  | 8/1/08 |  | 8/1/08                  |
| NORTH GAWBER.                                                                        |        |                                                                                       |        |                                                                                       | Contract No: PSL07/2904 |
|                                                                                      |        |                                                                                       |        |                                                                                       | Client Ref: 07053       |



# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



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Compiled by

*[Signature]*

Date

8/1/08

Checked by

*[Signature]*

Date

8/1/08

Approved by

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Date

8/1/08

NORTH GAWBER.

Contract No: PSL07/2904

Client Ref: 07053

## SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

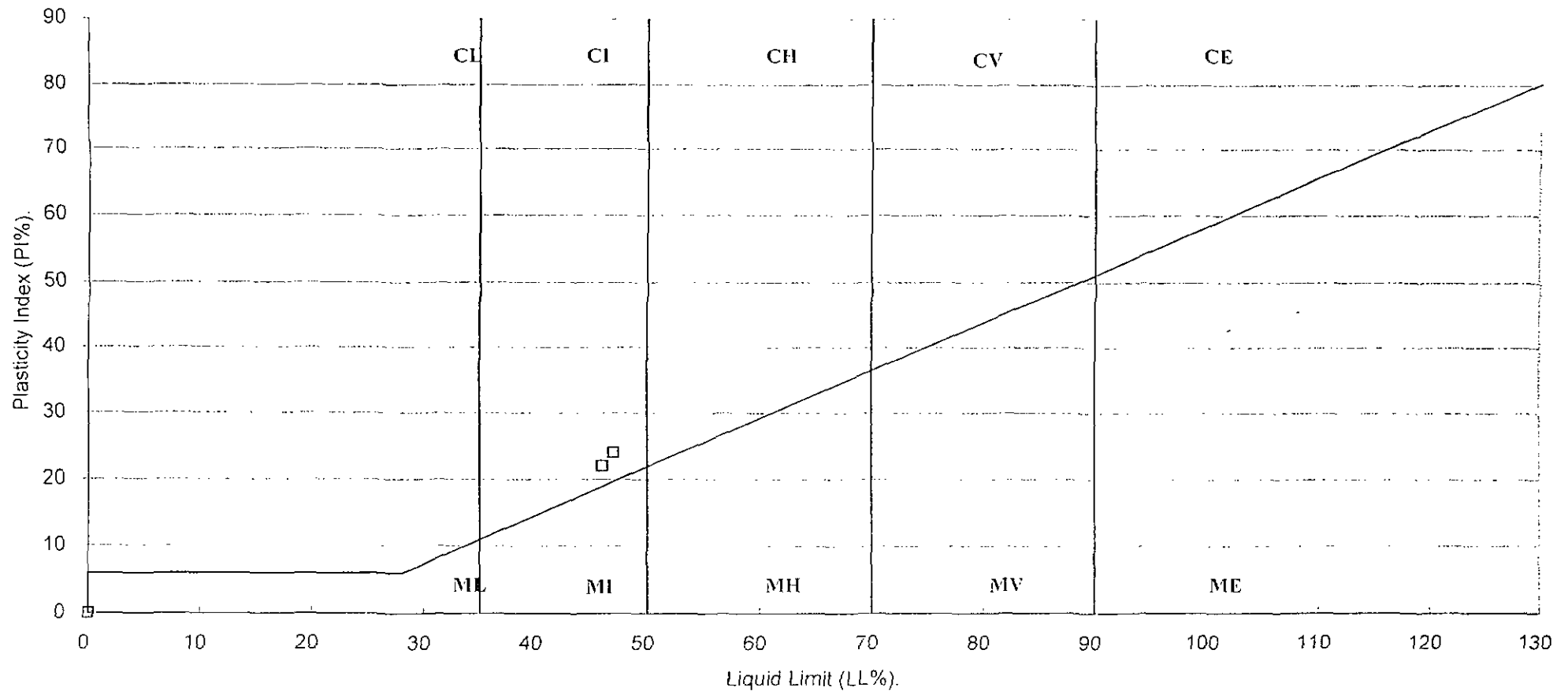
**SYMBOLS :** NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

|                                                                                     |                                                                                      |        |                                                                                       |        |                                                                                       |                                              |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|----------------------------------------------|
|  | Compiled by                                                                          | Date   | Checked by                                                                            | Date   | Approved by                                                                           | Date                                         |
|                                                                                     |  | 8/1/08 |  | 8/1/08 |  | 8/1/08                                       |
|                                                                                     | NORTH GAWBER.                                                                        |        |                                                                                       |        |                                                                                       | Contract No: PSL07/290-<br>Client Ref: 07053 |

# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



**PSL**

**Professional Soils Laboratory**

| Compiled by        | Date   | Checked by         | Date   | Approved by        | Date                    |
|--------------------|--------|--------------------|--------|--------------------|-------------------------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08                  |
| NORTH GAWBER.      |        |                    |        |                    | Contract No: PSL07/2904 |
|                    |        |                    |        |                    | Client Ref: 07053       |



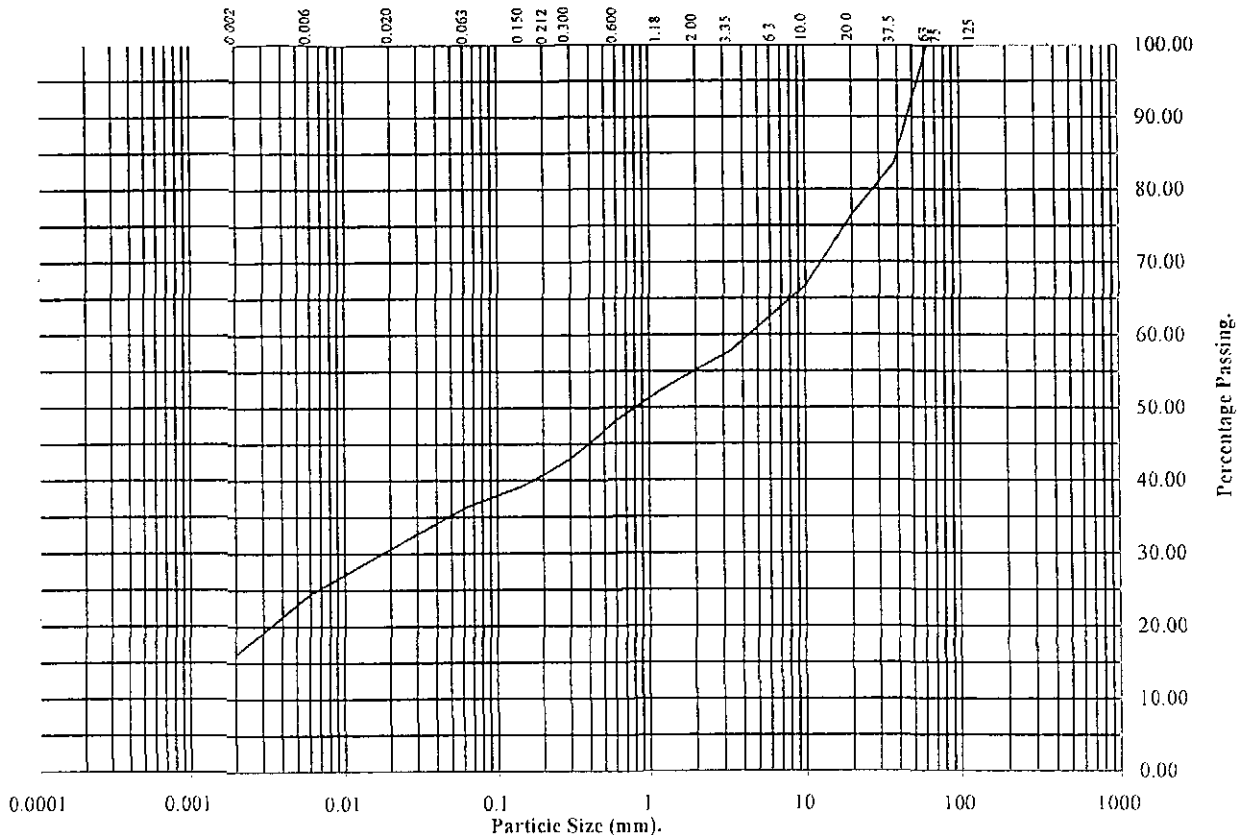
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP2

Depth (m): 1.80



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 84                 |
| 20            | 77                 |
| 10            | 67                 |
| 6.3           | 63                 |
| 3.35          | 58                 |
| 2             | 55                 |
| 1.18          | 52                 |
| 0.6           | 48                 |
| 0.3           | 43                 |
| 0.212         | 41                 |
| 0.15          | 39                 |
| 0.063         | 36                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 31                 |
| 0.006             | 24                 |
| 0.002             | 16                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 45               |
| Sand          | 19               |
| Silt          | 20               |
| Clay          | 16               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 6/12/07 | <i>[Signature]</i> | 6/12/07 |

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NORTH GAWBER COLLIERY.

Contract No.:

PSL07/2659

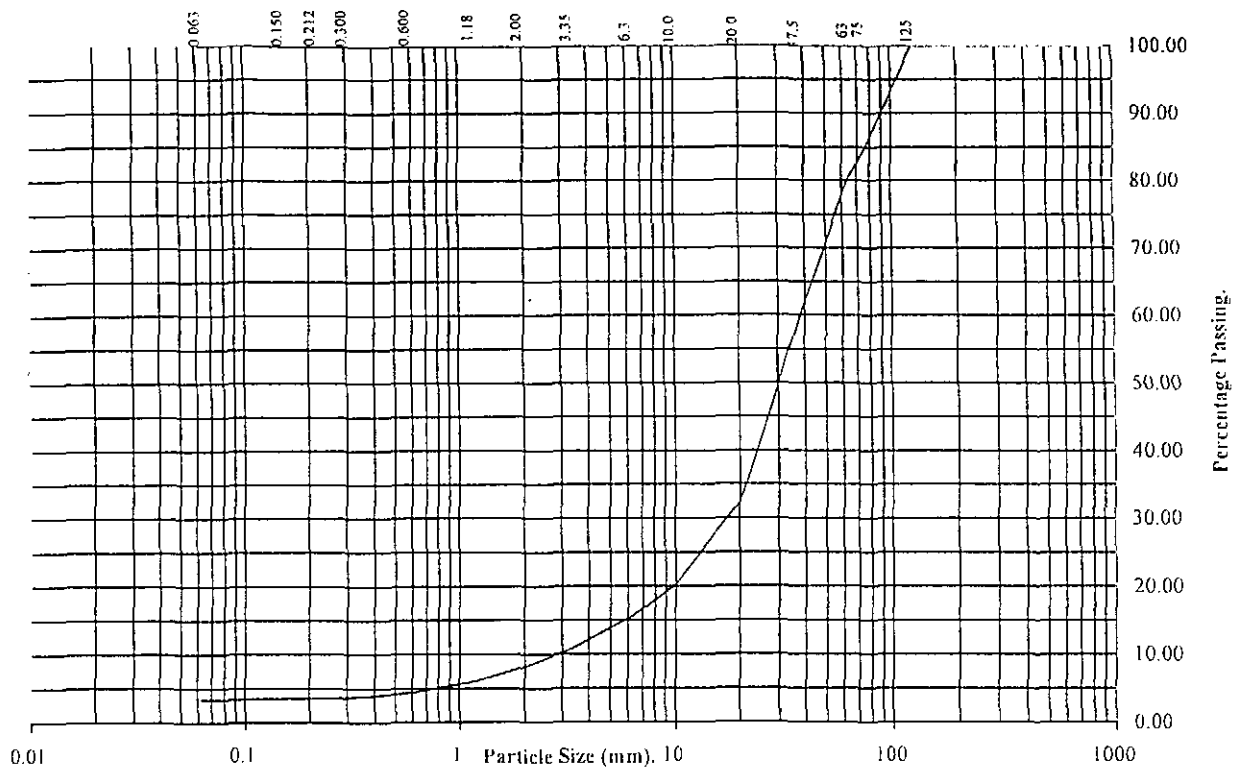
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: TP2

Depth (m): 3.20



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 85                 |
| 63            | 80                 |
| 37.5          | 60                 |
| 20            | 32                 |
| 10            | 20                 |
| 6.3           | 16                 |
| 3.35          | 11                 |
| 2             | 8                  |
| 1.18          | 6                  |
| 0.6           | 4                  |
| 0.3           | 4                  |
| 0.212         | 4                  |
| 0.15          | 3                  |
| 0.063         | 3                  |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 20               |
| Gravel        | 72               |
| Sand          | 5                |
| Silt/Clay     | 3                |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

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Contract No.:

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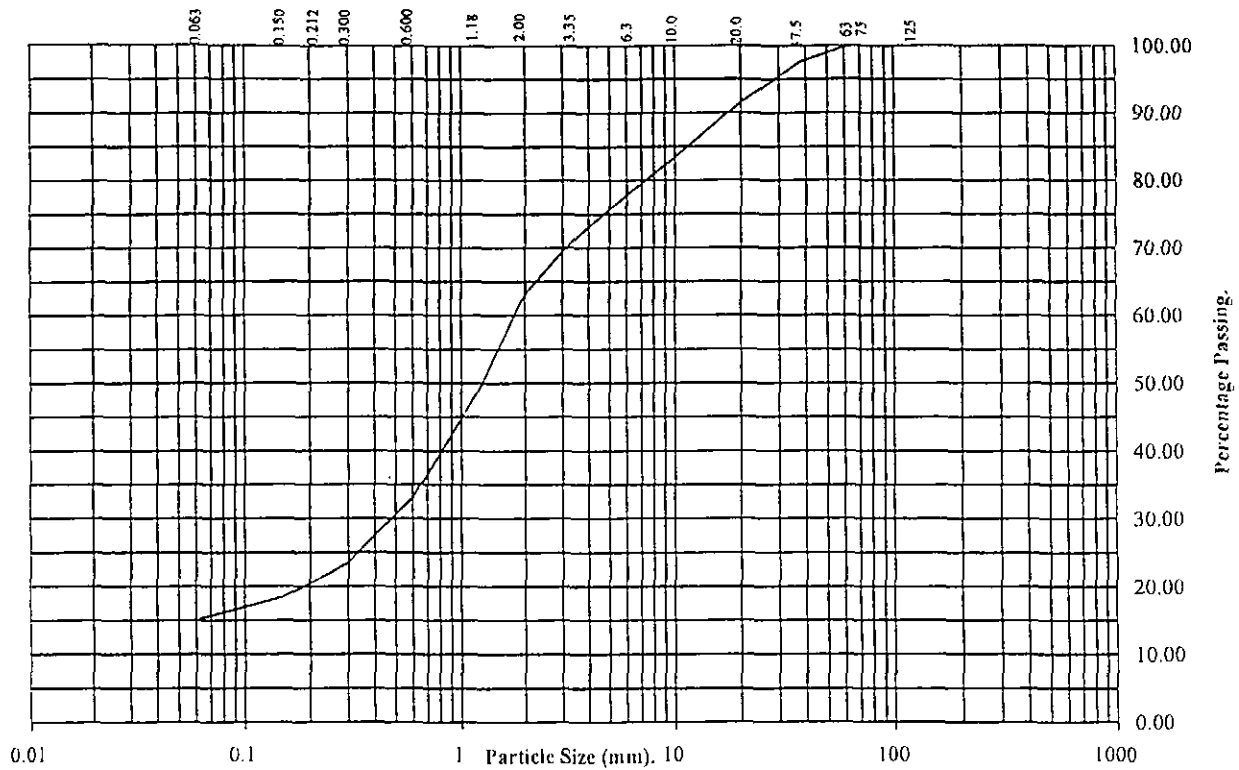
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: TP6

Depth (m): 0.70



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 98                 |
| 20            | 92                 |
| 10            | 83                 |
| 6.3           | 78                 |
| 3.35          | 71                 |
| 2             | 63                 |
| 1.18          | 49                 |
| 0.6           | 33                 |
| 0.3           | 24                 |
| 0.212         | 21                 |
| 0.15          | 18                 |
| 0.063         | 15                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 37               |
| Sand          | 48               |
| Silt/Clay     | 15               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 11/12/14 | <i>[Signature]</i> | 11/12/14 |

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Contract No.:

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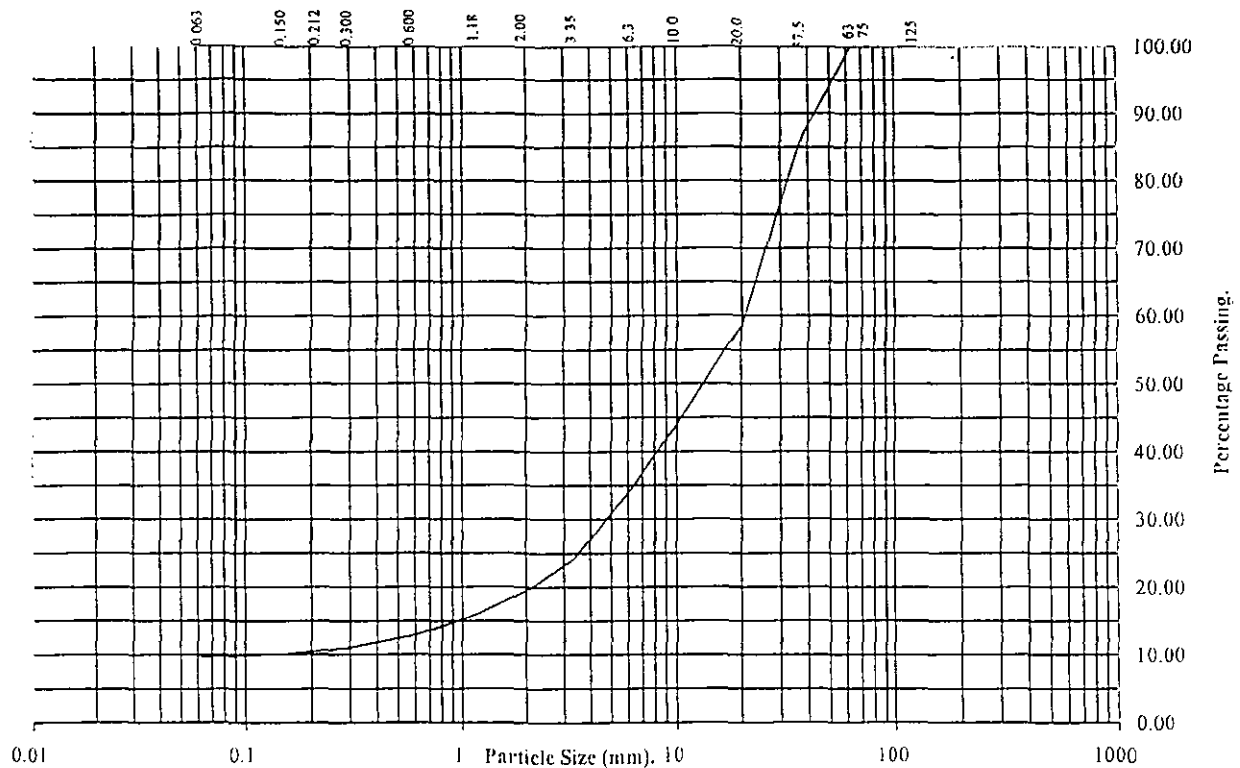
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: TP7

Depth (m): 1.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 87                 |
| 20            | 59                 |
| 10            | 44                 |
| 6.3           | 35                 |
| 3.35          | 24                 |
| 2             | 19                 |
| 1.18          | 16                 |
| 0.6           | 13                 |
| 0.3           | 11                 |
| 0.212         | 11                 |
| 0.15          | 10                 |
| 0.063         | 10                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 81               |
| Sand          | 9                |
| Silt/Clay     | 10               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

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Contract No.:

PSL07/2659

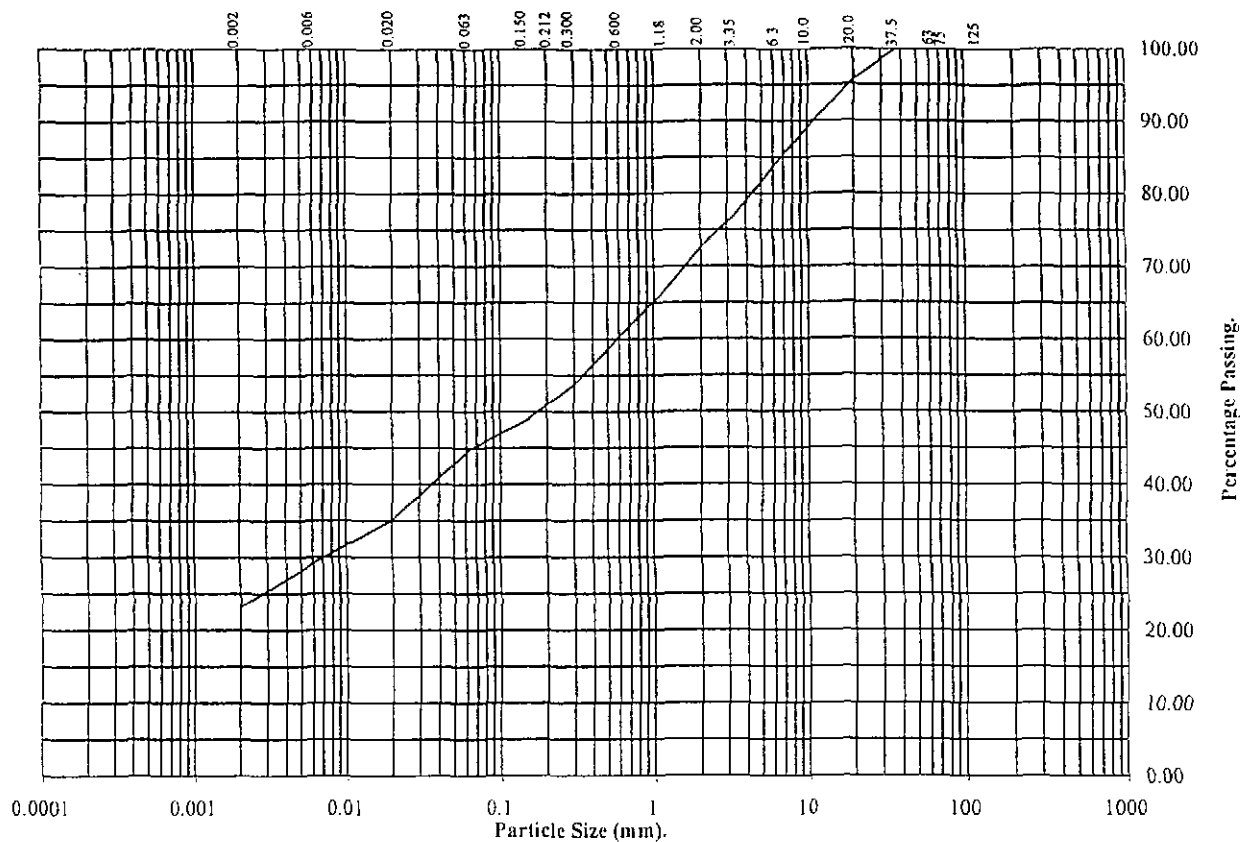
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP8

Depth (m): 1.80



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 100                |
| 20            | 96                 |
| 10            | 89                 |
| 6.3           | 84                 |
| 3.35          | 77                 |
| 2             | 73                 |
| 1.18          | 67                 |
| 0.6           | 60                 |
| 0.3           | 54                 |
| 0.212         | 51                 |
| 0.15          | 49                 |
| 0.063         | 45                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 35                 |
| 0.006             | 29                 |
| 0.002             | 23                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 27               |
| Sand          | 28               |
| Silt          | 22               |
| Clay          | 23               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 11/12/15 | <i>[Signature]</i> | 11/12/15 |

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Contract No.:

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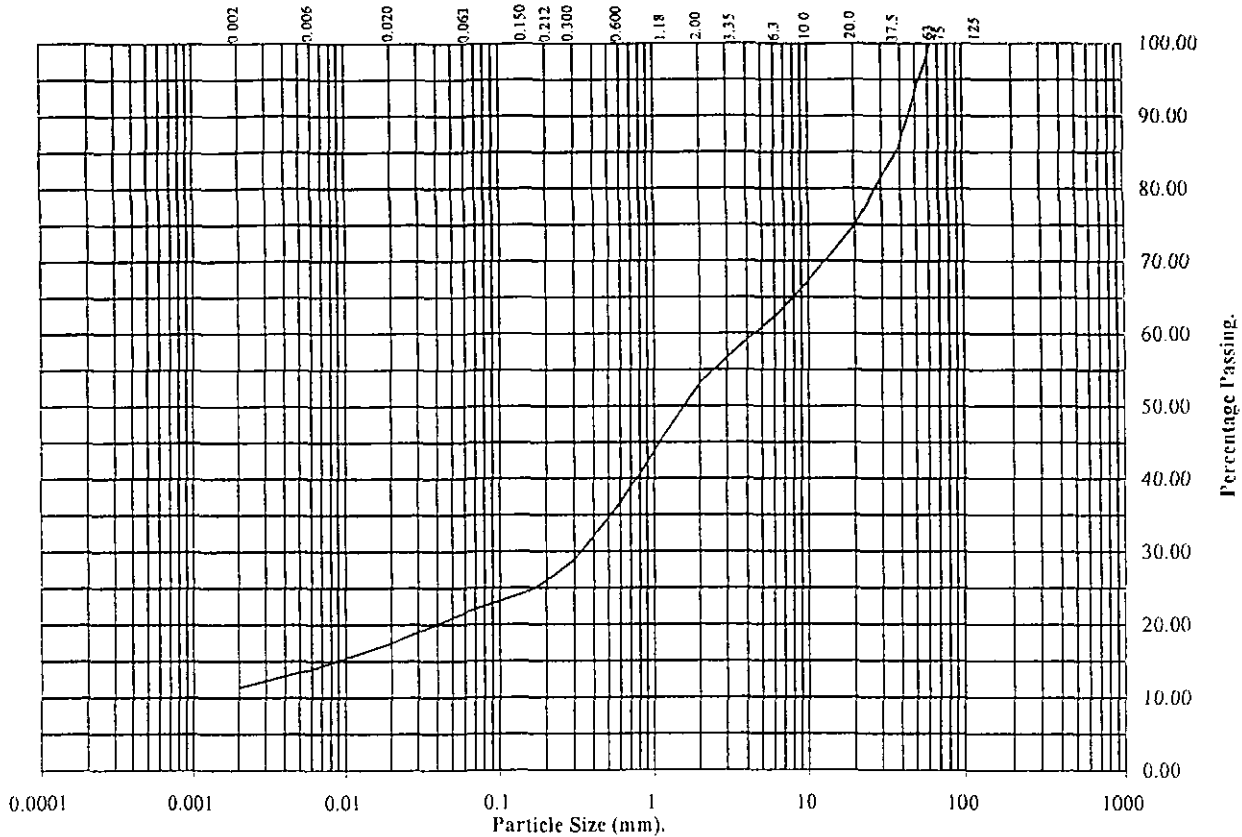
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP13

Depth (m): 2.20



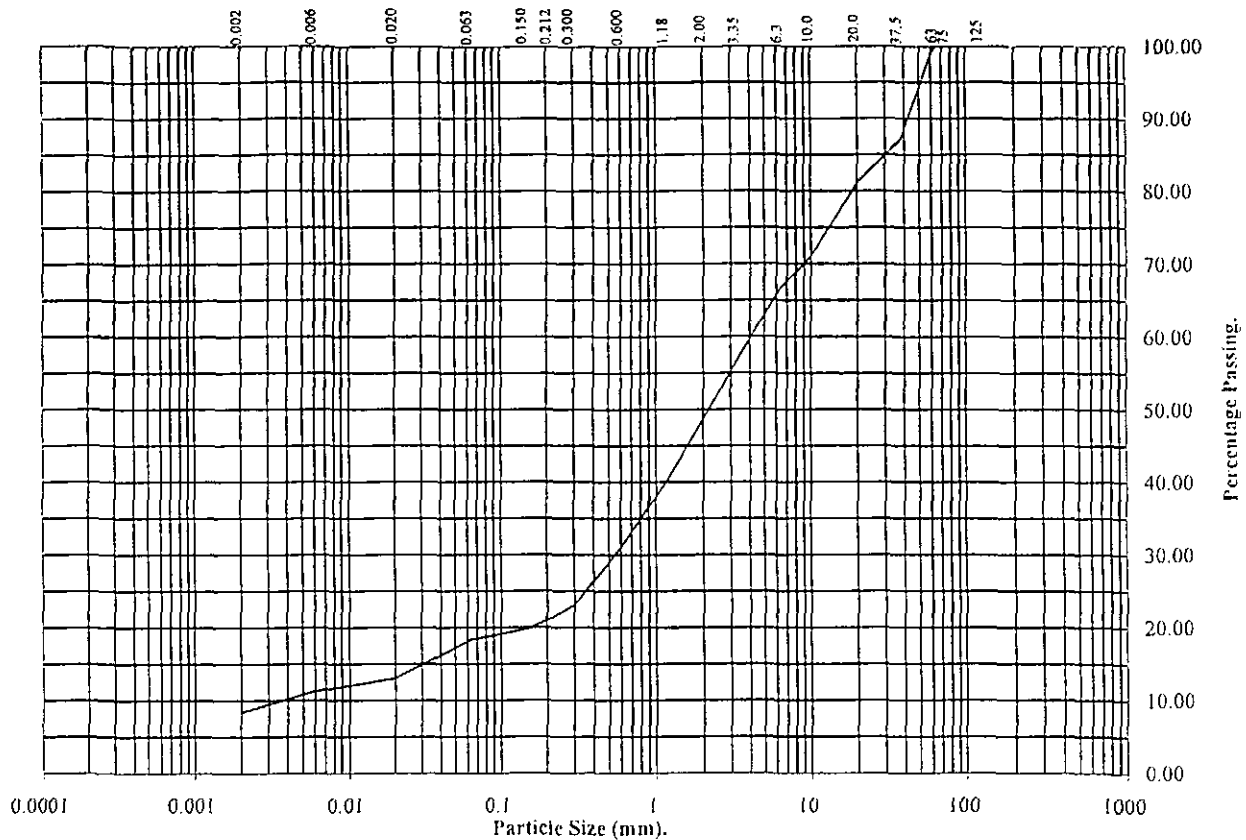
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP20

Depth (m): 2.50



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 87                 |
| 20            | 81                 |
| 10            | 71                 |
| 6.3           | 67                 |
| 3.35          | 57                 |
| 2             | 49                 |
| 1.18          | 40                 |
| 0.6           | 31                 |
| 0.3           | 23                 |
| 0.212         | 21                 |
| 0.15          | 20                 |
| 0.063         | 18                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 13                 |
| 0.006             | 11                 |
| 0.002             | 8                  |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 51               |
| Sand          | 31               |
| Silt          | 10               |
| Clay          | 8                |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 11/12/15 | <i>[Signature]</i> | 11/12/15 |

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Contract No.:

PSL07/2659





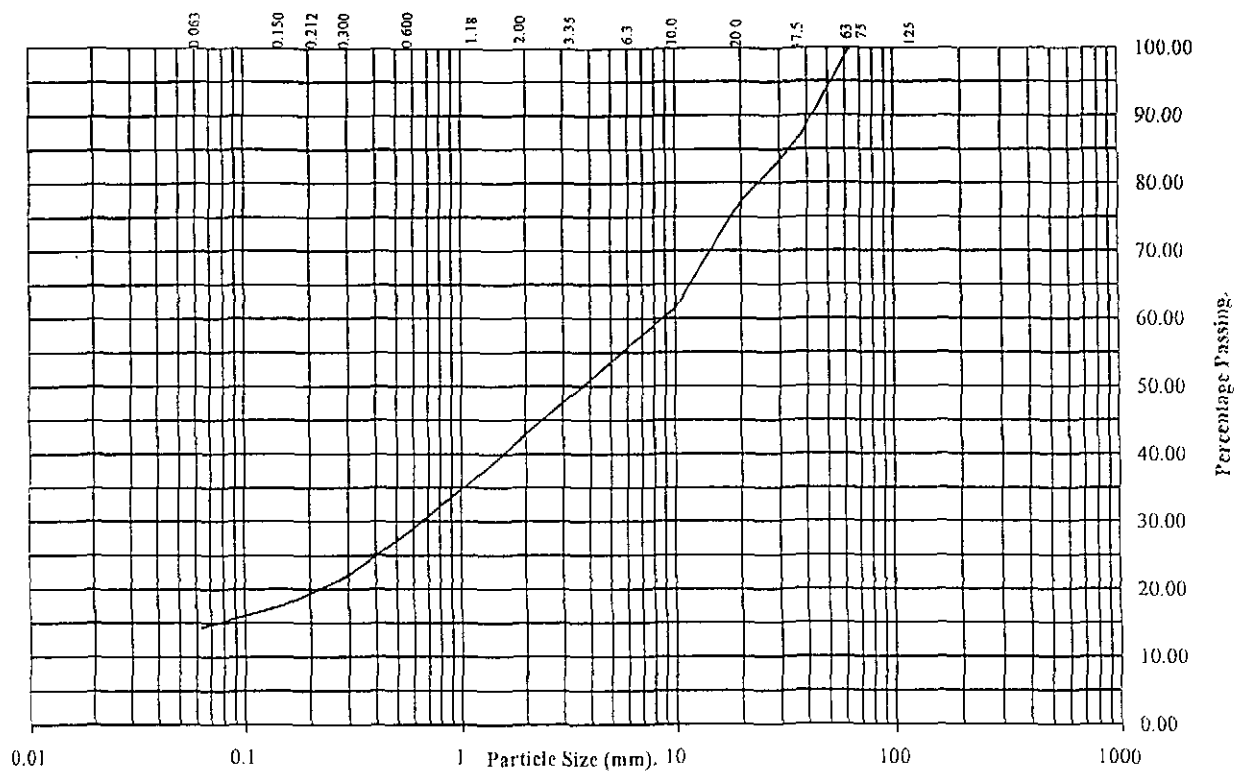
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: TP25

Depth (m): 1.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 87                 |
| 20            | 77                 |
| 10            | 62                 |
| 6.3           | 56                 |
| 3.35          | 49                 |
| 2             | 43                 |
| 1.18          | 37                 |
| 0.6           | 29                 |
| 0.3           | 22                 |
| 0.212         | 20                 |
| 0.15          | 18                 |
| 0.063         | 14                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 57               |
| Sand          | 29               |
| Silt/Clay     | 14               |

**Remarks:**

See summary of soil descriptions.

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 11/11/15 | <i>[Signature]</i> | 11/11/15 |

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Contract No.:

PSL07/2659

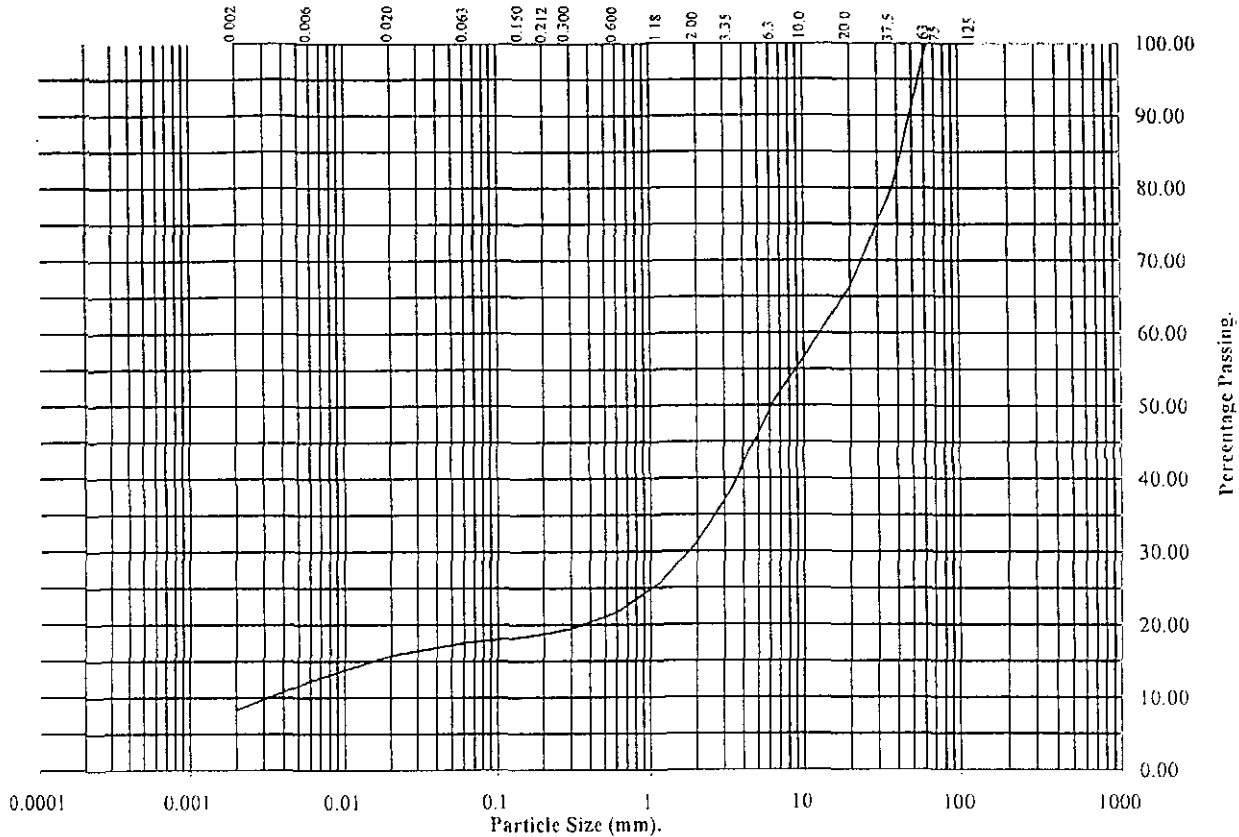
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP26

Depth (m): 0.50



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 80                 |
| 20            | 66                 |
| 10            | 57                 |
| 6.3           | 51                 |
| 3.35          | 39                 |
| 2             | 31                 |
| 1.18          | 26                 |
| 0.6           | 22                 |
| 0.3           | 19                 |
| 0.212         | 19                 |
| 0.15          | 18                 |
| 0.063         | 18                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 16                 |
| 0.006             | 12                 |
| 0.002             | 8                  |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 69               |
| Sand          | 13               |
| Silt          | 10               |
| Clay          | 8                |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

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NORTH GAWBER COLLIERY.

Contract No.:

PSL07/2659

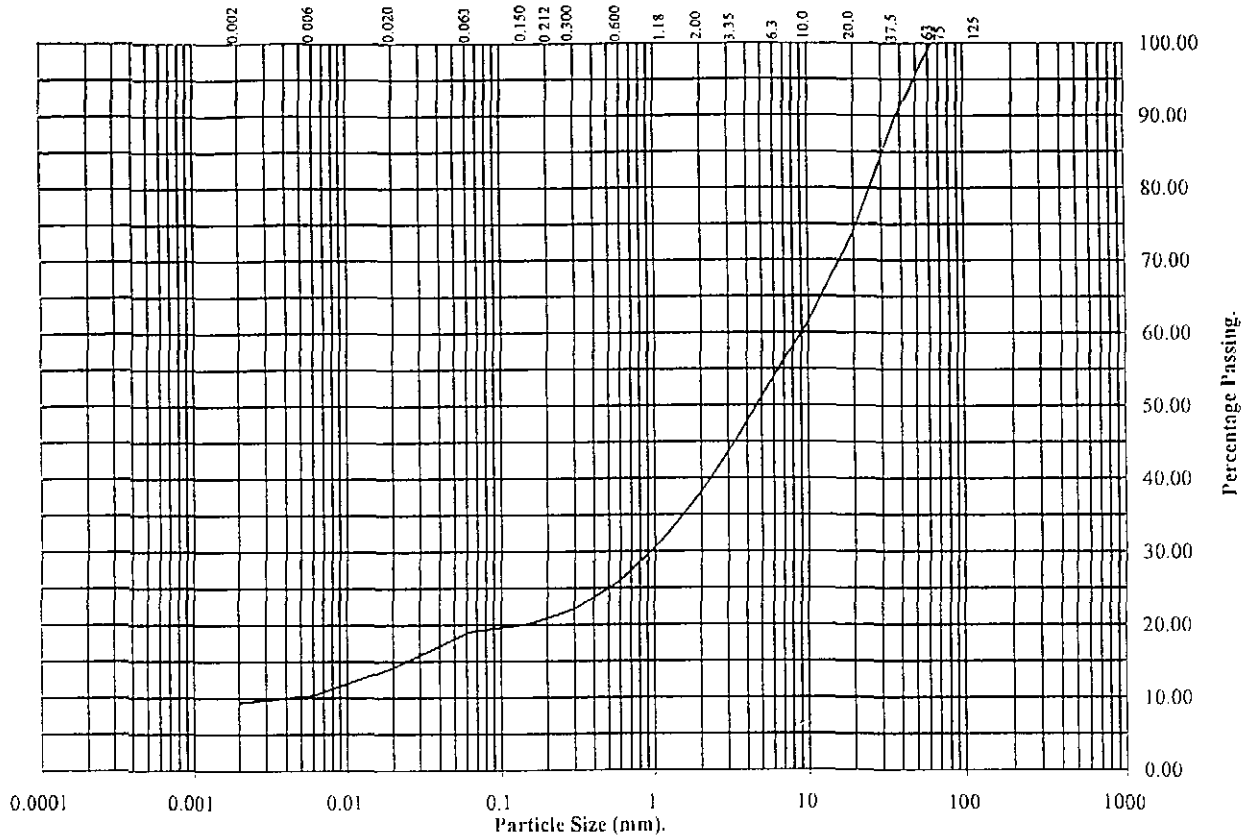
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP32

Depth (m): 0.50



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 90                 |
| 20            | 74                 |
| 10            | 62                 |
| 6.3           | 55                 |
| 3.35          | 45                 |
| 2             | 38                 |
| 1.18          | 32                 |
| 0.6           | 26                 |
| 0.3           | 22                 |
| 0.212         | 21                 |
| 0.15          | 20                 |
| 0.063         | 19                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 14                 |
| 0.006             | 10                 |
| 0.002             | 9                  |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 62               |
| Sand          | 19               |
| Silt          | 10               |
| Clay          | 9                |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 12/12/12 | <i>[Signature]</i> | 12/12/12 |

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Contract No.:

PSL07/2659

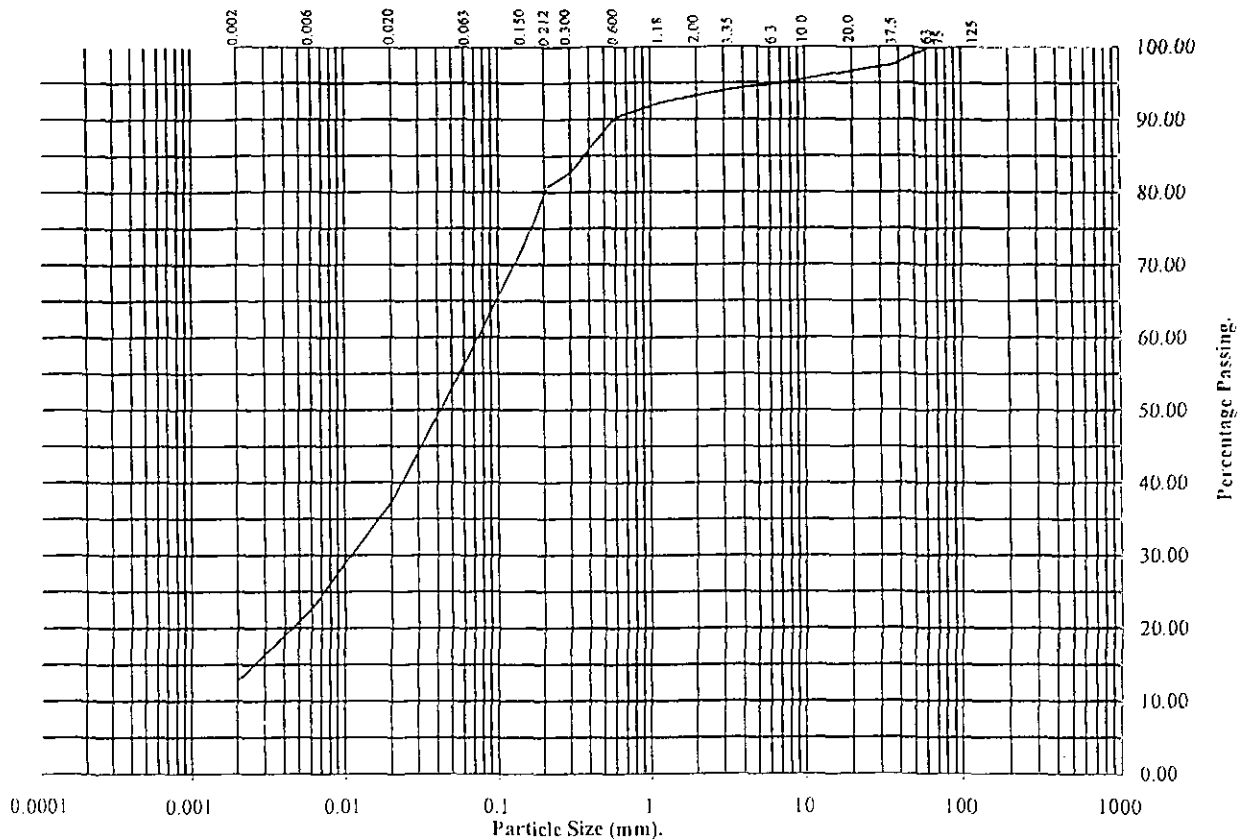
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP37

Depth (m): 2.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 98                 |
| 20            | 97                 |
| 10            | 96                 |
| 6.3           | 95                 |
| 3.35          | 94                 |
| 2             | 93                 |
| 1.18          | 92                 |
| 0.6           | 90                 |
| 0.3           | 83                 |
| 0.212         | 81                 |
| 0.15          | 73                 |
| 0.063         | 57                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 37                 |
| 0.006             | 23                 |
| 0.002             | 13                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 7                |
| Sand          | 36               |
| Silt          | 44               |
| Clay          | 13               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 6/12/07 | <i>[Signature]</i> | 6/12/07 |

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NORTH GAWBER COLLIERY.

Contract No.:

PSL07/2659

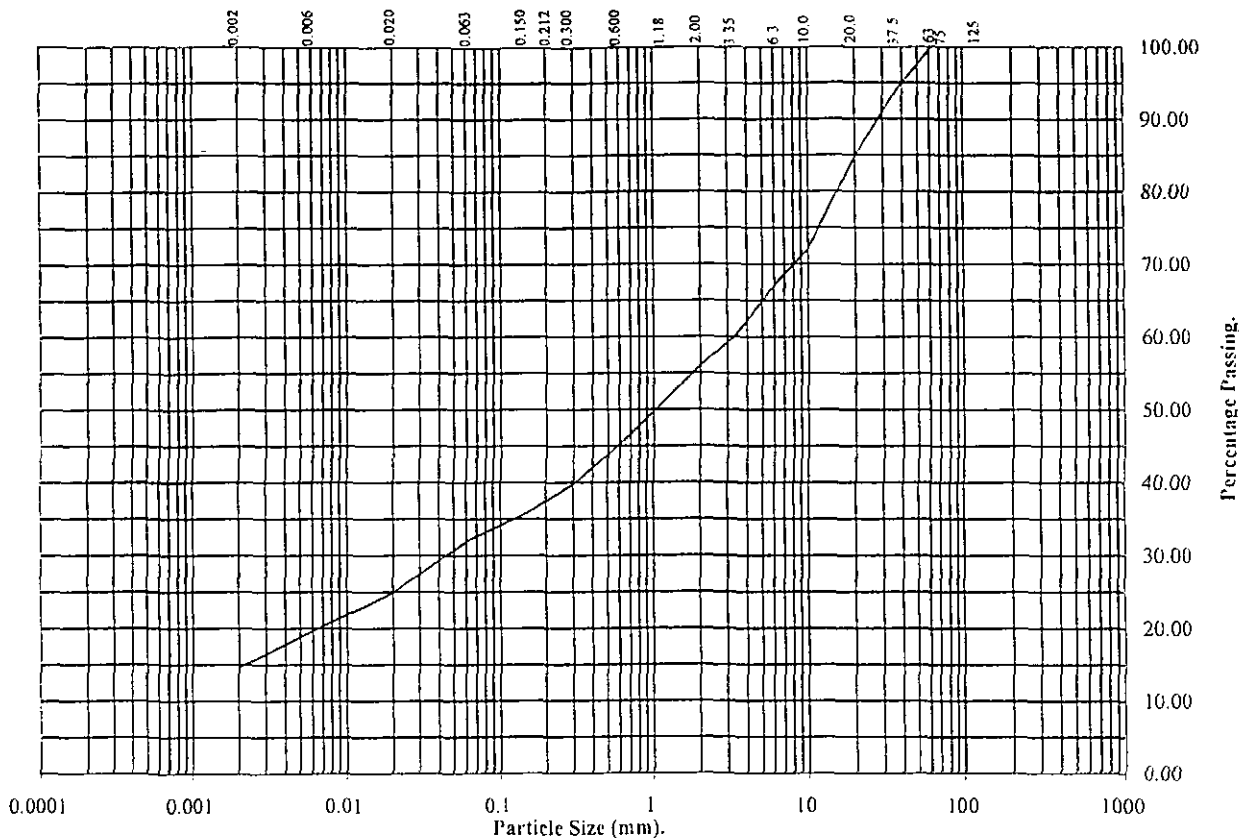
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP46

Depth (m): 1.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 94                 |
| 20            | 85                 |
| 10            | 72                 |
| 6.3           | 68                 |
| 3.35          | 60                 |
| 2             | 56                 |
| 1.18          | 51                 |
| 0.6           | 45                 |
| 0.3           | 40                 |
| 0.212         | 38                 |
| 0.15          | 36                 |
| 0.063         | 32                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 25                 |
| 0.006             | 20                 |
| 0.002             | 15                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 44               |
| Sand          | 24               |
| Silt          | 17               |
| Clay          | 15               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 12/12/15 | <i>[Signature]</i> | 12/12/15 |

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Contract No.:  
PSL07/2659

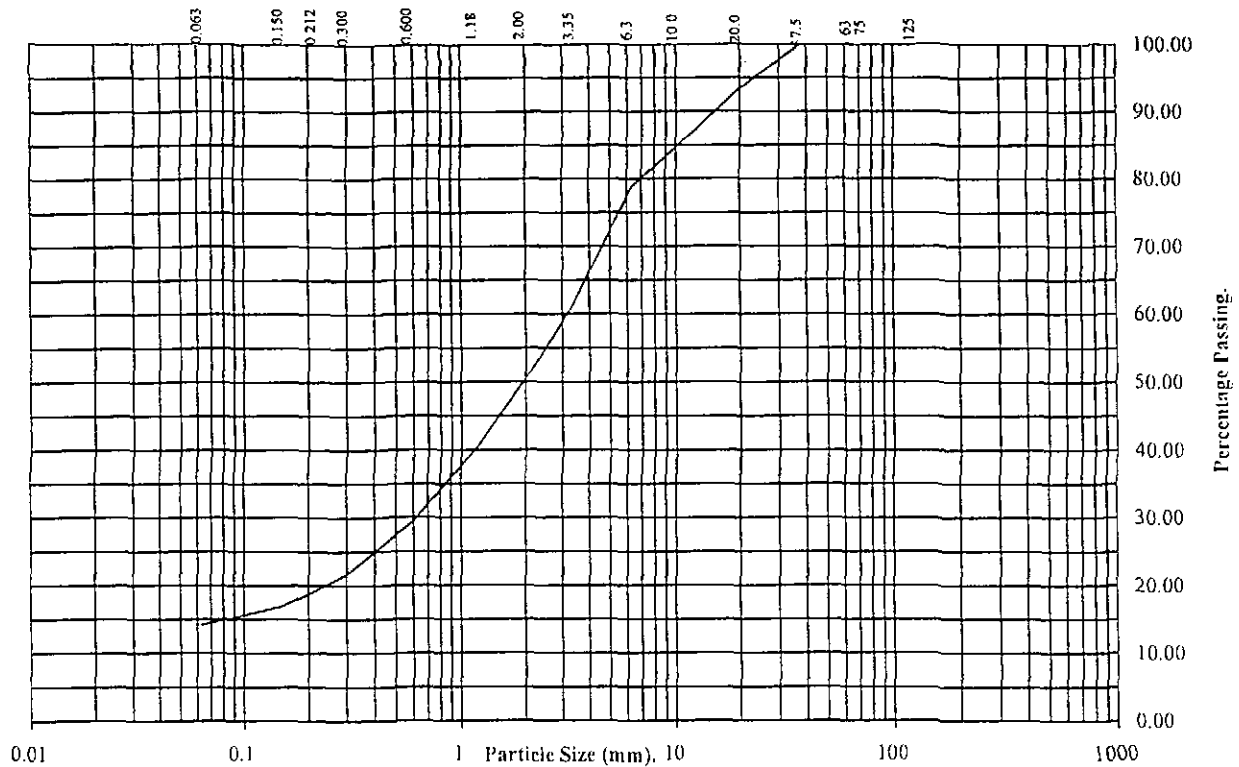
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: TP51

Depth (m): 2.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 100                |
| 20            | 93                 |
| 10            | 85                 |
| 6.3           | 79                 |
| 3.35          | 61                 |
| 2             | 50                 |
| 1.18          | 40                 |
| 0.6           | 29                 |
| 0.3           | 22                 |
| 0.212         | 19                 |
| 0.15          | 17                 |
| 0.063         | 14                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 50               |
| Sand          | 36               |
| Silt/Clay     | 14               |

## Remarks:

See summary of soil descriptions.

| Checked By | Date     | Approved By | Date     |
|------------|----------|-------------|----------|
|            | 12/12/15 |             | 12/12/15 |

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Contract No.:

PSL07/2659

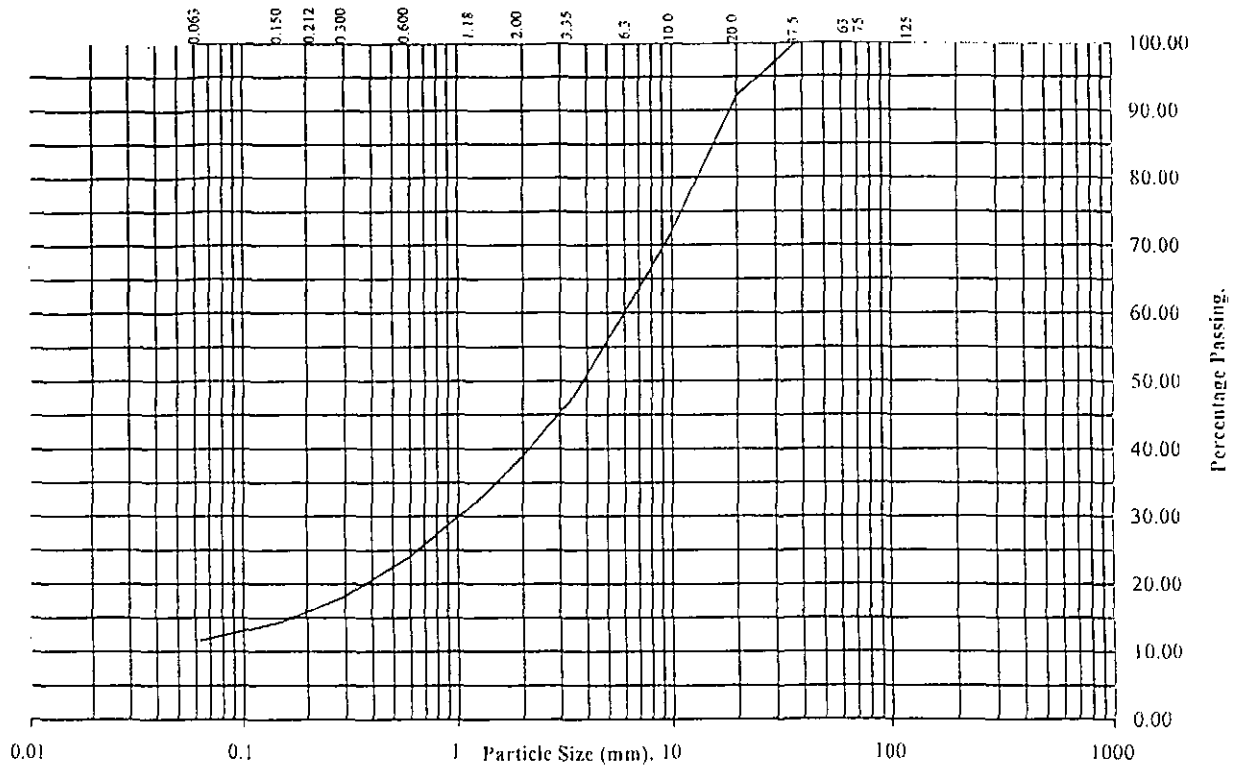
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Trial Pit /Sample Number: TP54

Depth (m): 2.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 100                |
| 20            | 92                 |
| 10            | 72                 |
| 6.3           | 61                 |
| 3.35          | 47                 |
| 2             | 39                 |
| 1.18          | 32                 |
| 0.6           | 24                 |
| 0.3           | 18                 |
| 0.212         | 16                 |
| 0.15          | 14                 |
| 0.063         | 12                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 61               |
| Sand          | 27               |
| Silt/Clay     | 12               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

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Professional Soils Laboratory

NORTH GAWBER COLLIERY.

Contract No.:

PSL07/2659

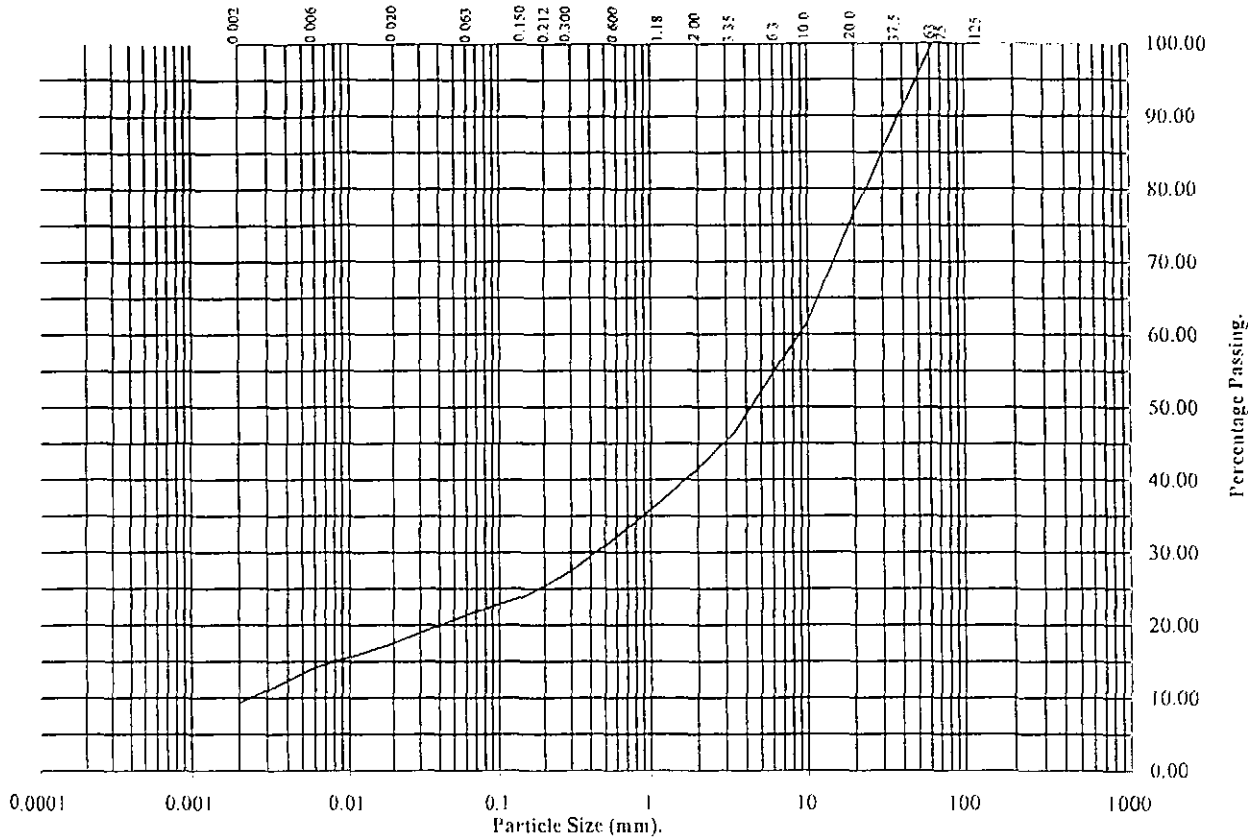
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP63

Depth (m): 2.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 90                 |
| 20            | 77                 |
| 10            | 62                 |
| 6.3           | 56                 |
| 3.35          | 46                 |
| 2             | 42                 |
| 1.18          | 37                 |
| 0.6           | 32                 |
| 0.3           | 27                 |
| 0.212         | 26                 |
| 0.15          | 24                 |
| 0.063         | 22                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 18                 |
| 0.006             | 14                 |
| 0.002             | 9                  |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 58               |
| Sand          | 20               |
| Silt          | 13               |
| Clay          | 9                |

**Remarks:**  
See summary of soil descriptions.

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

|                                             |                        |                             |
|---------------------------------------------|------------------------|-----------------------------|
| <b>PSL</b><br>Professional Soils Laboratory | NORTH GAWBER COLLIERY. | Contract No.:<br>PSL07/2659 |
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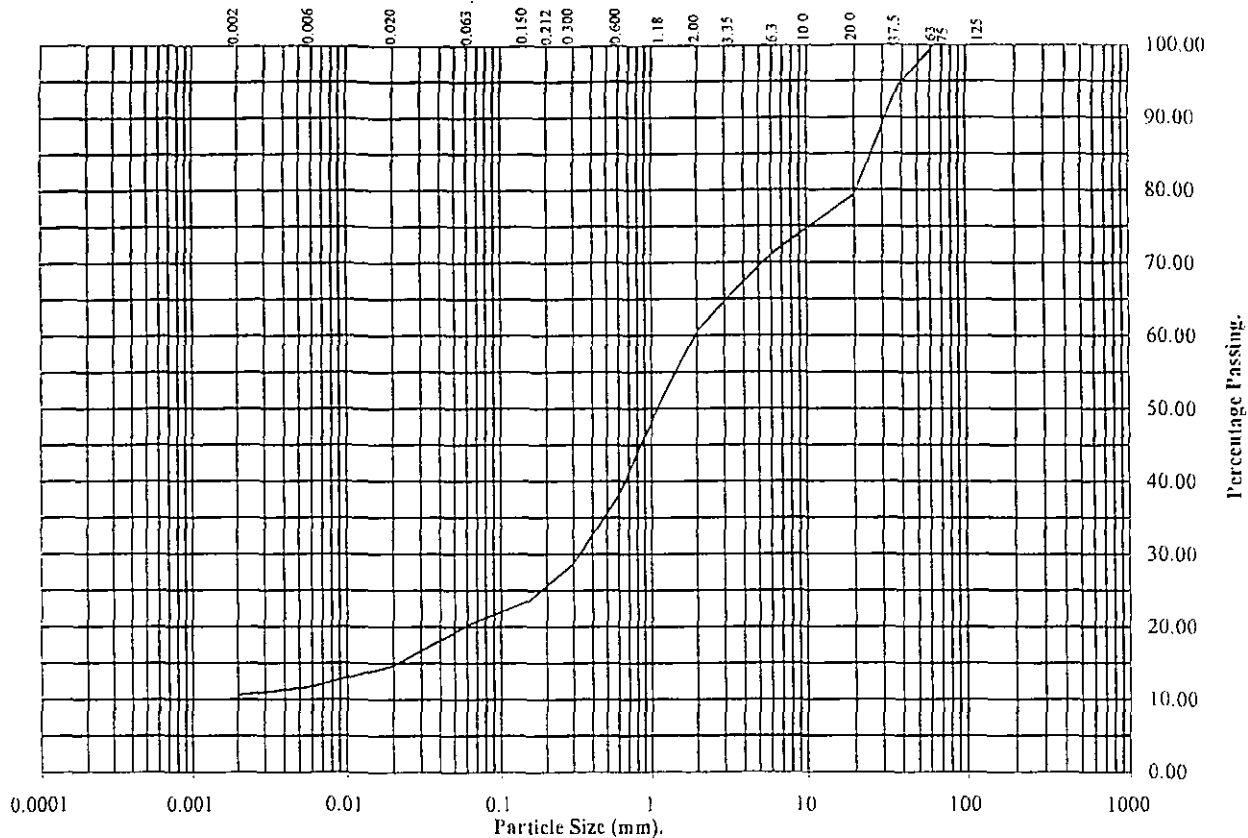
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Trial Pit /Sample Number: TP67

Depth (m): 1.50



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 94                 |
| 20            | 79                 |
| 10            | 75                 |
| 6.3           | 72                 |
| 3.35          | 66                 |
| 2             | 61                 |
| 1.18          | 52                 |
| 0.6           | 38                 |
| 0.3           | 29                 |
| 0.212         | 26                 |
| 0.15          | 24                 |
| 0.063         | 20                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 15                 |
| 0.006             | 12                 |
| 0.002             | 11                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 39               |
| Sand          | 41               |
| Silt          | 9                |
| Clay          | 11               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 12/12/14 | <i>[Signature]</i> | 12/12/14 |

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Contract No.:  
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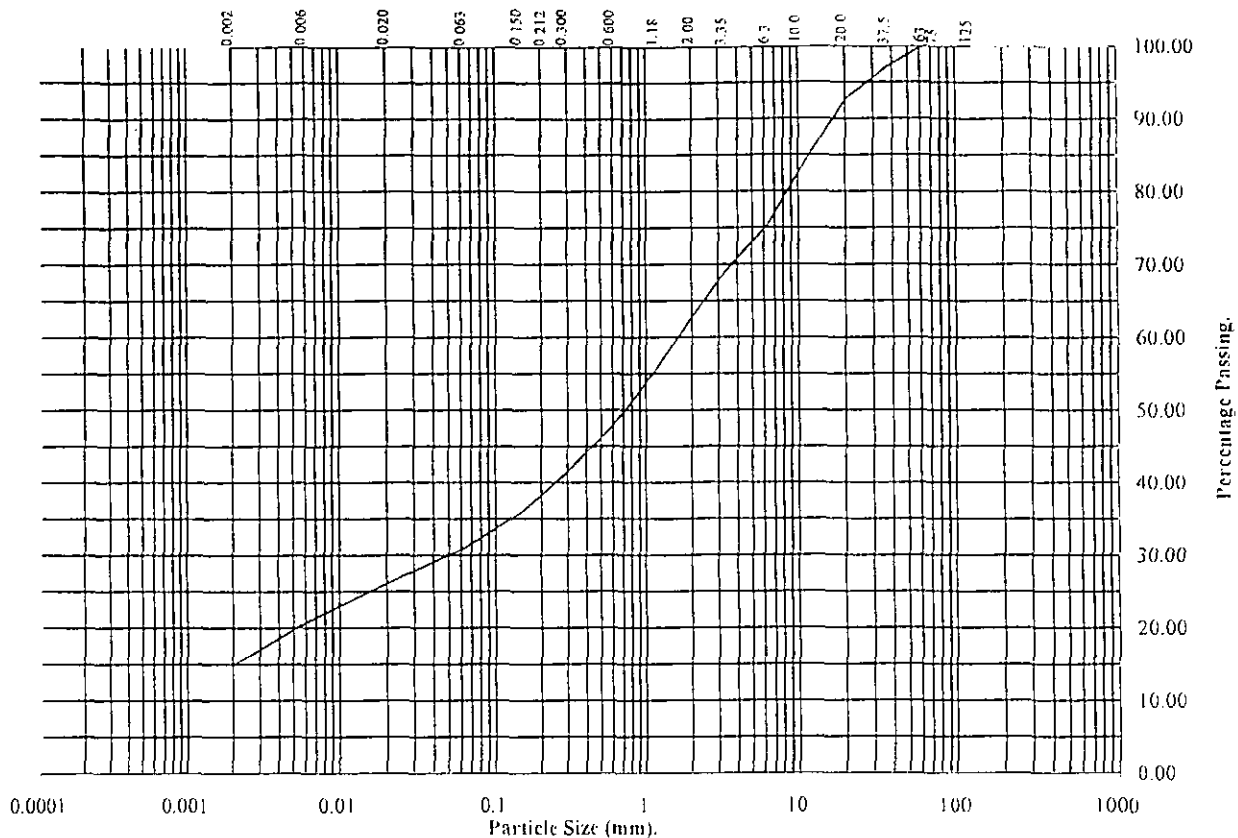
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Borehole/Sample Number: BH101

Depth (m): 1.50-2.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 97                 |
| 20            | 93                 |
| 10            | 82                 |
| 6.3           | 75                 |
| 3.35          | 69                 |
| 2             | 63                 |
| 1.18          | 56                 |
| 0.6           | 48                 |
| 0.3           | 41                 |
| 0.212         | 39                 |
| 0.15          | 36                 |
| 0.063         | 31                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 26                 |
| 0.006             | 21                 |
| 0.002             | 15                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 37               |
| Sand          | 32               |
| Silt          | 16               |
| Clay          | 15               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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Contract No.:

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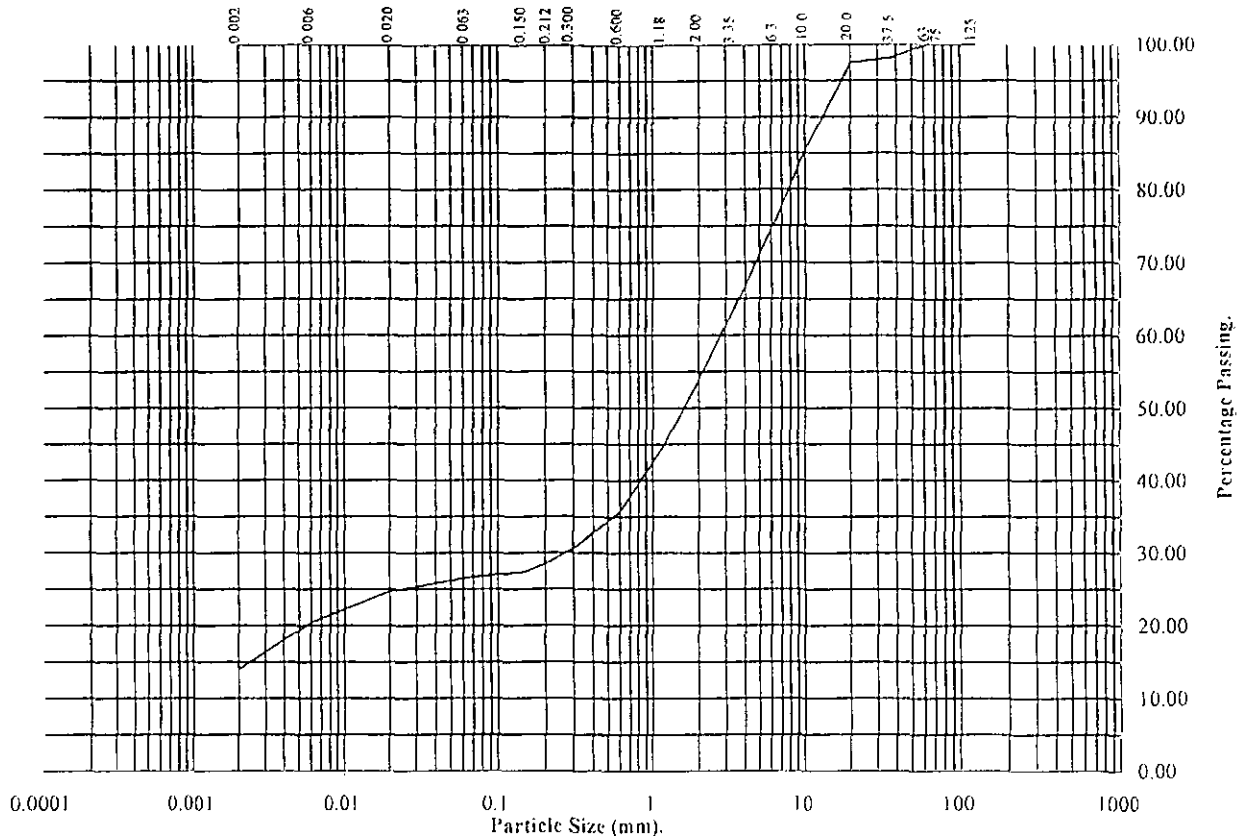
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Borehole/Sample Number: BH103

Depth (m): 5.60-7.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 98                 |
| 20            | 97                 |
| 10            | 85                 |
| 6.3           | 76                 |
| 3.35          | 63                 |
| 2             | 54                 |
| 1.18          | 45                 |
| 0.6           | 36                 |
| 0.3           | 31                 |
| 0.212         | 29                 |
| 0.15          | 27                 |
| 0.063         | 27                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 25                 |
| 0.006             | 20                 |
| 0.002             | 14                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 46               |
| Sand          | 27               |
| Silt          | 13               |
| Clay          | 14               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date   | Approved By        | Date   |
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| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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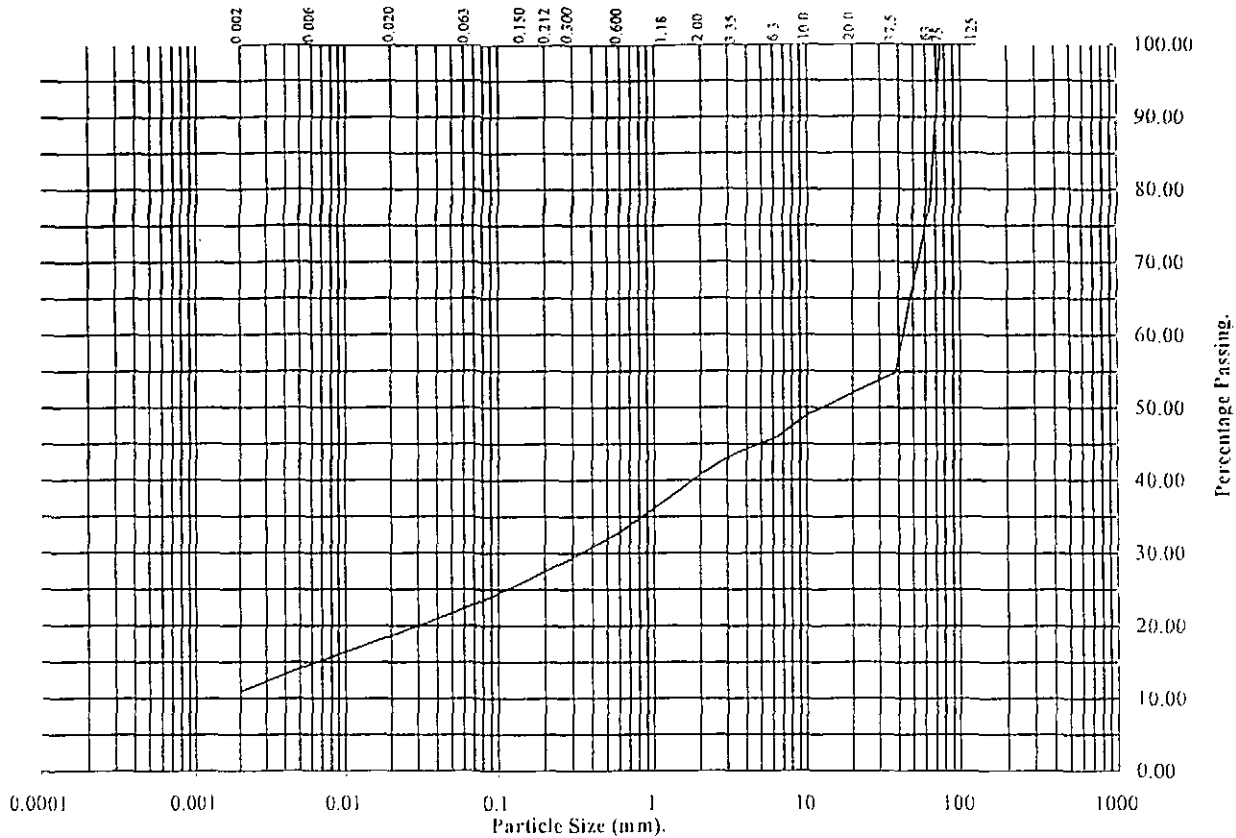
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Borehole/Sample Number: BH106

Depth (m): 4.50-6.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 77                 |
| 37.5          | 55                 |
| 20            | 52                 |
| 10            | 49                 |
| 6.3           | 46                 |
| 3.35          | 44                 |
| 2             | 41                 |
| 1.18          | 37                 |
| 0.6           | 33                 |
| 0.3           | 29                 |
| 0.212         | 28                 |
| 0.15          | 26                 |
| 0.063         | 23                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 19                 |
| 0.006             | 15                 |
| 0.002             | 11                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 23               |
| Gravel        | 36               |
| Sand          | 18               |
| Silt          | 12               |
| Clay          | 11               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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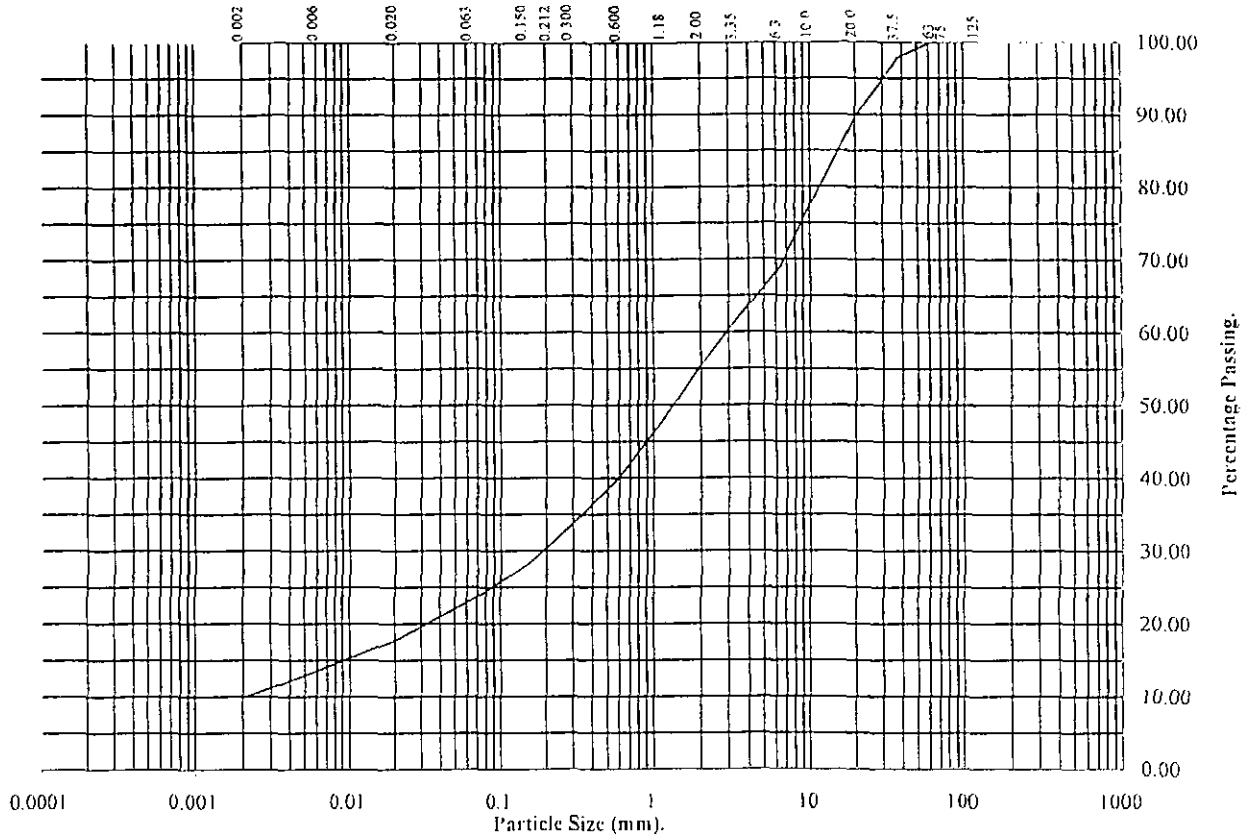
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Borehole/Sample Number: BH113

Depth (m): 1.50-3.00



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 98                 |
| 20            | 90                 |
| 10            | 77                 |
| 6.3           | 69                 |
| 3.35          | 62                 |
| 2             | 56                 |
| 1.18          | 48                 |
| 0.6           | 40                 |
| 0.3           | 34                 |
| 0.212         | 31                 |
| 0.15          | 28                 |
| 0.063         | 23                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 18                 |
| 0.006             | 14                 |
| 0.002             | 10                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 44               |
| Sand          | 33               |
| Silt          | 13               |
| Clay          | 10               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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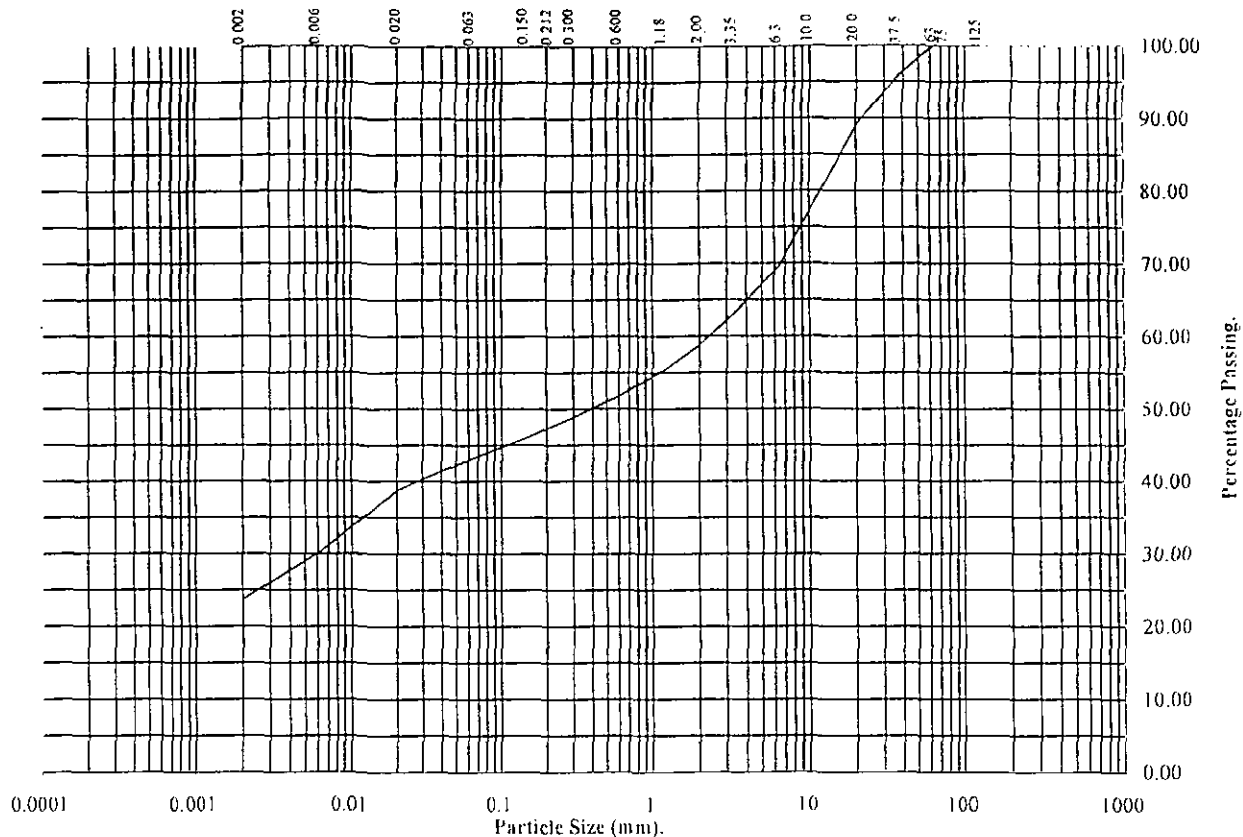
# PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990.

Wet sieve and Pipette Analysis: Clause 9.2 9.4

Borehole/Sample Number: BH118

Depth (m): 0.00-1.50



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125           | 100                |
| 75            | 100                |
| 63            | 100                |
| 37.5          | 96                 |
| 20            | 89                 |
| 10            | 77                 |
| 6.3           | 69                 |
| 3.35          | 63                 |
| 2             | 59                 |
| 1.18          | 55                 |
| 0.6           | 52                 |
| 0.3           | 49                 |
| 0.212         | 48                 |
| 0.15          | 46                 |
| 0.063         | 43                 |

| Particle Diameter | Percentage Passing |
|-------------------|--------------------|
| 0.02              | 39                 |
| 0.006             | 30                 |
| 0.002             | 24                 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles       | 0                |
| Gravel        | 41               |
| Sand          | 16               |
| Silt          | 19               |
| Clay          | 24               |

## Remarks:

See summary of soil descriptions.

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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# California Bearing Ratio Test.

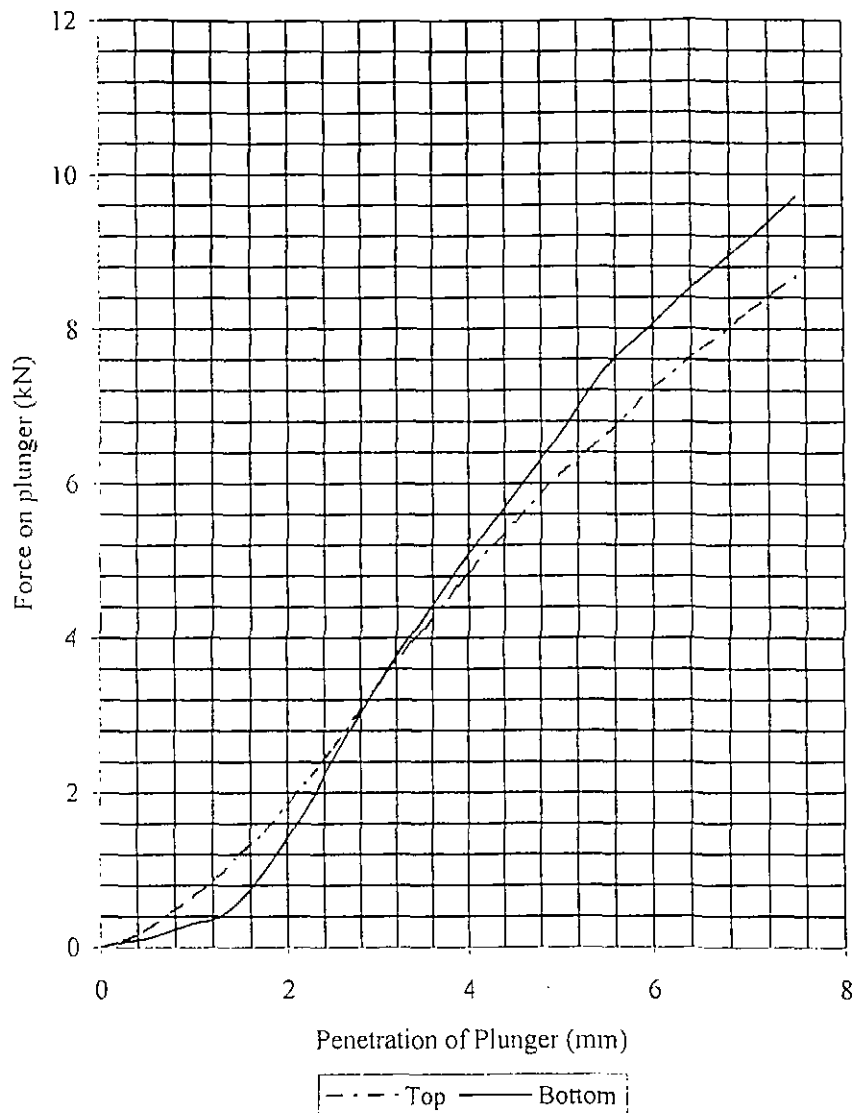
BS 1377 : Part 4 : 1990

Trial Pit Number

TP6

Depth (m) :

2.00



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Moisture Content:           | 22.5 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.45 | Soaking Time hrs                          | 0    | Sample Top               | 22.3 | Sample Top     | 30.5 |
| Dry Density Mg/m3:          | 1.18 | Swelling mm:                              | 0    | Sample Bottom            | 22.8 | Sample Bottom  | 33.2 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              | 3    |                                           |      |                          |      |                |      |

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|------------|----------|-------------|----------|
| Checked by | Date     | Approved By | Date     |
|            | 11/12/15 |             | 11/12/15 |

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PSL07/2659

# California Bearing Ratio Test.

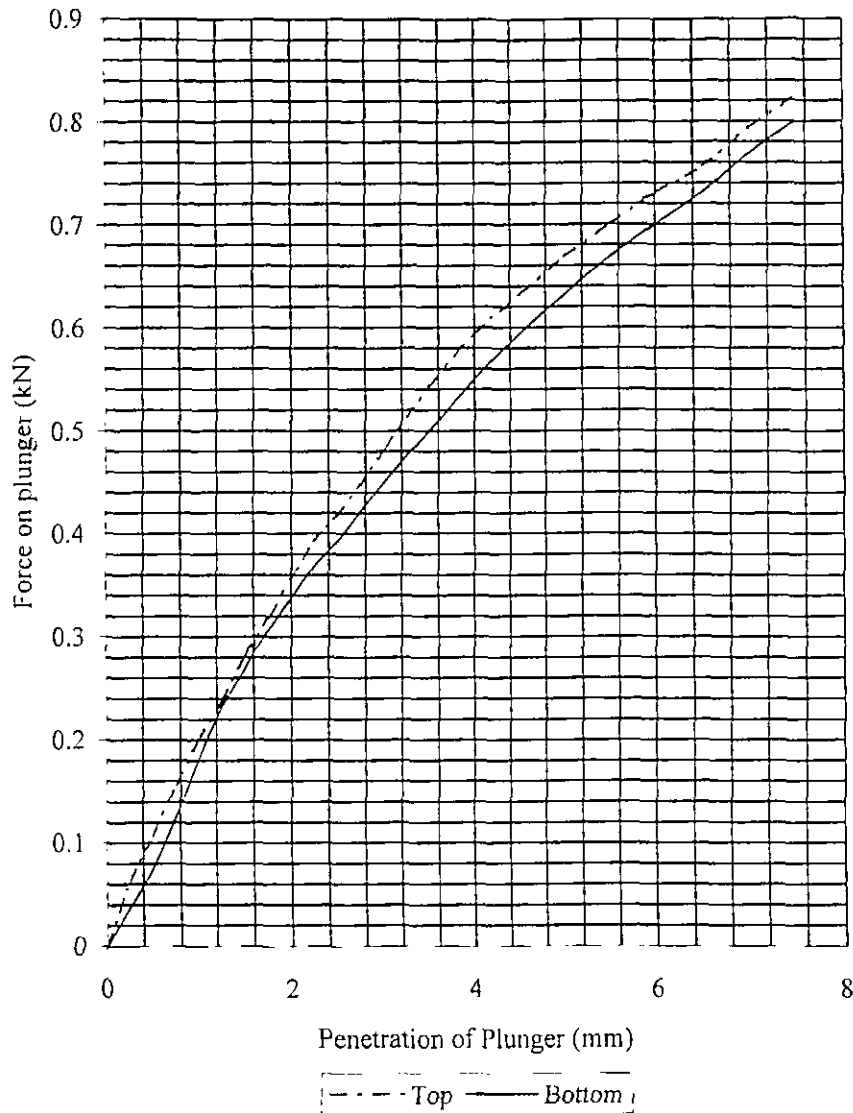
BS 1377 : Part 4 : 1990

Trial Pit Number

TP7

Depth (m) :

3.00



|                             |      |                                           |      |                          |      |                |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
| Moisture Content:           | 23.9 | Surcharge Kg                              | 4.00 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.92 | Soaking Time hrs                          | 0    | Sample Top               | 24.0 | Sample Top     | 3.3 |
| Dry Density Mg/m3:          | 1.55 | Swelling mm:                              | 0    | Sample Bottom            | 23.8 | Sample Bottom  | 3.2 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              |      |                                           |      |                          |      |                |     |

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|------------|---------|-------------|---------|
| Checked by | Date    | Approved By | Date    |
| RE         | 5/12/07 | RE          | 5/12/07 |

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| <b>PSL</b><br>Professional Soils Laboratory |  | NORTH GAWBER COLLIERY. | Contract No.<br>PSL07/2659 |
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# California Bearing Ratio Test.

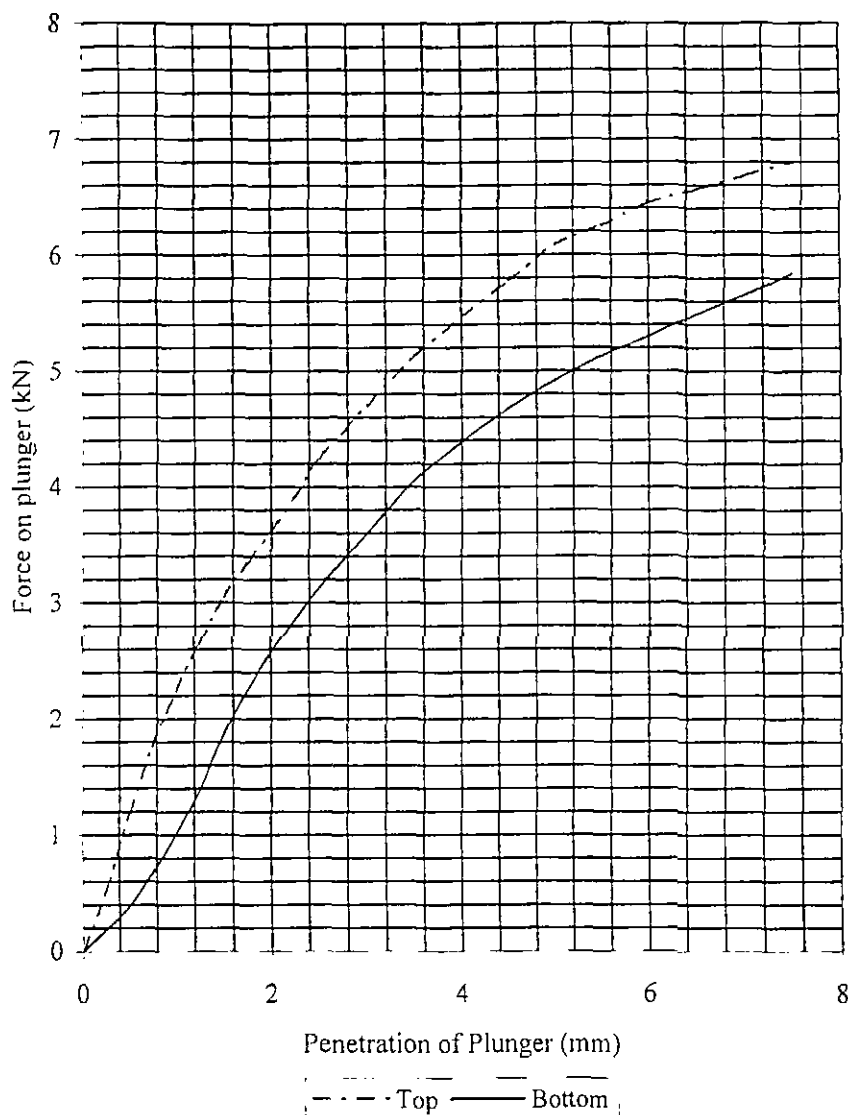
BS 1377 : Part 4 : 1990

Trial Pit Number

TP13

Depth (m) :

2.20



|                             |      |                                           |      |                          |      |                |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
| Moisture Content:           | 10.5 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.86 | Soaking Time hrs                          | 0    | Sample Top               | 10.2 | Sample Top     | 32.2 |
| Dry Density Mg/m3:          | 1.68 | Swelling mm:                              | 0    | Sample Bottom            | 10.8 | Sample Bottom  | 24.6 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve               | 25   |                                           |      |                          |      |                |      |

|            |          |             |          |
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| Checked by | Date     | Approved By | Date     |
|            | 11/11/15 |             | 11/11/15 |

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# California Bearing Ratio Test.

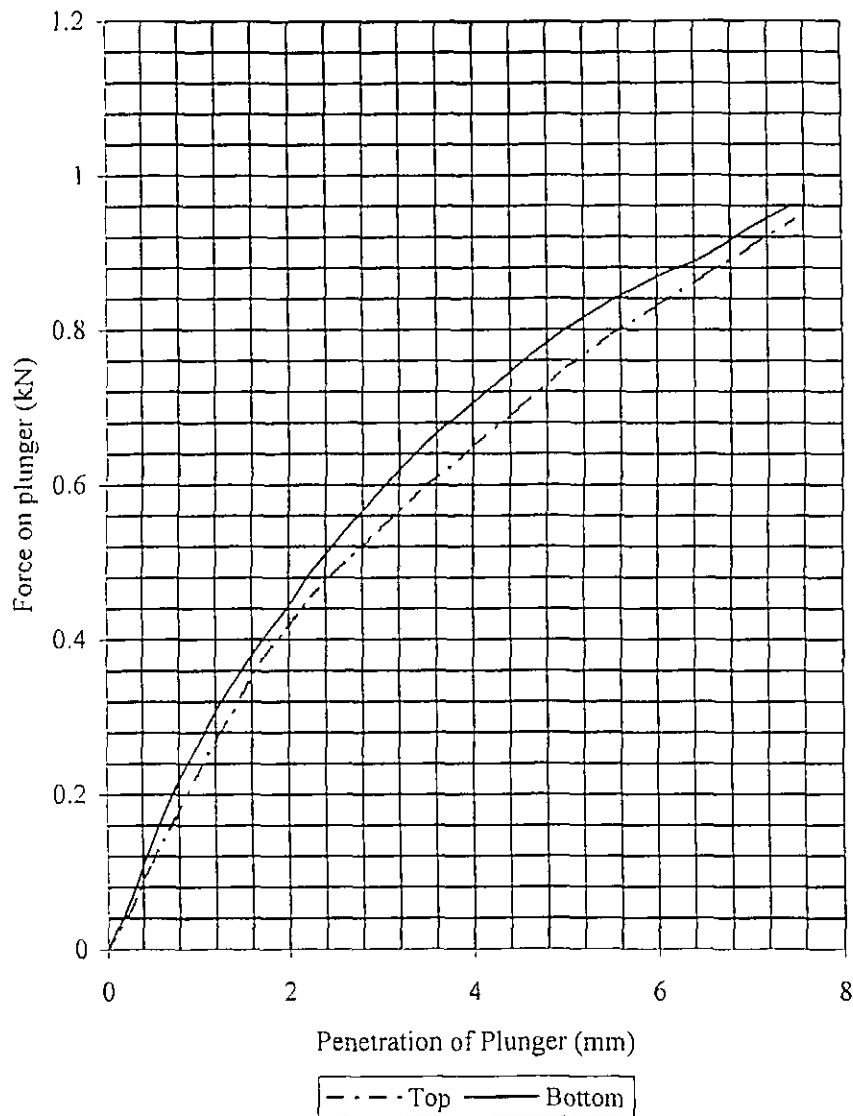
BS 1377 : Part 4 : 1990

Trial Pit Number

TP21

Depth (m) :

4.00



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 24.5 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 2.02 | Soaking Time hrs                          | 0    | Sample Top               | 24.6 | Sample Top     | 3.7 |
| Dry Density Mg/m3:          | 1.62 | Swelling mm:                              | 0    | Sample Bottom            | 24.3 | Sample Bottom  | 4.0 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 1    |                                           |      |                          |      |                |     |

| Checked by | Date    | Approved By | Date    |
|------------|---------|-------------|---------|
| <i>RE</i>  | 5/12/07 | <i>RE</i>   | 5/12/07 |

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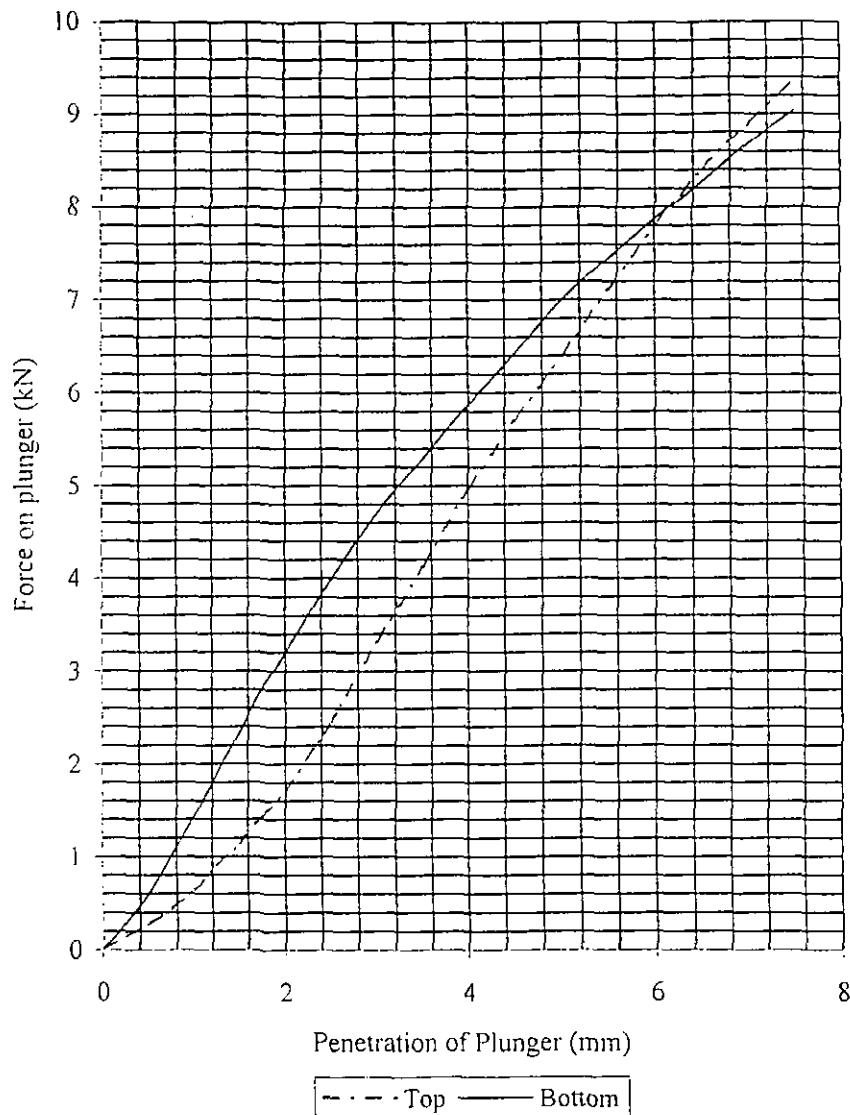
# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

Trial Pit Number

TP23

Depth (m) : 1.50



|                             |      |                                           |      |                          |      |                |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
| Moisture Content:           | 19.6 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.12 | Soaking Time hrs                          | 0    | Sample Top               | 19.4 | Sample Top     | 32.0 |
| Dry Density Mg/m3:          | 0.93 | Swelling mm:                              | 0    | Sample Bottom            | 19.8 | Sample Bottom  | 35.0 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              | 3    |                                           |      |                          |      |                |      |

| Checked by | Date     | Approved By | Date     |
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|            | 11/11/17 |             | 11/11/17 |

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# California Bearing Ratio Test.

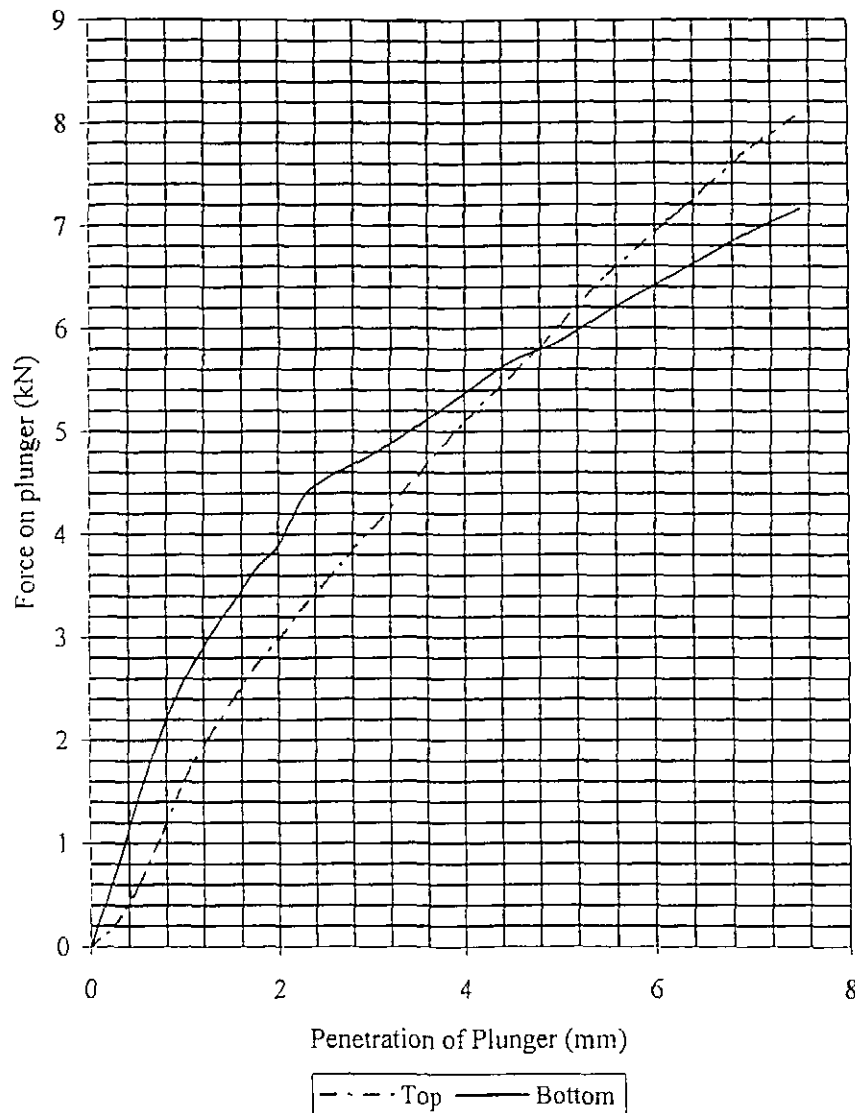
BS 1377 : Part 4 : 1990

Trial Pit Number

TP26

Depth (m) :

0.50



|                             |      |                                           |      |                          |      |                |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
| Moisture Content:           | 13.3 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.98 | Soaking Time hrs                          | 0    | Sample Top               | 13.2 | Sample Top     | 30.1 |
| Dry Density Mg/m3:          | 1.75 | Swelling mm:                              | 0    | Sample Bottom            | 13.4 | Sample Bottom  | 34.3 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              | 19   |                                           |      |                          |      |                |      |

|                    |         |                    |         |
|--------------------|---------|--------------------|---------|
| Checked by         | Date    | Approved By        | Date    |
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |



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# California Bearing Ratio Test.

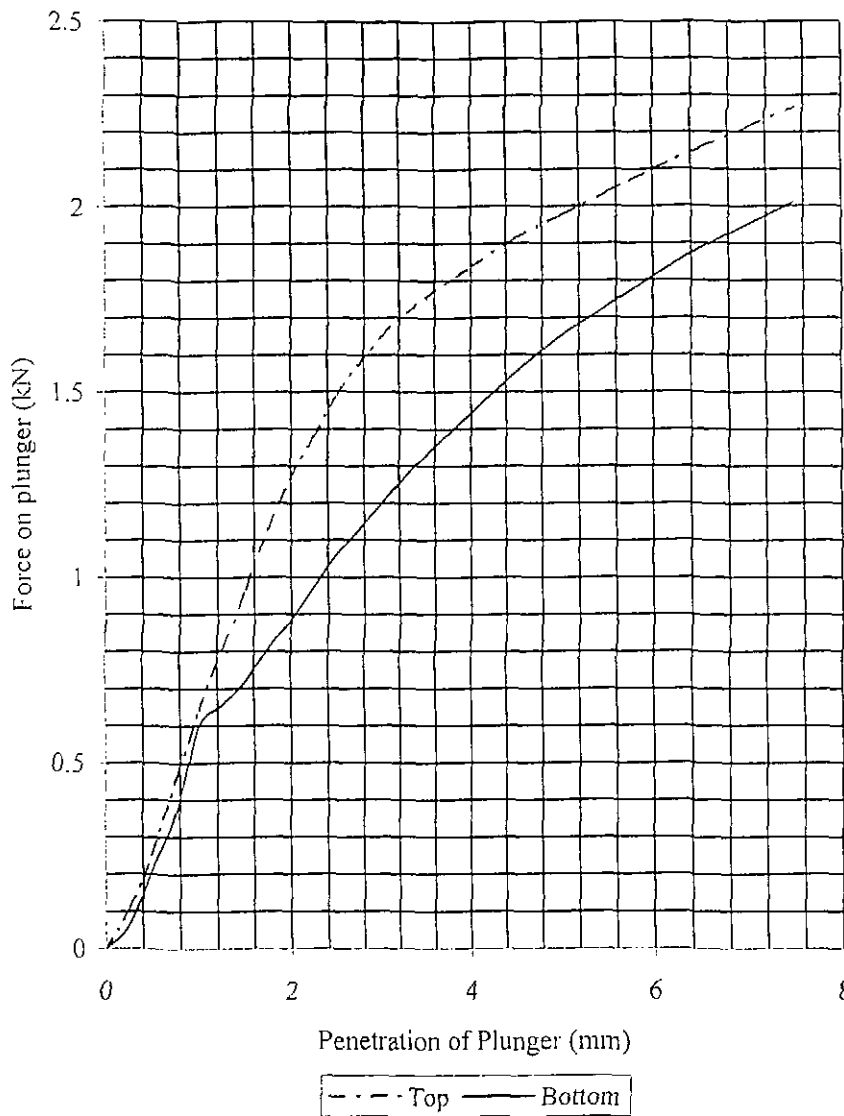
BS 1377 : Part 4 : 1990

Trial Pit Number

TP29

Depth (m) :

2.50



| Initial Sample Conditions                  |      | Test Conditions                           |      | Method of compaction 2.5 Kg Rammer |      |                |      |
|--------------------------------------------|------|-------------------------------------------|------|------------------------------------|------|----------------|------|
| Moisture Content:                          | 17.5 | Surcharge Kg:                             | 4.00 | Final Moisture Content %           |      | C.B.R. Value % |      |
| Bulk Density Mg/m <sup>3</sup> :           | 2.02 | Soaking Time hrs                          | 0    | Sample Top                         | 17.4 | Sample Top     | 11.3 |
| Dry Density Mg/m <sup>3</sup> :            | 1.72 | Swelling mm:                              | 0    | Sample Bottom                      | 17.6 | Sample Bottom  | 8.2  |
| Percentage retained on 20mm BS test sieve: |      | Remarks: See Summary of Soil Description. |      |                                    |      |                |      |
|                                            |      | 0                                         |      |                                    |      |                |      |

| Checked by | Date     | Approved By | Date     |
|------------|----------|-------------|----------|
|            | 12/12/15 |             | 12/12/15 |

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# California Bearing Ratio Test.

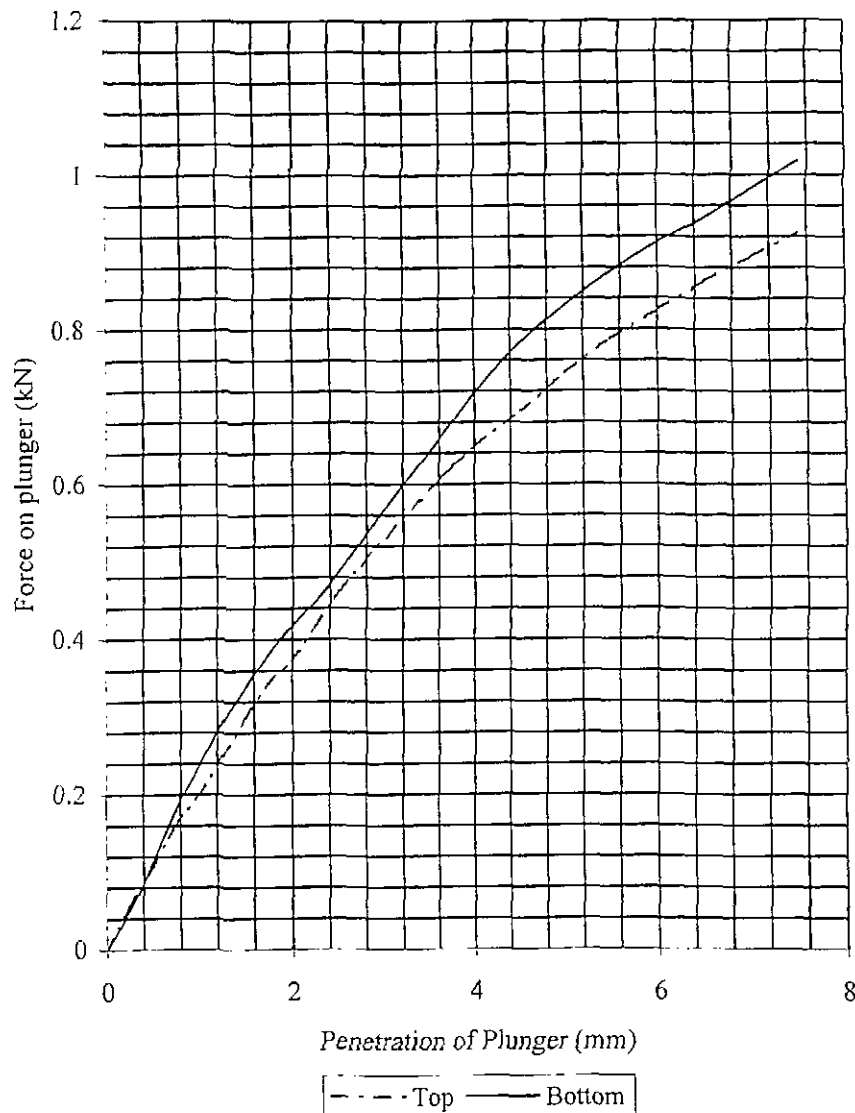
BS 1377 : Part 4 : 1990

Trial Pit Number

TP31

Depth (m) :

1.00



|                             |      |                                           |      |                          |      |                |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
| Moisture Content:           | 22.1 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 2.03 | Soaking Time hrs                          | 0    | Sample Top               | 22.4 | Sample Top     | 3.7 |
| Dry Density Mg/m3:          | 1.66 | Swelling mm:                              | 0    | Sample Bottom            | 21.8 | Sample Bottom  | 4.2 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              |      |                                           |      |                          |      |                |     |

|            |               |             |               |
|------------|---------------|-------------|---------------|
| Checked by | Date          | Approved By | Date          |
| <i>KE</i>  | <i>stulor</i> | <i>KE</i>   | <i>stulor</i> |

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# California Bearing Ratio Test.

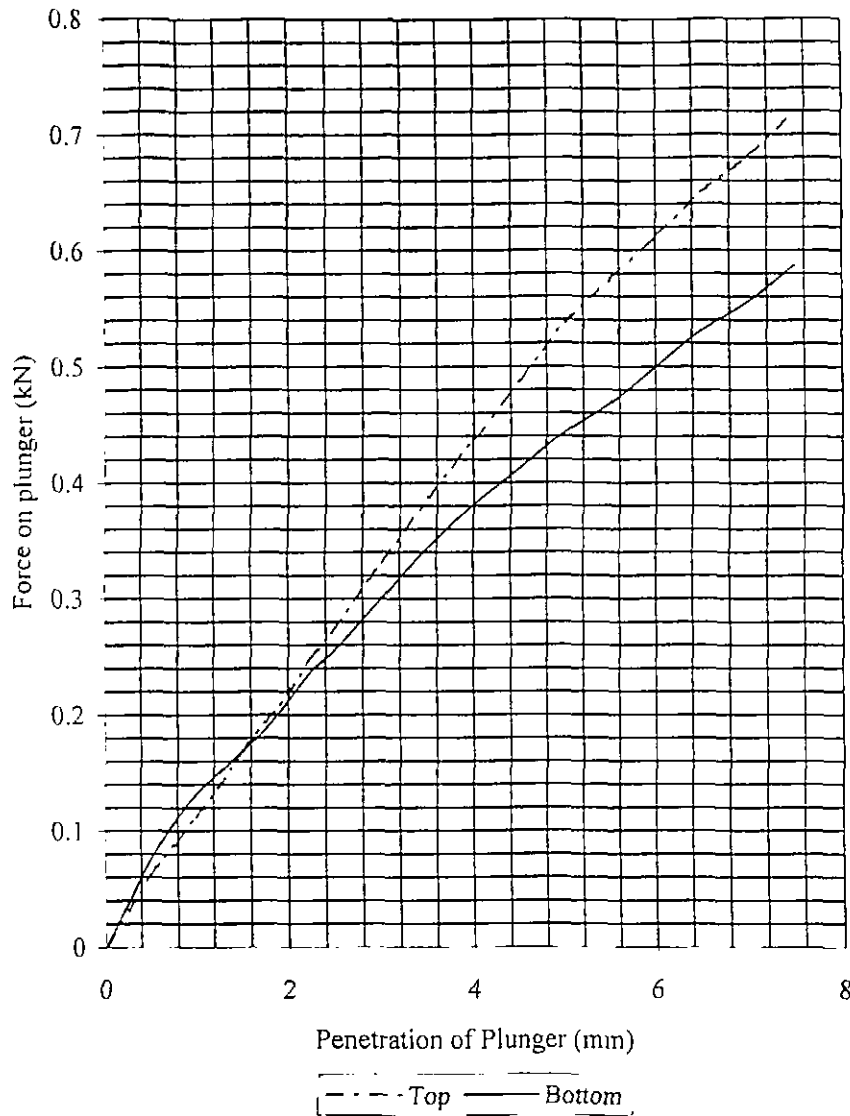
BS 1377 : Part 4 : 1990

Trial Pit Number

TP40

Depth (m) :

1.70



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 26.3 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.98 | Soaking Time hrs                          | 0    | Sample Top               | 25.8 | Sample Top     | 2.7 |
| Dry Density Mg/m3:          | 1.57 | Swelling mm:                              | 0    | Sample Bottom            | 26.7 | Sample Bottom  | 2.2 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 1    |                                           |      |                          |      |                |     |

| Checked by | Date          | Approved By | Date          |
|------------|---------------|-------------|---------------|
| <i>RE</i>  | <i>stulen</i> | <i>RE</i>   | <i>stulen</i> |

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Contract No.

PSL07/2659

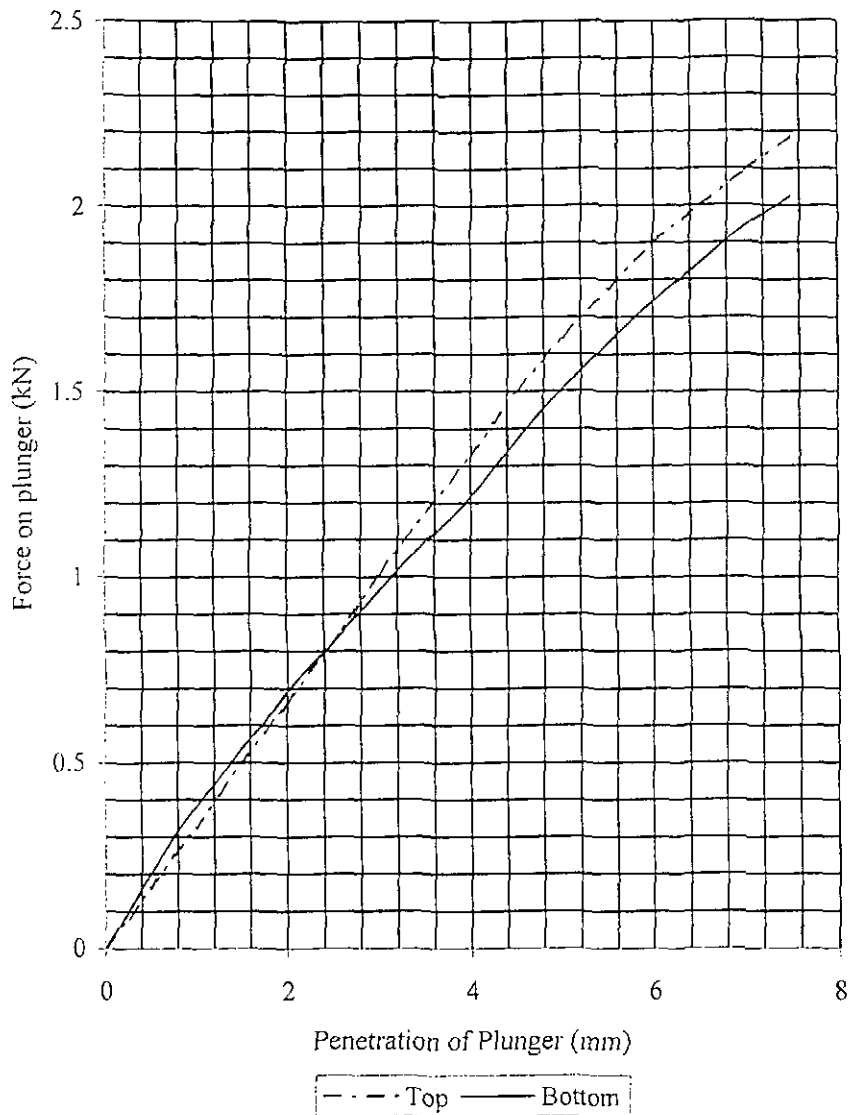
# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

Trial Pit Number

TP44

Depth (m) : 1.00



|                             |      |                                           |      |                          |      |                |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
| Moisture Content:           | 16.9 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.90 | Soaking Time hrs                          | 0    | Sample Top               | 16.6 | Sample Top     | 8.2 |
| Dry Density Mg/m3:          | 1.63 | Swelling mm:                              | 0    | Sample Bottom            | 17.1 | Sample Bottom  | 7.5 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 3    |                                           |      |                          |      |                |     |

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| Checked by | Date     | Approved By | Date     |
|            | 12/12/15 |             | 12/12/15 |

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Contract No.

PSL07/2659



# California Bearing Ratio Test.

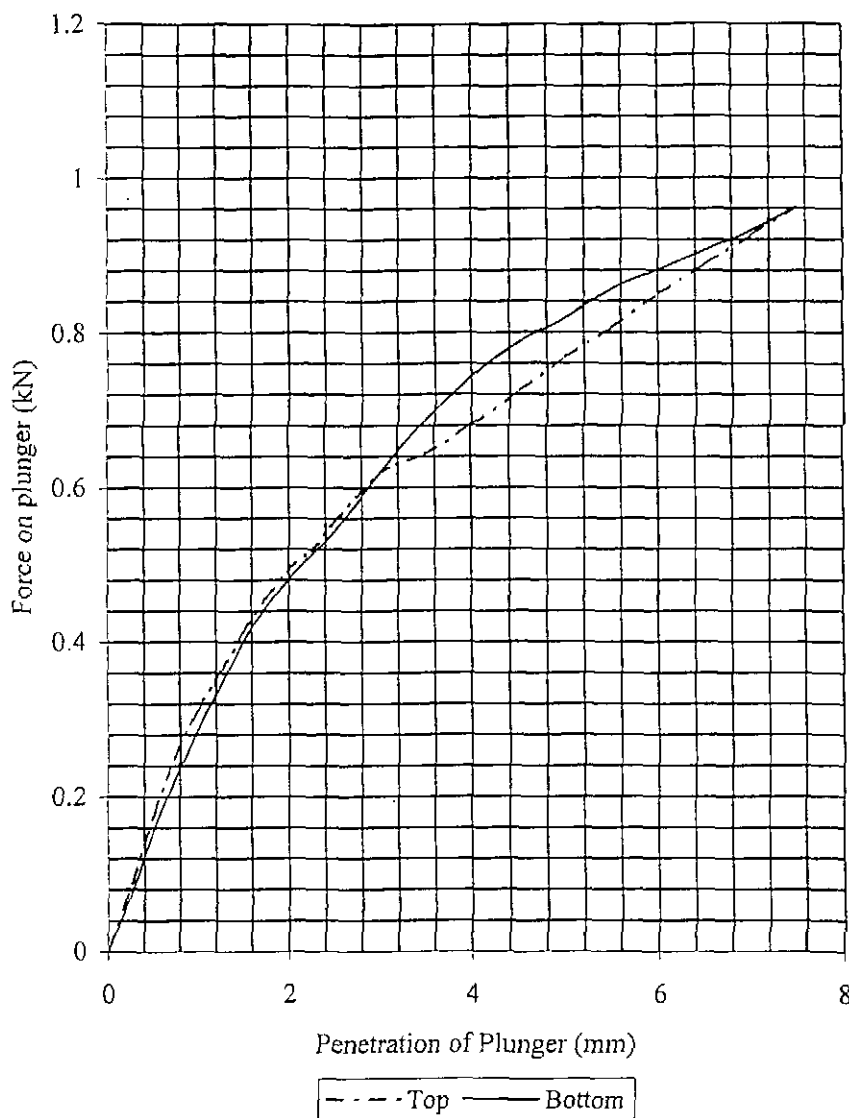
BS 1377 : Part 4 : 1990

Trial Pit Number

TP46

Depth (m) :

2.20



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 27.9 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.97 | Soaking Time hrs                          | 0    | Sample Top               | 28.0 | Sample Top     | 4.2 |
| Dry Density Mg/m3:          | 1.54 | Swelling mm:                              | 0    | Sample Bottom            | 27.9 | Sample Bottom  | 4.1 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 1    |                                           |      |                          |      |                |     |

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| <i>KE</i>  | <i>1/12/01</i> | <i>KE</i>   | <i>1/12/01</i> |



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# California Bearing Ratio Test.

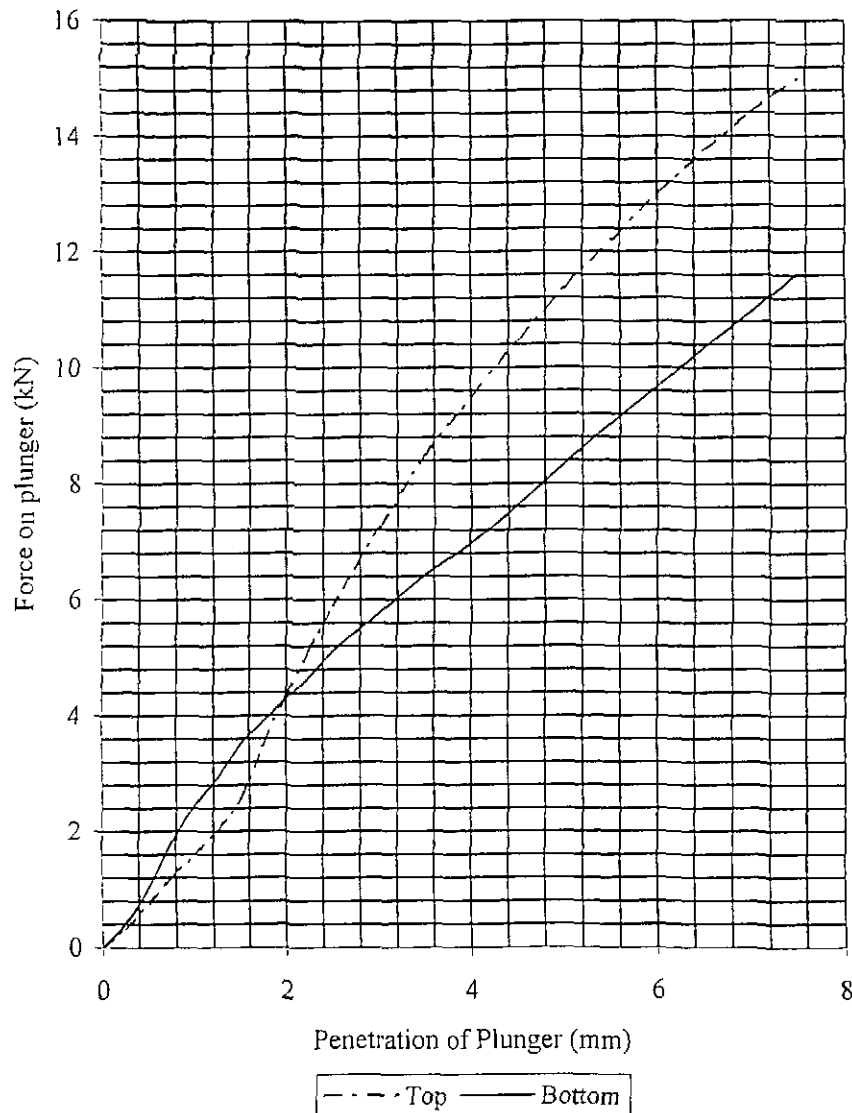
BS 1377 : Part 4 : 1990

Trial Pit Number

TP47

Depth (m) :

1.00



|                             |      |                                           |      |                          |      |                |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
| Moisture Content:           | 13.9 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.76 | Soaking Time hrs                          | 0    | Sample Top               | 13.8 | Sample Top     | 56.8 |
| Dry Density Mg/m3:          | 1.55 | Swelling mm:                              | 0    | Sample Bottom            | 13.9 | Sample Bottom  | 41.6 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              | 10   |                                           |      |                          |      |                |      |

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# California Bearing Ratio Test.

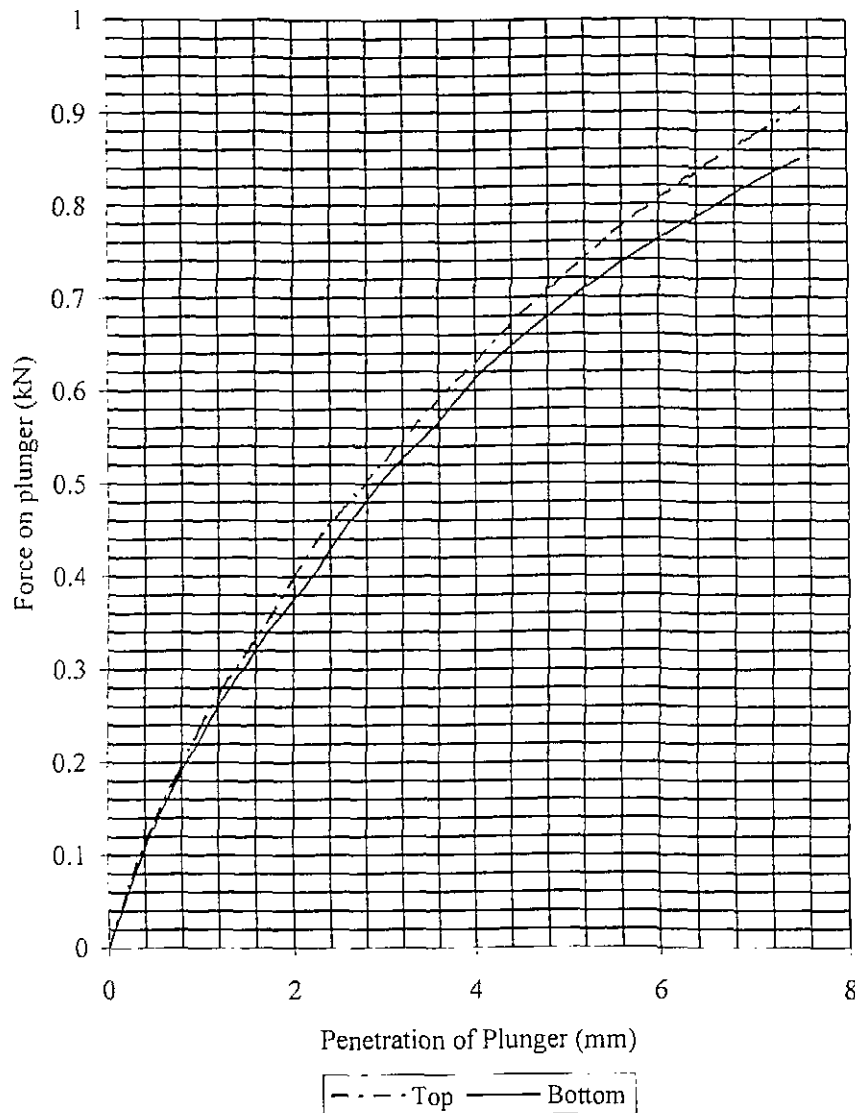
BS 1377 : Part 4 : 1990

Trial Pit Number

TP57

Depth (m) :

4.20



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 21.4 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.94 | Soaking Time hrs                          | 0    | Sample Top               | 21.1 | Sample Top     | 3.6 |
| Dry Density Mg/m3:          | 1.60 | Swelling mm:                              | 0    | Sample Bottom            | 21.6 | Sample Bottom  | 3.5 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              |      |                                           |      |                          |      |                |     |

| Checked by | Date         | Approved By | Date         |
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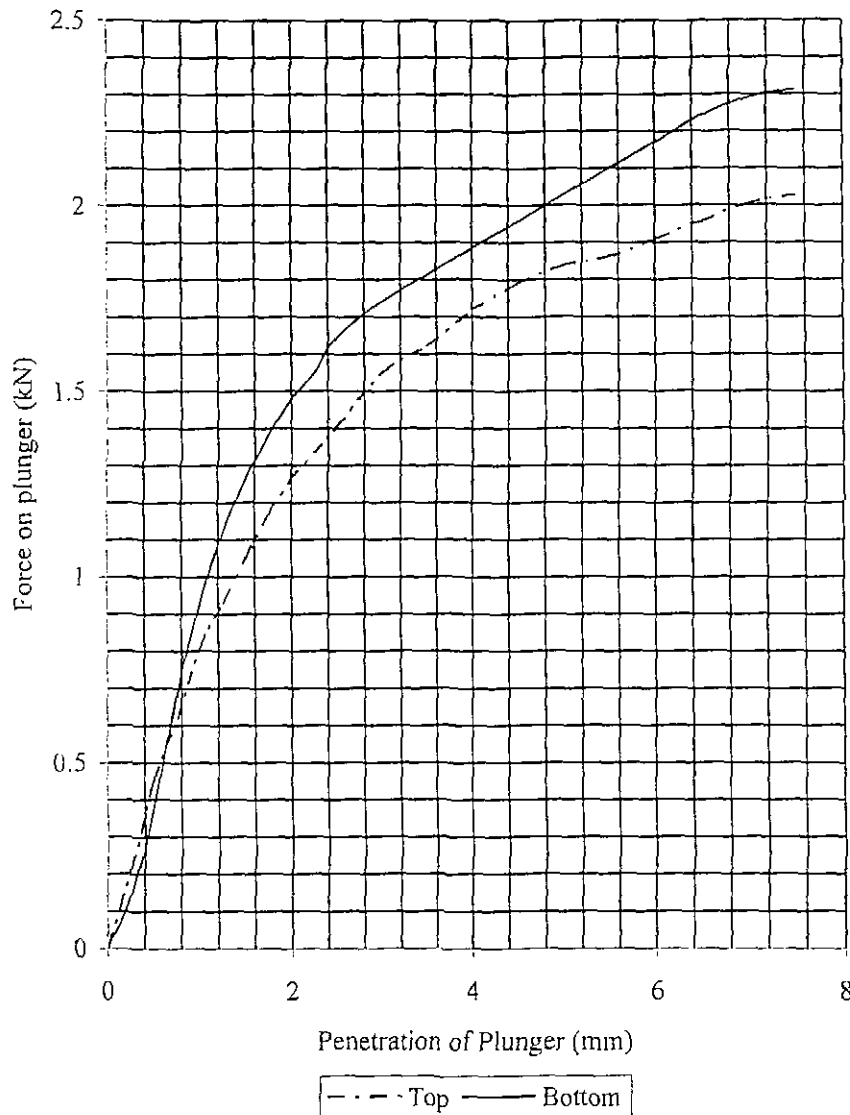
# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

Trial Pit Number

TP59

Depth (m) : 1.40



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Moisture Content:           | 29.9 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.84 | Soaking Time hrs                          | 0    | Sample Top               | 30.0 | Sample Top     | 10.7 |
| Dry Density Mg/m3:          | 1.42 | Swelling mm:                              | 0    | Sample Bottom            | 29.8 | Sample Bottom  | 12.5 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              |      |                                           |      |                          |      |                |      |

| Checked by         | Date    | Approved By        | Date    |
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| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

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# California Bearing Ratio Test.

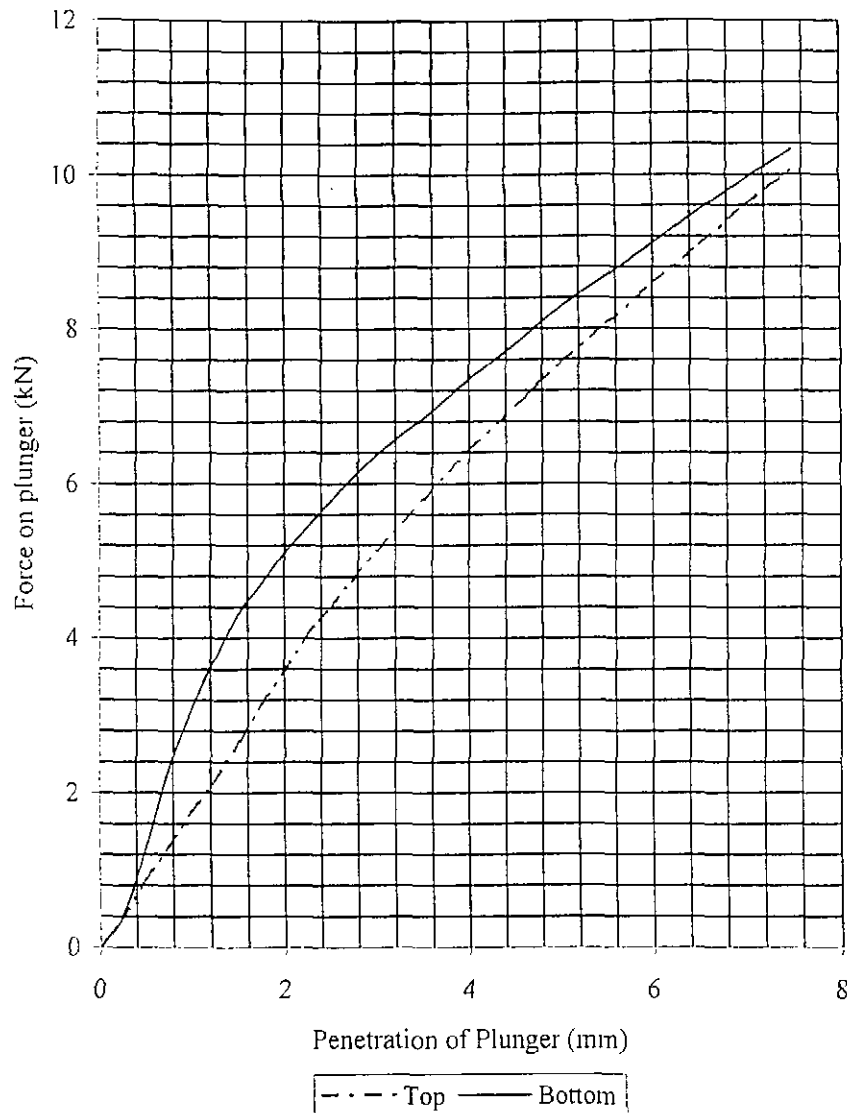
BS 1377 : Part 4 : 1990

Trial Pit Number

TP62

Depth (m) :

1.00



|                             |      |                                           |      |                          |      |                |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
| Moisture Content:           | 15.5 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.70 | Soaking Time hrs                          | 0    | Sample Top               | 15.7 | Sample Top     | 37.8 |
| Dry Density Mg/m3:          | 1.47 | Swelling mm:                              | 0    | Sample Bottom            | 15.3 | Sample Bottom  | 43.7 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              | 11   |                                           |      |                          |      |                |      |

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|            | 11/11/15 |             | 11/11/15 |

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# California Bearing Ratio Test.

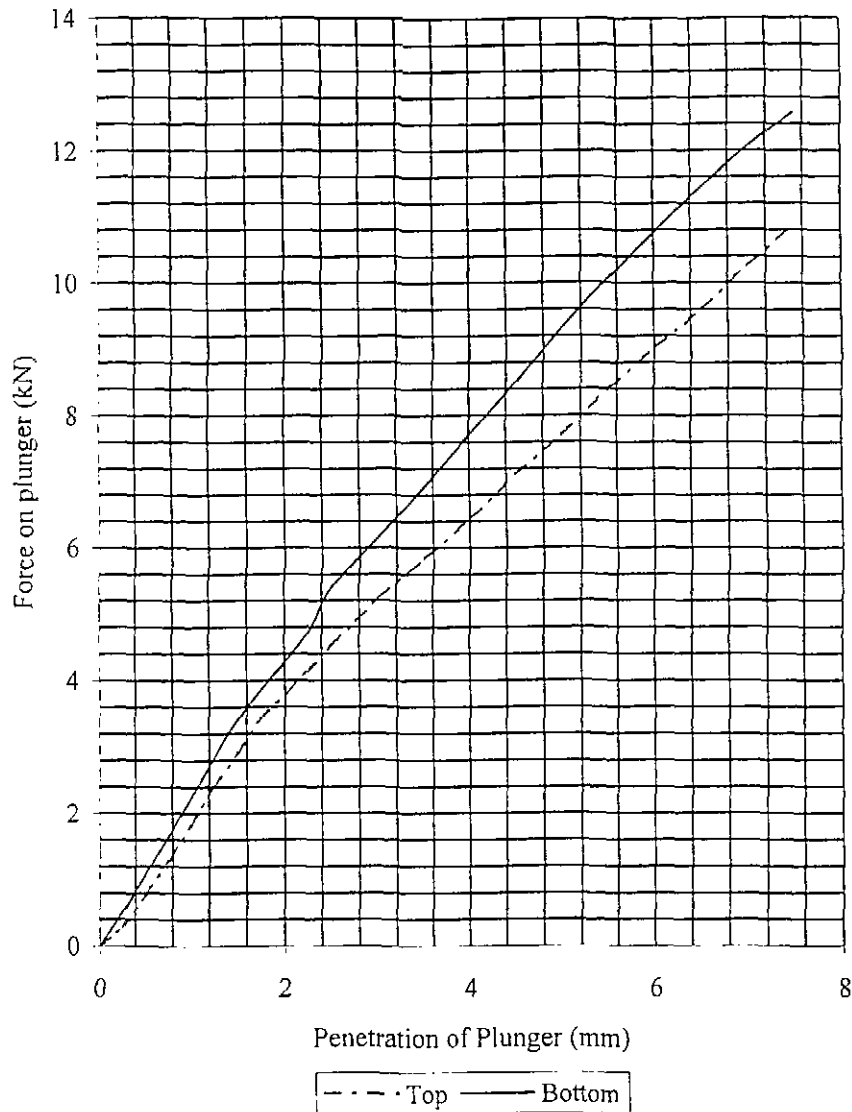
BS 1377 : Part 4 : 1990

Trial Pit Number

TP68

Depth (m) :

1.10



|                             |      |                                           |      |                          |      |                |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
| Moisture Content:           | 14.9 | Surcharge Kg:                             | 4.00 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 2.05 | Soaking Time hrs                          | 0    | Sample Top               | 14.9 | Sample Top     | 38.5 |
| Dry Density Mg/m3:          | 1.78 | Swelling mm:                              | 0    | Sample Bottom            | 15.0 | Sample Bottom  | 46.6 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              |      |                                           |      |                          |      |                |      |

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| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |



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# California Bearing Ratio Test.

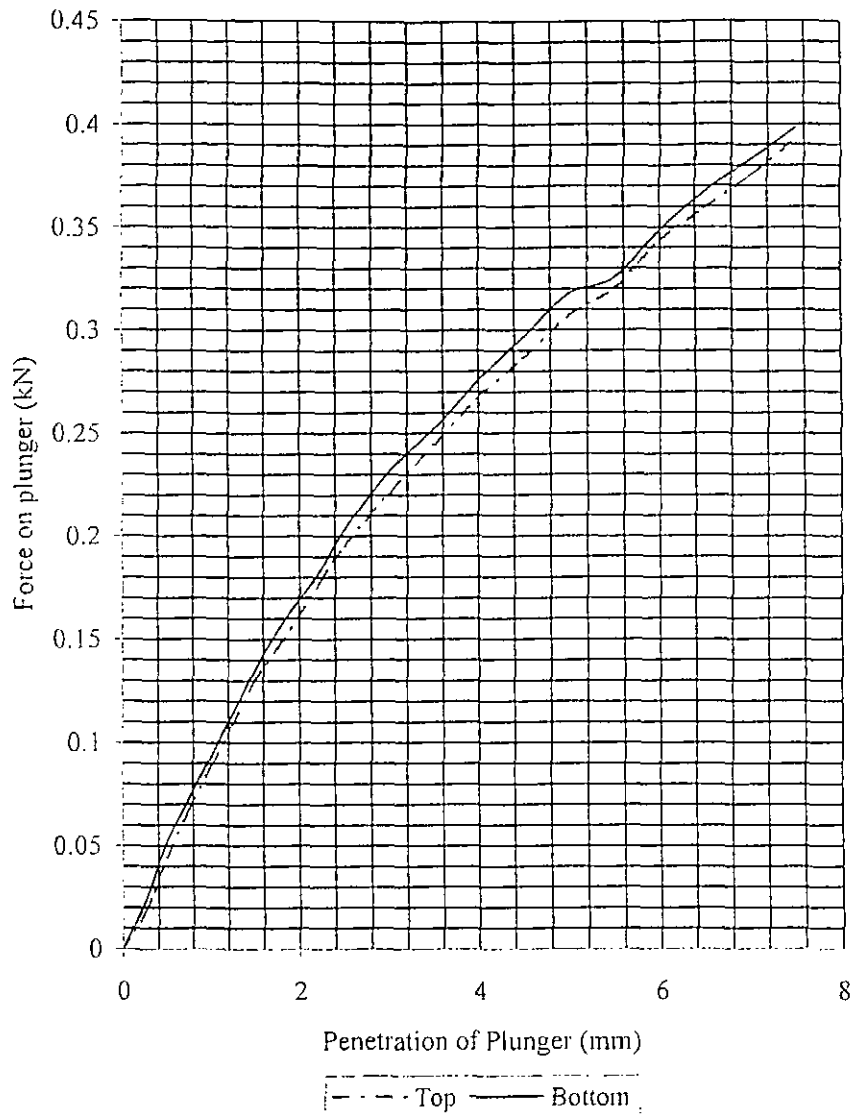
BS 1377 : Part 4 : 1990

Borehole Number

BH102

Depth (m) :

3.00-3.50



|                             |      |                                           |      |                          |      |                |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
| Moisture Content:           | 23.4 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.84 | Soaking Time hrs                          | 0    | Sample Top               | 23.4 | Sample Top     | 1.5 |
| Dry Density Mg/m3:          | 1.49 | Swelling mm:                              | 0    | Sample Bottom            | 23.4 | Sample Bottom  | 1.6 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 0    |                                           |      |                          |      |                |     |

| Checked by         | Date   | Approved By        | Date   |
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| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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# California Bearing Ratio Test.

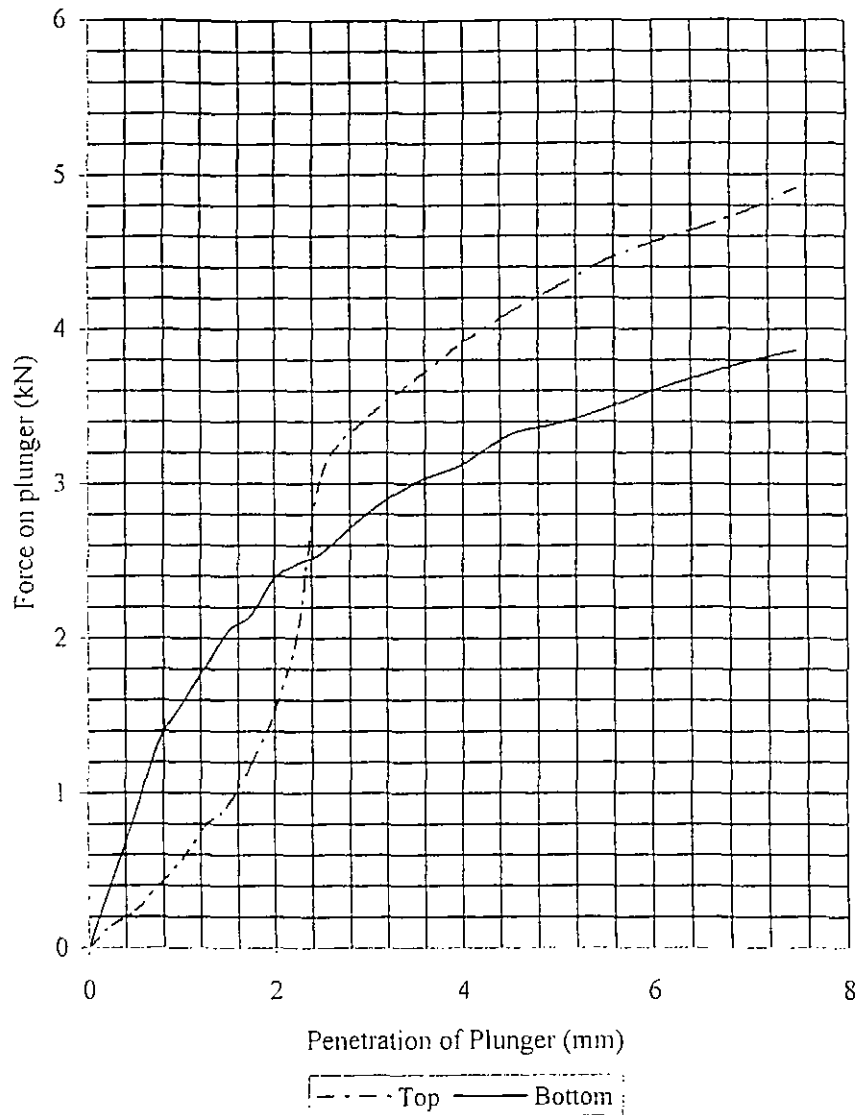
BS 1377 : Part 4 : 1990

Borehole Number

BH104

Depth (m) :

3.00-3.50



|                             |      |                                           |      |                          |      |                |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |      |
| Moisture Content:           | 14.3 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 1.86 | Soaking Time hrs                          | 0    | Sample Top               | 13.9 | Sample Top     | 23.1 |
| Dry Density Mg/m3:          | 1.63 | Swelling mm:                              | 0    | Sample Bottom            | 14.9 | Sample Bottom  | 19.3 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              | 6    |                                           |      |                          |      |                |      |

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| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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# California Bearing Ratio Test.

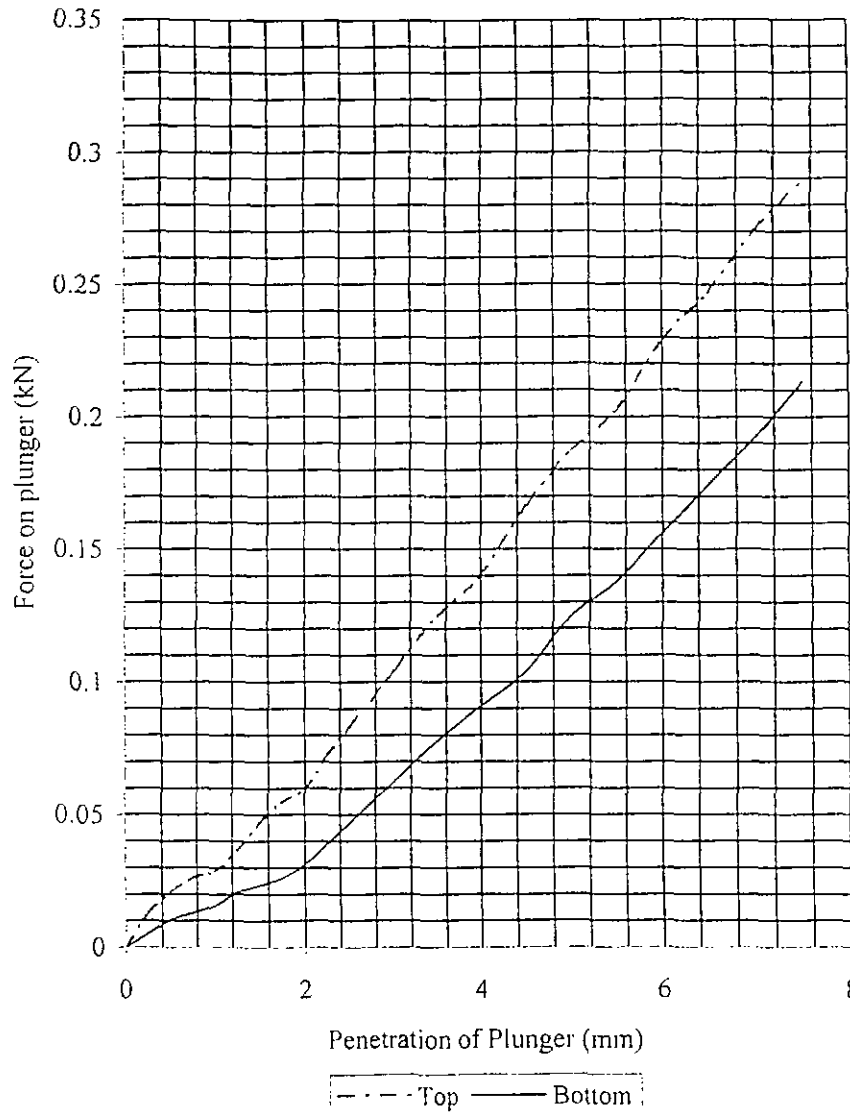
Non Compliance with - BS 1377 : Part 4 : 1990

Borehole Number

BH107A

Depth (m) :

2.50-3.00



|                             |      |                                           |      |                          |      |                |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
| Moisture Content:           | 21.6 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.85 | Soaking Time hrs                          | 0    | Sample Top               | 21.2 | Sample Top     | 0.9 |
| Dry Density Mg/m3:          | 1.52 | Swelling mm:                              | 0    | Sample Bottom            | 21.9 | Sample Bottom  | 0.6 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 43   |                                           |      |                          |      |                |     |

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# California Bearing Ratio Test.

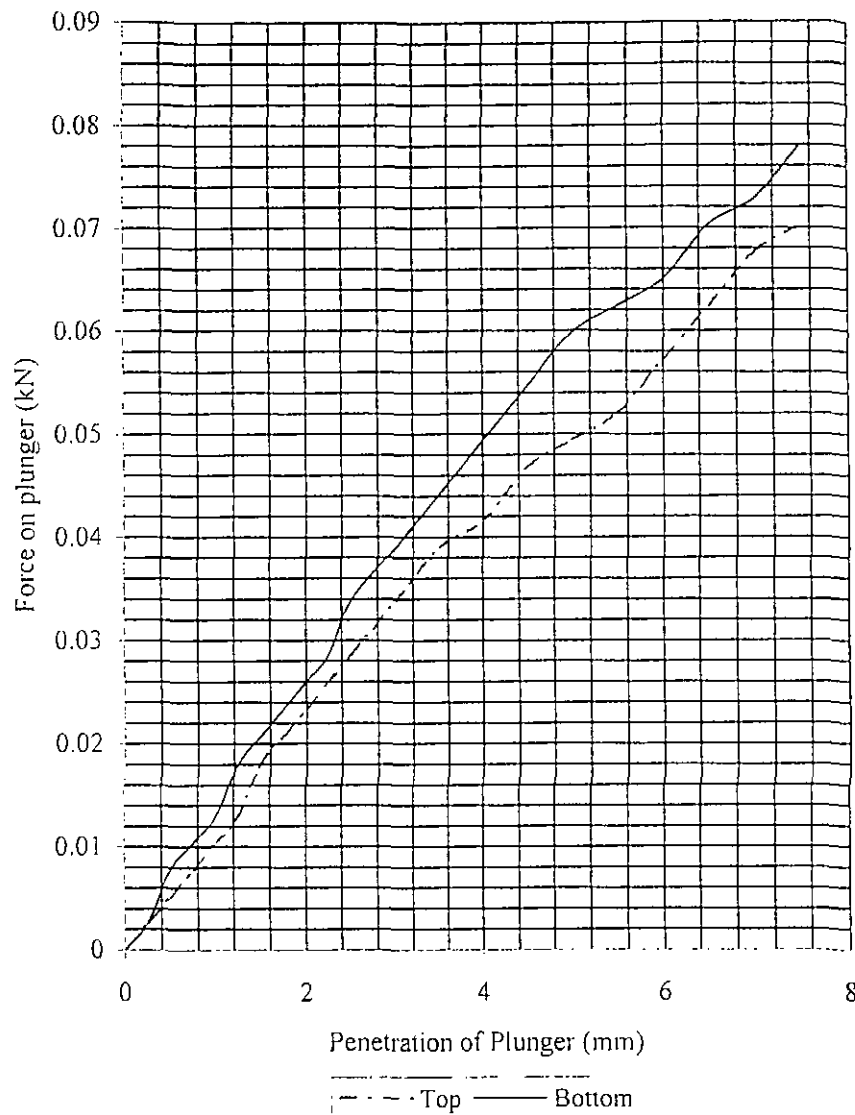
BS 1377 : Part 4 : 1990

Borehole Number

BH112

Depth (m) :

0.20-1.50



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 39.7 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 1.64 | Soaking Time hrs                          | 0    | Sample Top               | 40.9 | Sample Top     | 0.2 |
| Dry Density Mg/m3:          | 1.18 | Swelling mm:                              | 0    | Sample Bottom            | 38.5 | Sample Bottom  | 0.3 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 0    |                                           |      |                          |      |                |     |

| Checked by         | Date   | Approved By        | Date   |
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| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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# California Bearing Ratio Test.

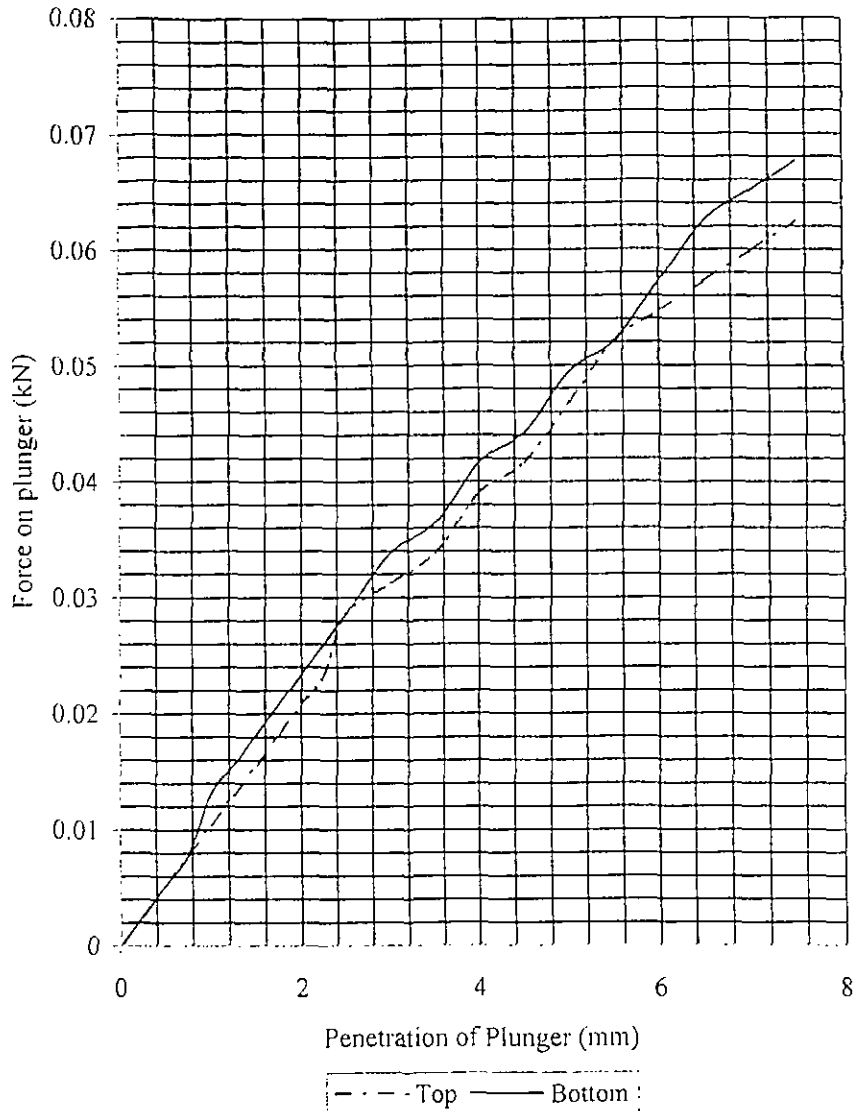
BS 1377 : Part 4 : 1990

Borehole Number

BH117

Depth (m) :

1.50-3.00



|                                            |      |                                           |      |                                    |      |                |     |
|--------------------------------------------|------|-------------------------------------------|------|------------------------------------|------|----------------|-----|
| Initial Sample Conditions                  |      | Test Conditions                           |      | Method of compaction 2.5 Kg Rammer |      |                |     |
| Moisture Content:                          | 32.1 | Surcharge Kg:                             | 4.20 | Final Moisture Content %           |      | C.B.R. Value % |     |
| Bulk Density Mg/m <sup>3</sup> :           | 1.58 | Soaking Time hrs                          | 0    | Sample Top                         | 31.5 | Sample Top     | 0.2 |
| Dry Density Mg/m <sup>3</sup> :            | 1.19 | Swelling mm:                              | 0    | Sample Bottom                      | 32.7 | Sample Bottom  | 0.2 |
| Percentage retained on 20mm BS test sieve: |      | Remarks: See Summary of Soil Description. |      |                                    |      |                |     |
|                                            |      | 0                                         |      |                                    |      |                |     |

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# California Bearing Ratio Test.

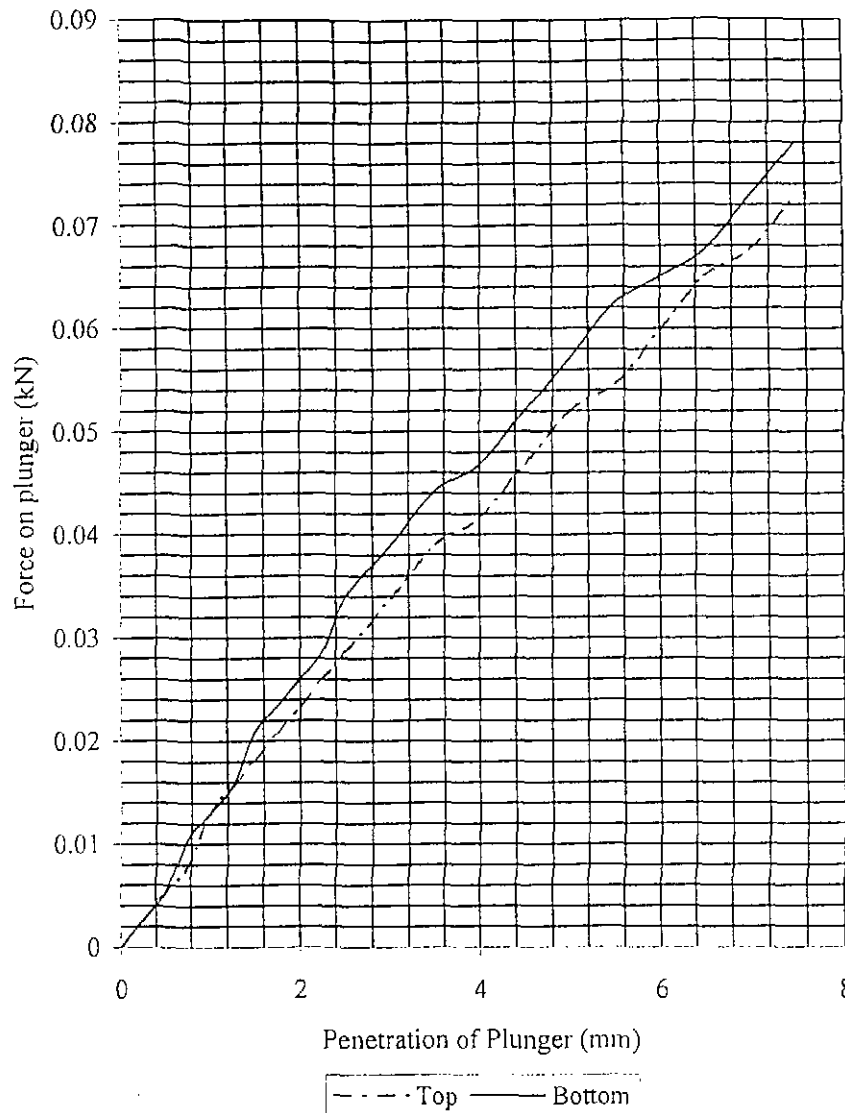
BS 1377 : Part 4 : 1990

Borehole Number

BH118

Depth (m) :

1.50-4.20



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 2.5 Kg Rammer  |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 20.1 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 2.00 | Soaking Time hrs                          | 0    | Sample Top               | 20.2 | Sample Top     | 0.3 |
| Dry Density Mg/m3:          | 1.66 | Swelling mm:                              | 0    | Sample Bottom            | 20.0 | Sample Bottom  | 0.3 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 6    |                                           |      |                          |      |                |     |

| Checked by         | Date   | Approved By        | Date   |
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| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

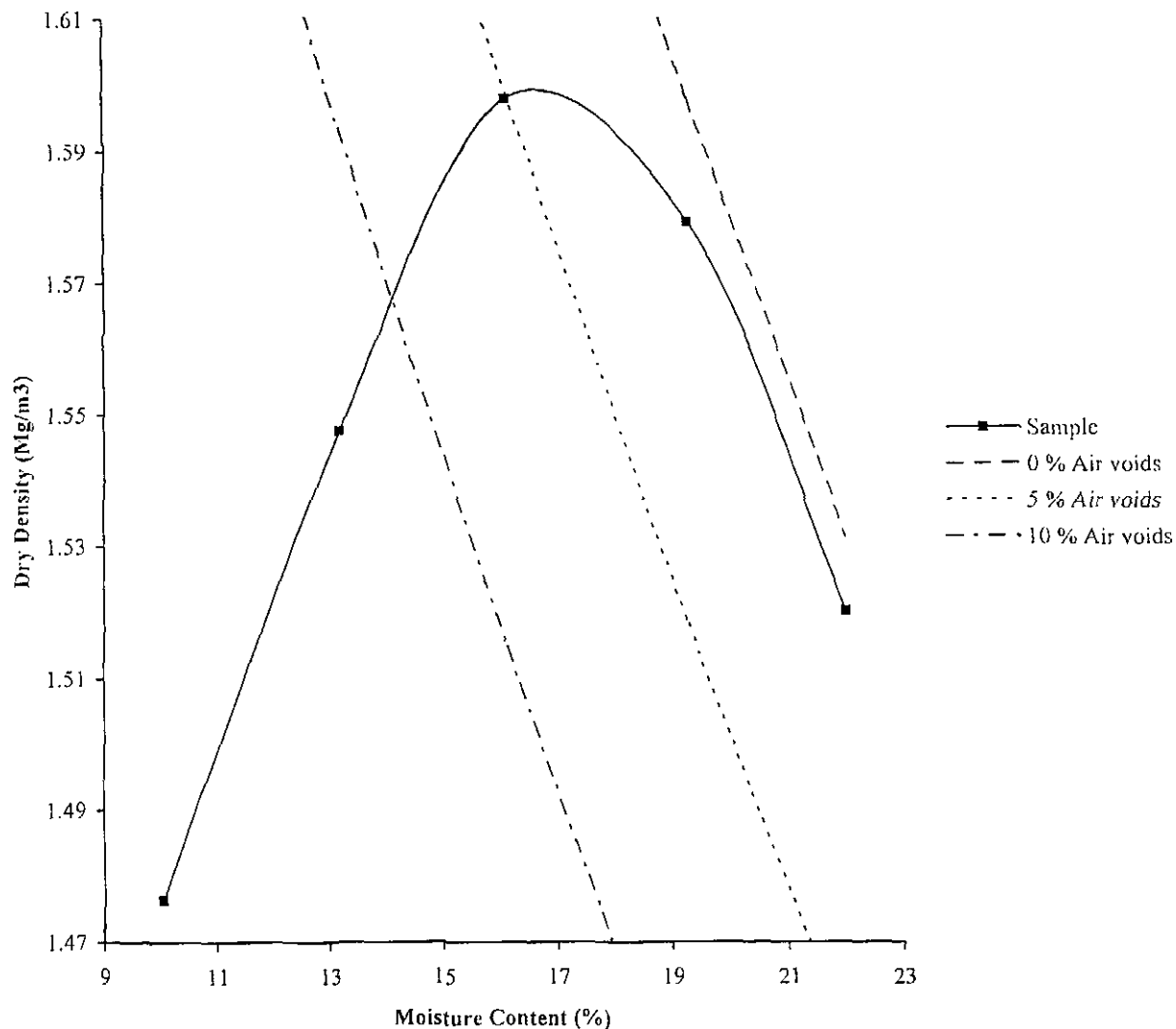
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP8

Depth (m) : 0.60



|                               |                                   |                      |                                              |                 |
|-------------------------------|-----------------------------------|----------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 19                                | Method of Compaction | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.31                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m3):  |                                   | 1.60                 | Material Retained on 20.0 mm Test Sieve (%): | 3               |
| Optimum Moisture Content (%): |                                   | 17                   |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                      |                                              |                 |

| Checked By | Date     | Approved By | Date     |
|------------|----------|-------------|----------|
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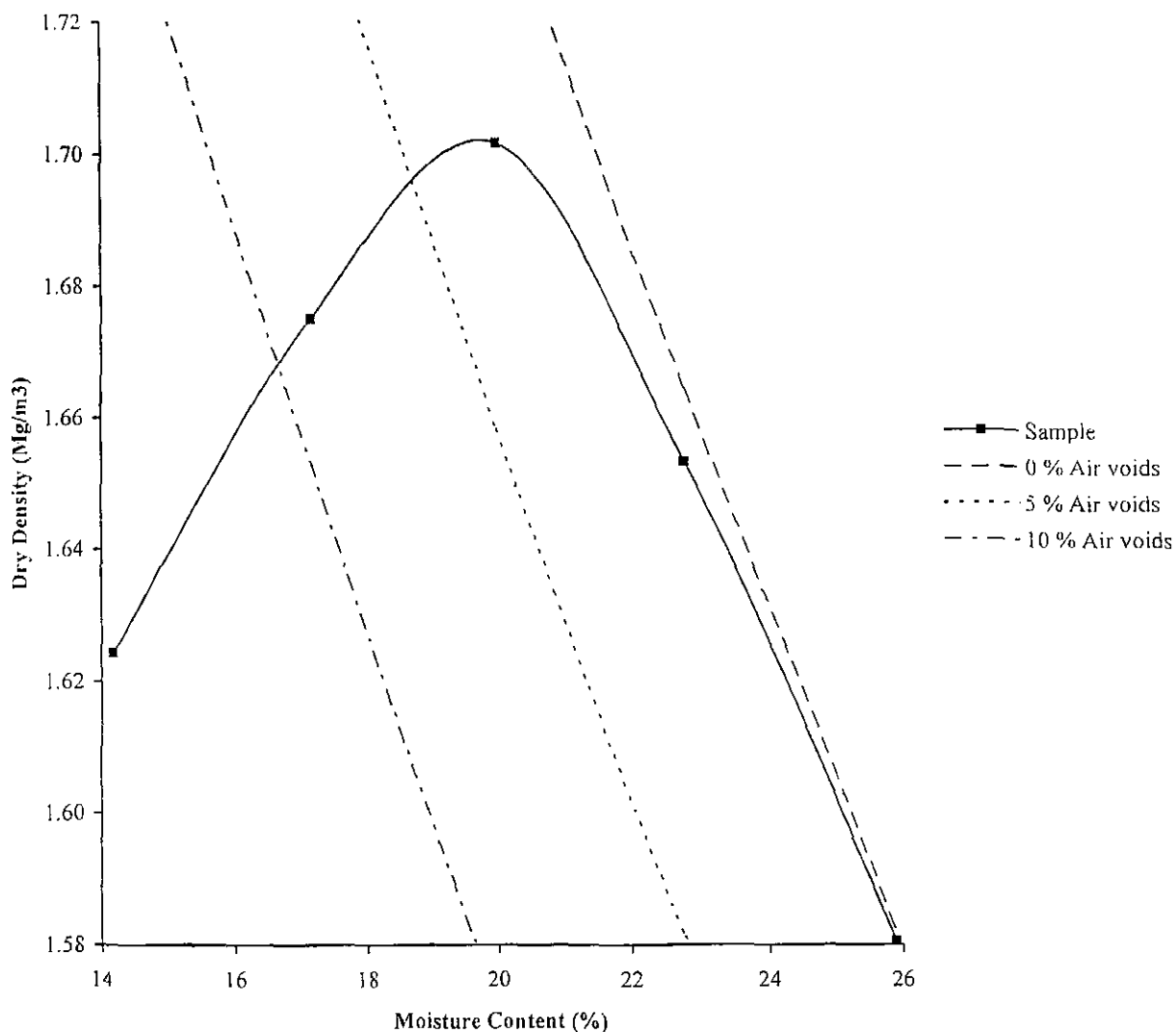
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP14

Depth (m) : 4.00



|                               |                                   |                                              |                                              |                 |
|-------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 20                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.68                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m3):  | 1.70                              | Material Retained on 20.0 mm Test Sieve (%): | 0                                            |                 |
| Optimum Moisture Content (%): | 20                                |                                              |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By | Date           | Approved By | Date           |
|------------|----------------|-------------|----------------|
| <i>RL</i>  | <i>5/12/07</i> | <i>RL</i>   | <i>5/12/07</i> |



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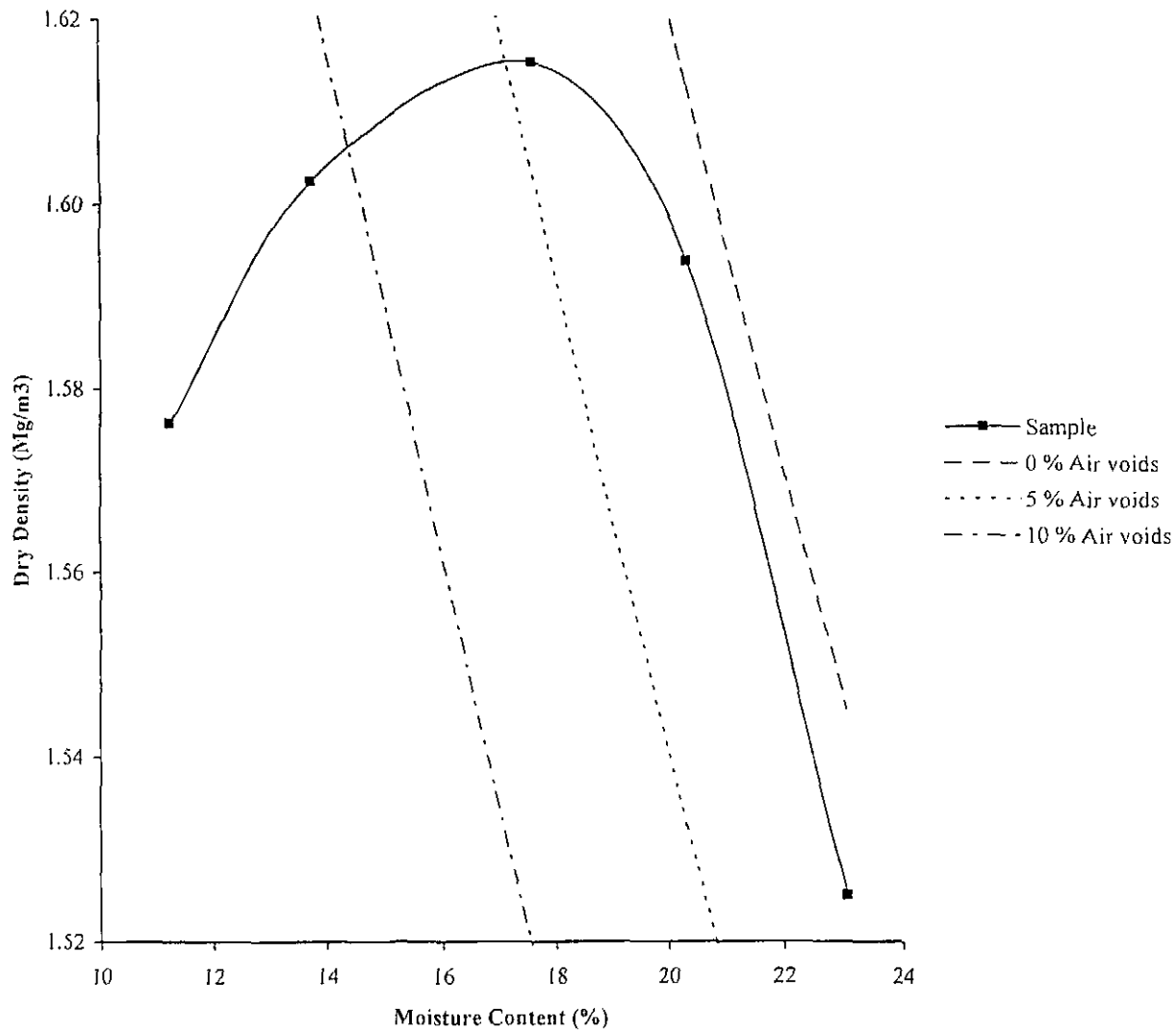
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP16

Depth (m) : 2.00



|                               |                                   |                      |                                              |                 |
|-------------------------------|-----------------------------------|----------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 18                                | Method of Compaction | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.40                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): | 7               |
| Maximum Dry Density (mg/m3):  | 1.62                              |                      | Material Retained on 20.0 mm Test Sieve (%): | 7               |
| Optimum Moisture Content (%): | 18                                |                      |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                      |                                              |                 |

| Checked By         | Date    | Approved By        | Date    |
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| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

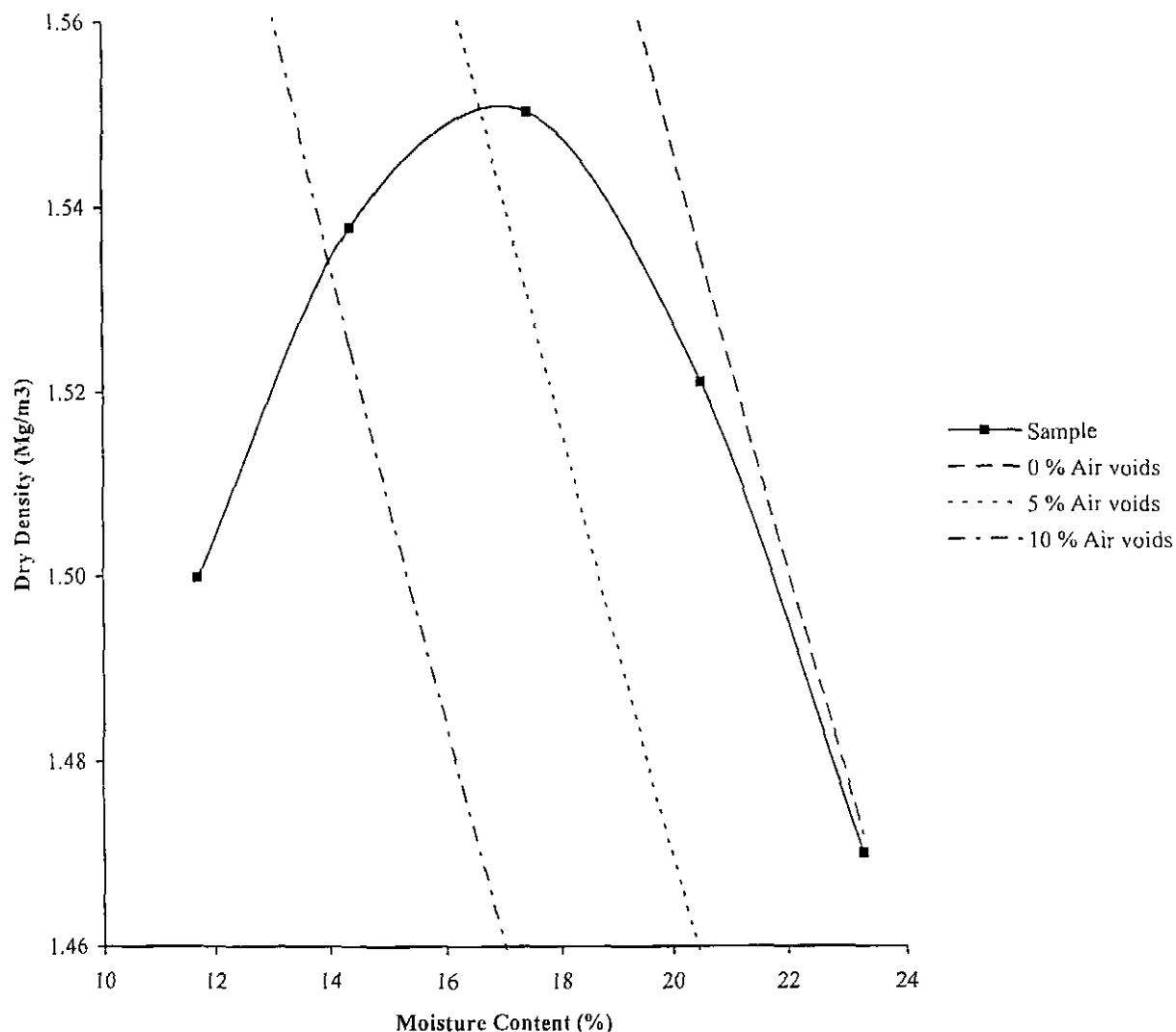
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP18

Depth (m) : 2.00



|                               |                                   |                                              |                                                |
|-------------------------------|-----------------------------------|----------------------------------------------|------------------------------------------------|
| Initial Moisture Content:     | 14                                | Method of Compaction                         | 2.5Kg / Separate Sample                        |
| Particle Density (Mg/m3):     | 2.24                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): 0 |
| Maximum Dry Density (mg/m3):  | 1.55                              | Material Retained on 20.0 mm Test Sieve (%): | 6                                              |
| Optimum Moisture Content (%): | 17                                |                                              |                                                |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                                |

| Checked By | Date          | Approved By | Date          |
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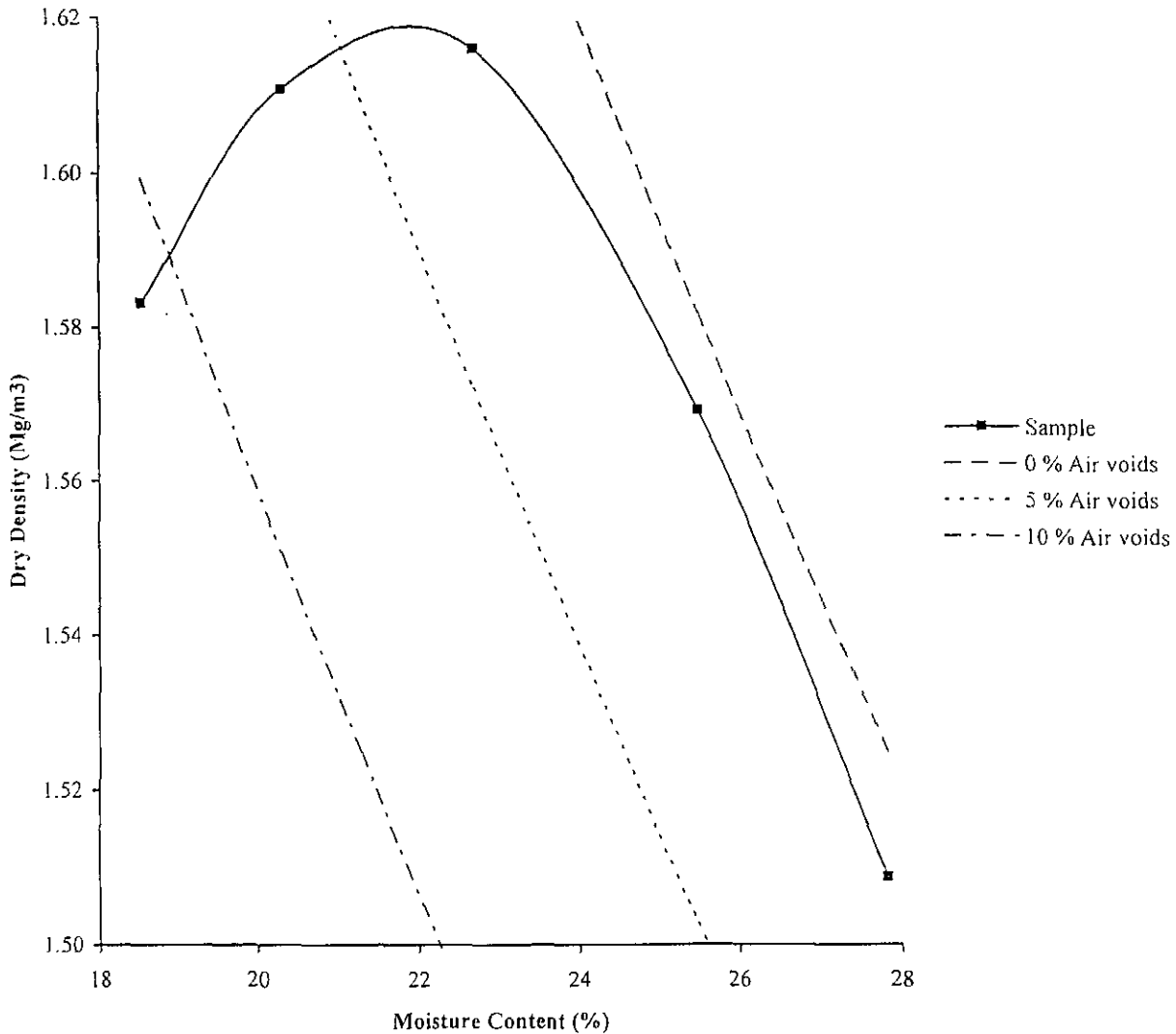


# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP19

Depth (m) : 2.00



|                               |                                   |                                              |                                                |
|-------------------------------|-----------------------------------|----------------------------------------------|------------------------------------------------|
| Initial Moisture Content:     | 19                                | Method of Compaction                         | 2.5Kg / Separate Sample                        |
| Particle Density (Mg/m3):     | 2.65                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): 0 |
| Maximum Dry Density (mg/m3):  | 1.62                              | Material Retained on 20.0 mm Test Sieve (%): | 3                                              |
| Optimum Moisture Content (%): | 22                                |                                              |                                                |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                                |

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

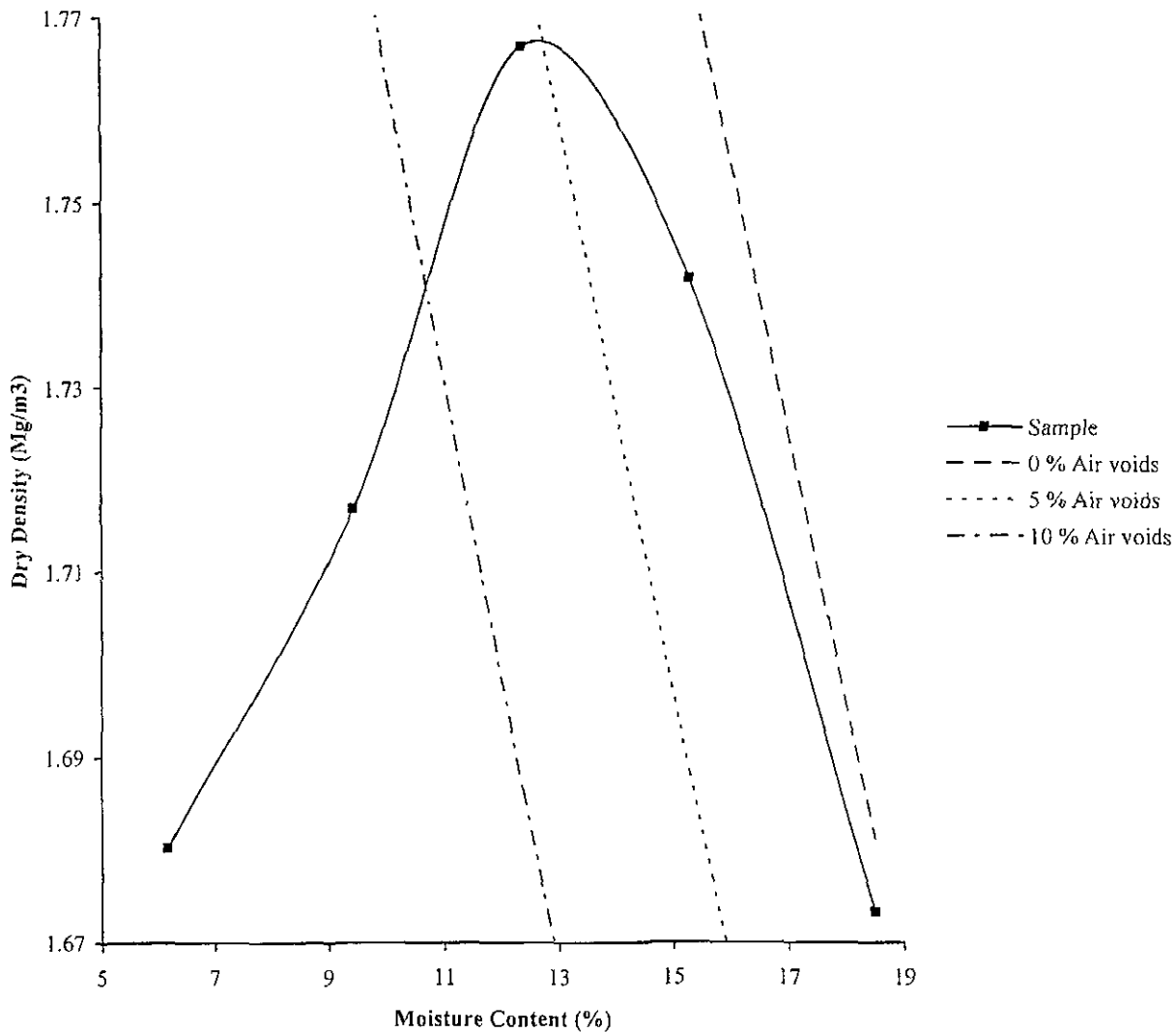
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP32

Depth (m) : 1.70



|                               |                                   |                                              |                                              |                 |
|-------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 12                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.44                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 6               |
| Maximum Dry Density (mg/m3):  | 1.77                              | Material Retained on 20.0 mm Test Sieve (%): | 3                                            |                 |
| Optimum Moisture Content (%): | 13                                |                                              |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 12/11/15 | <i>[Signature]</i> | 12/11/15 |



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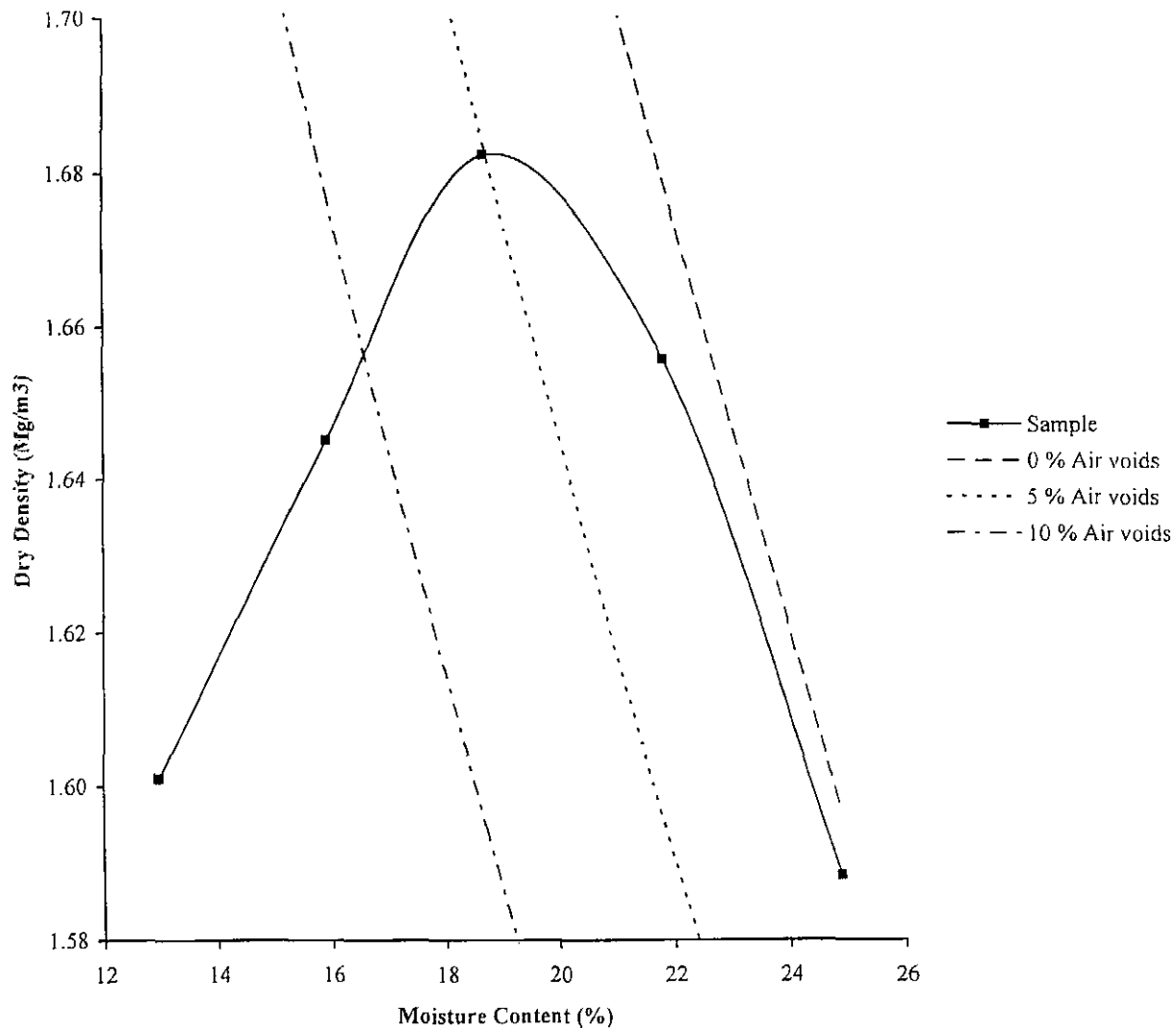
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP45

Depth (m) : 1.20



|                               |                                   |                      |                                              |                 |
|-------------------------------|-----------------------------------|----------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 22                                | Method of Compaction | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.65                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m3):  |                                   | 1.68                 | Material Retained on 20.0 mm Test Sieve (%): | 0               |
| Optimum Moisture Content (%): |                                   | 19                   |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                      |                                              |                 |

| Checked By | Date           | Approved By | Date           |
|------------|----------------|-------------|----------------|
| <i>RE</i>  | <i>5/12/05</i> | <i>RE</i>   | <i>5/12/05</i> |

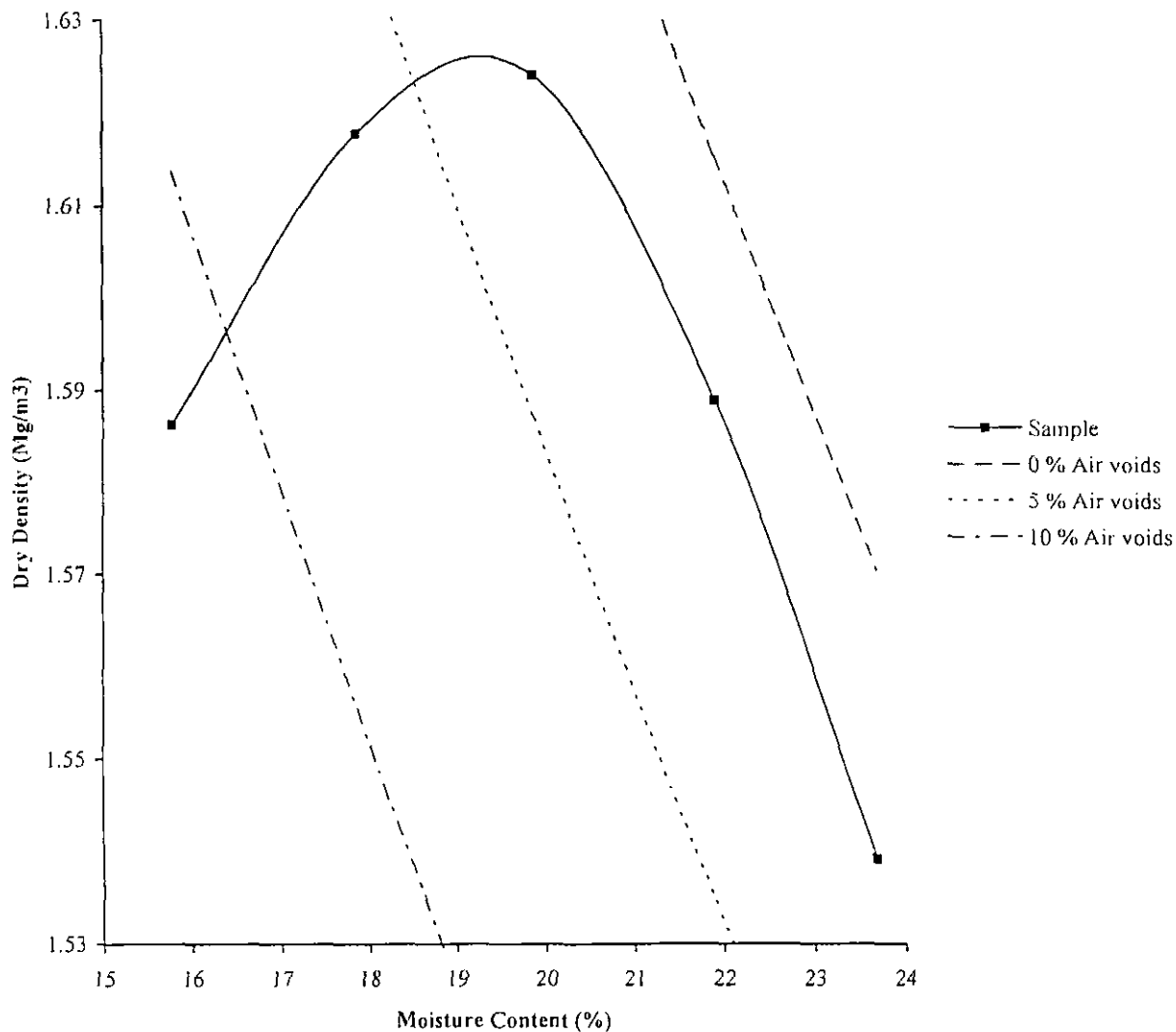
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP47

Depth (m) : 1.00



|                               |                                   |                      |                                                |
|-------------------------------|-----------------------------------|----------------------|------------------------------------------------|
| Initial Moisture Content:     | 14                                | Method of Compaction | 2.5Kg / Separate Sample                        |
| Particle Density (Mg/m³):     | 2.50                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): 6 |
| Maximum Dry Density (mg/m³):  | 1.62                              |                      | Material Retained on 20.0 mm Test Sieve (%): 4 |
| Optimum Moisture Content (%): | 19                                |                      |                                                |
| Remarks                       | See Summary of Soil Descriptions. |                      |                                                |

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

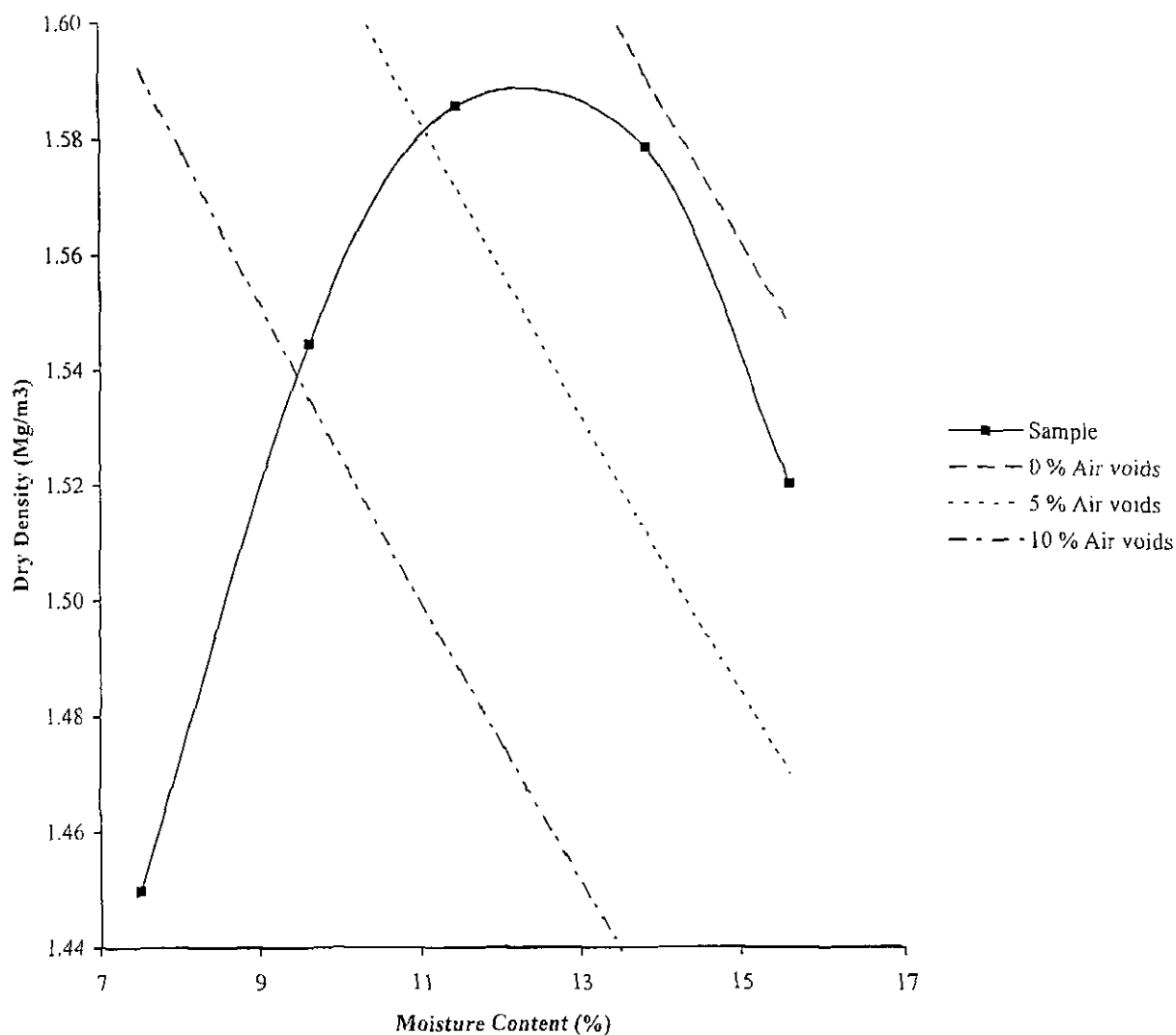
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# Dry Density/Moisture Content Relationship Test

Non Compliance with BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP48

Depth (m) : 2.00



|                                           |                                   |                      |                                                 |
|-------------------------------------------|-----------------------------------|----------------------|-------------------------------------------------|
| Initial Moisture Content:                 | 14                                | Method of Compaction | 2.5Kg / Separate Sample                         |
| Particle Density (Mg/m <sup>3</sup> ):    | 2.04                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): 12 |
| Maximum Dry Density (mg/m <sup>3</sup> ): | 1.59                              |                      | Material Retained on 20.0 mm Test Sieve (%): 14 |
| Optimum Moisture Content (%):             | 12                                |                      |                                                 |
| Remarks                                   | See Summary of Soil Descriptions. |                      |                                                 |

| Checked By | Date     | Approved By | Date     |
|------------|----------|-------------|----------|
|            | 12/12/15 |             | 12/12/15 |



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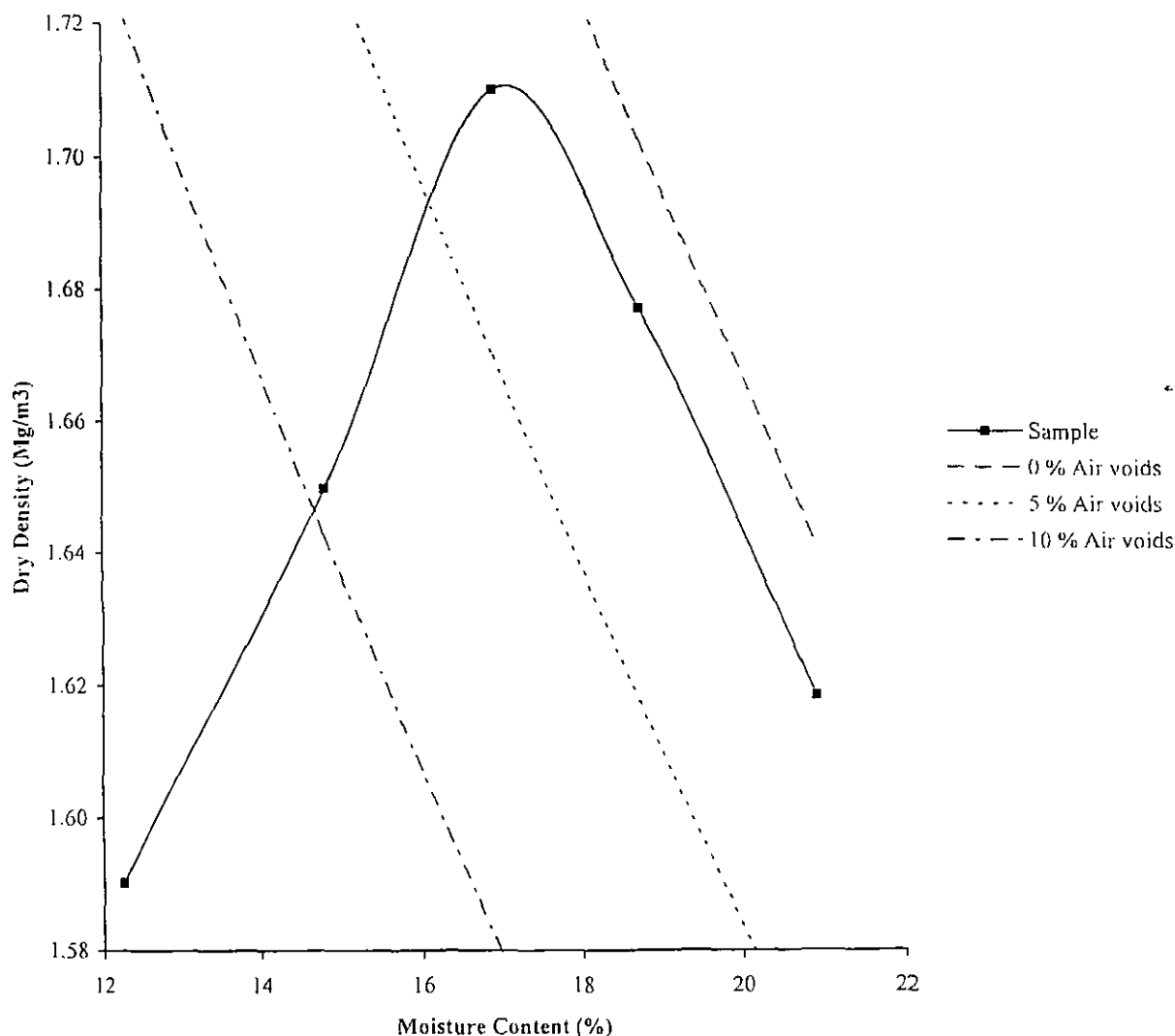
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PSL07/2659

# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP54

Depth (m) : 2.00



|                               |                                   |                                              |                                              |                 |
|-------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 15                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m³):     | 2.50                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m³):  | 1.71                              | Material Retained on 20.0 mm Test Sieve (%): | 7                                            |                 |
| Optimum Moisture Content (%): | 17                                |                                              |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 4/12/07 | <i>[Signature]</i> | 4/12/07 |

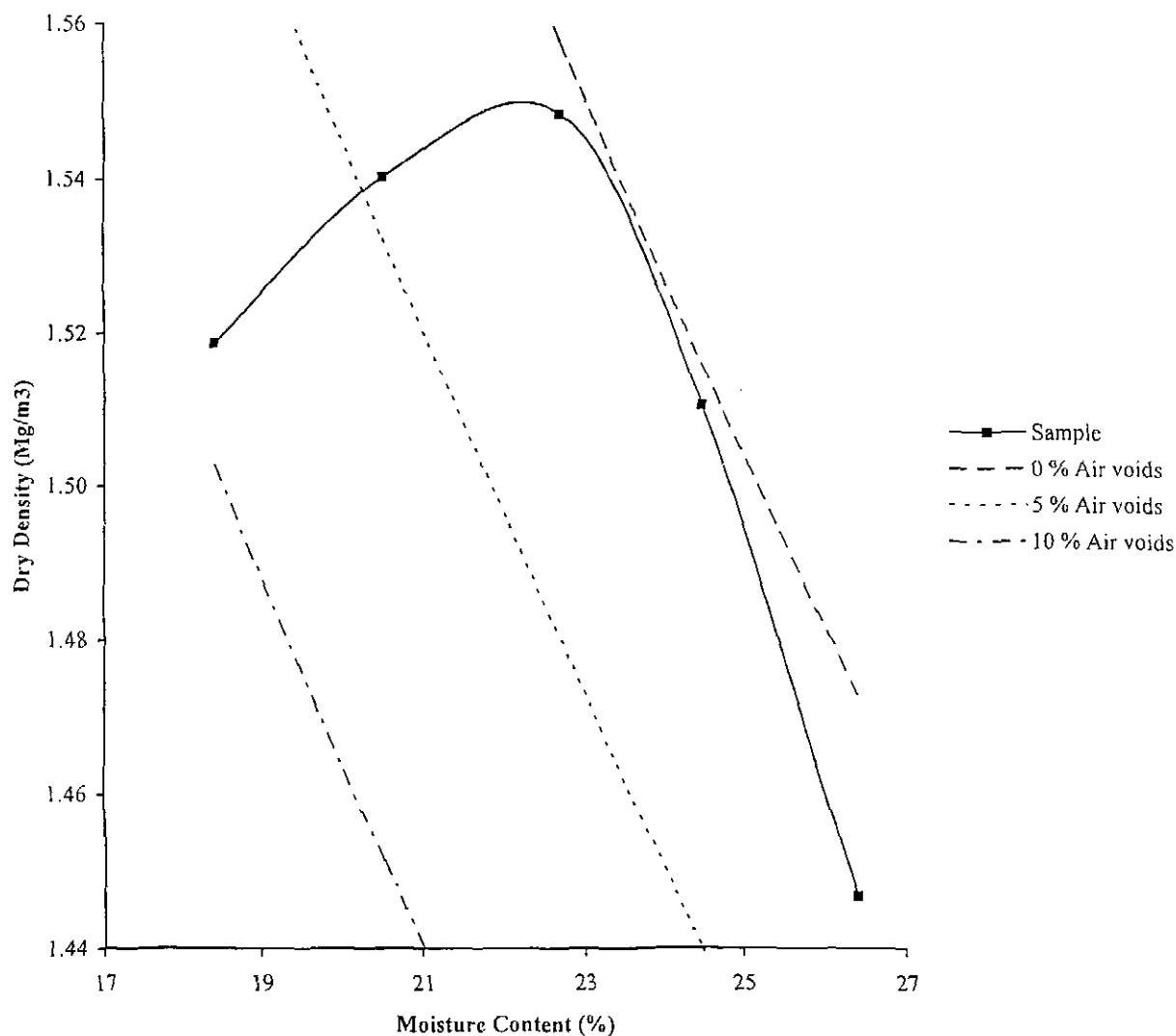
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP55

Depth (m) : 2.00



|                                           |                                   |                      |                                                |
|-------------------------------------------|-----------------------------------|----------------------|------------------------------------------------|
| Initial Moisture Content:                 | 16                                | Method of Compaction | 2.5Kg / Separate Sample                        |
| Particle Density (Mg/m <sup>3</sup> ):    | 2.41                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): 9 |
| Maximum Dry Density (mg/m <sup>3</sup> ): | 1.55                              |                      | Material Retained on 20.0 mm Test Sieve (%): 7 |
| Optimum Moisture Content (%):             | 22                                |                      |                                                |
| Remarks                                   | See Summary of Soil Descriptions. |                      |                                                |

| Checked By         | Date     | Approved By        | Date     |
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| <i>[Signature]</i> | 12/11/17 | <i>[Signature]</i> | 12/11/17 |



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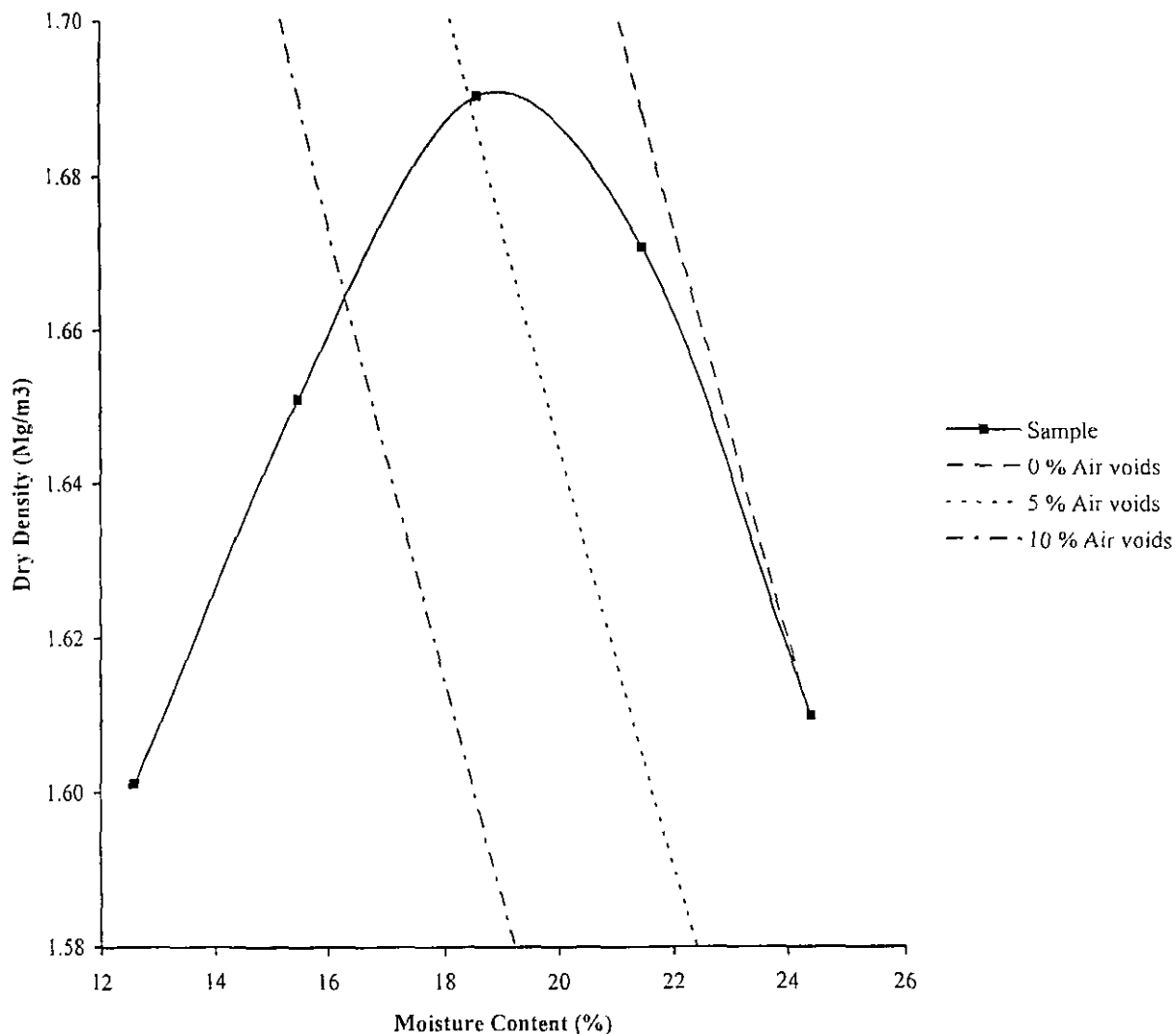
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP59

Depth (m) : 2.70



|                               |                                   |                                              |                                              |                 |
|-------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 24                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.65                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m3):  | 1.69                              | Material Retained on 20.0 mm Test Sieve (%): | 2                                            |                 |
| Optimum Moisture Content (%): | 19                                |                                              |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By | Date         | Approved By | Date         |
|------------|--------------|-------------|--------------|
| <i>KL</i>  | <i>shila</i> | <i>KL</i>   | <i>shila</i> |

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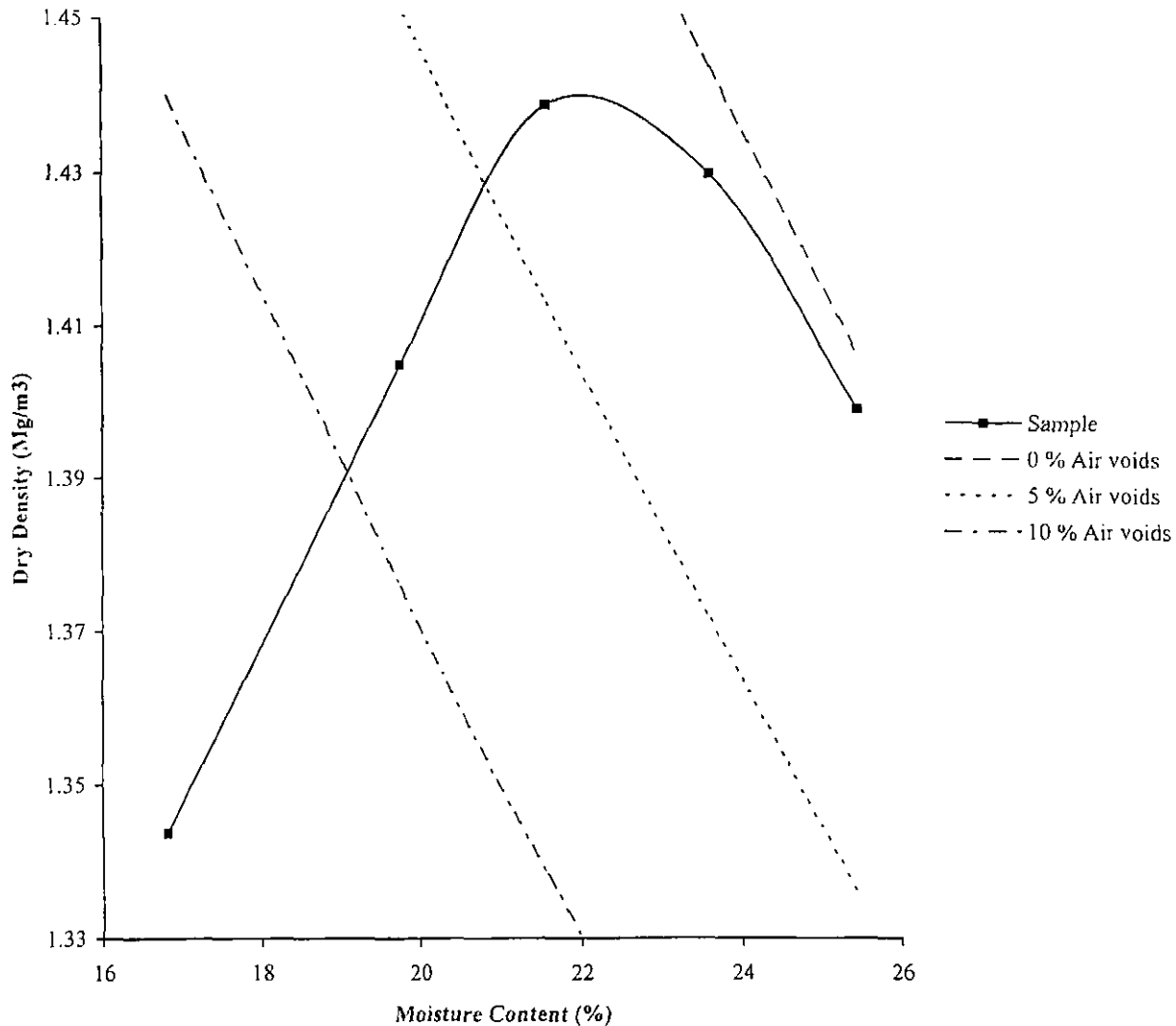


# Dry Density/Moisture Content Relationship Test

Non Compliance with BS 1377 : Part 4 : 1990

Trial Pit /Sample Number : TP76

Depth (m) : 0.50



|                                           |                                   |                                              |                                              |                 |
|-------------------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:                 | 20                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m <sup>3</sup> ):    | 2.19                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 20              |
| Maximum Dry Density (mg/m <sup>3</sup> ): | 1.44                              | Material Retained on 20.0 mm Test Sieve (%): | 5                                            |                 |
| Optimum Moisture Content (%):             | 22                                |                                              |                                              |                 |
| Remarks                                   | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By         | Date     | Approved By        | Date     |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 12/11/17 | <i>[Signature]</i> | 12/11/17 |

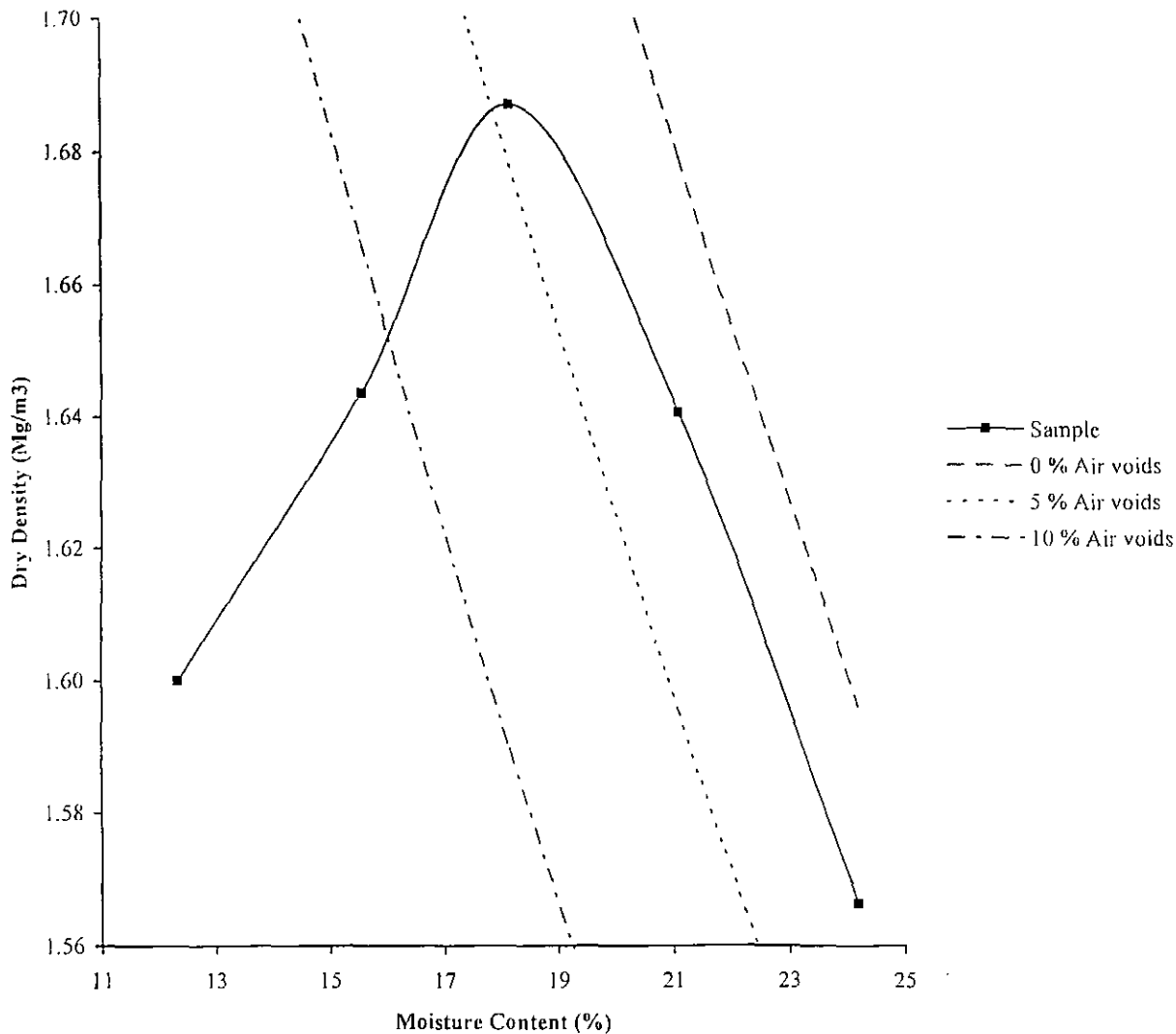
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Borehole /Sample Number : BH102

Depth (m) : 6.00-6.50



|                               |                                   |                                              |                                              |                 |
|-------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 18                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.60                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 3               |
| Maximum Dry Density (mg/m3):  | 1.69                              | Material Retained on 20.0 mm Test Sieve (%): | 5                                            |                 |
| Optimum Moisture Content (%): | 18                                |                                              |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |



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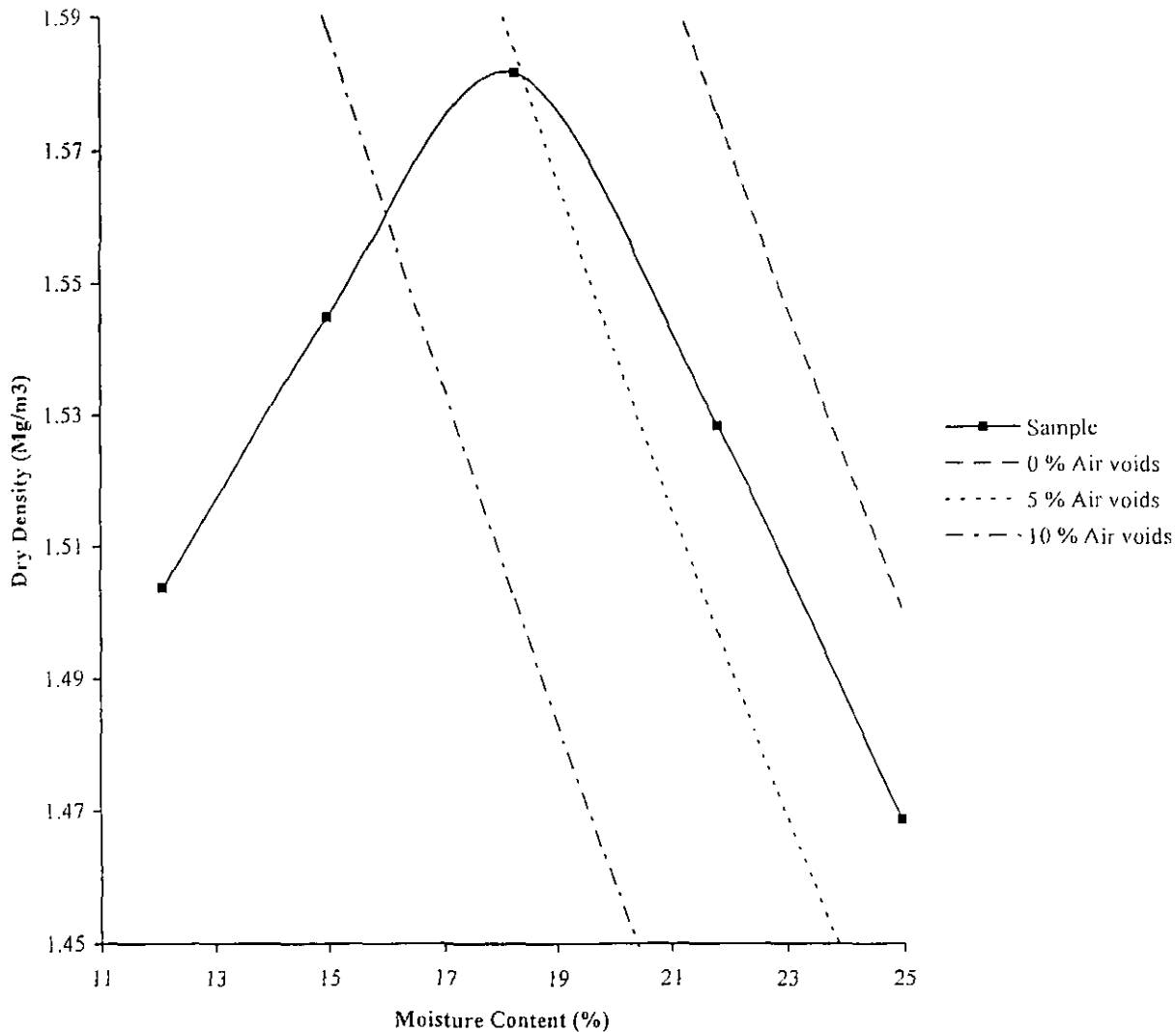
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Borehole /Sample Number : BH103

Depth (m) : 1.50-3.00



|                               |                                   |                      |                                              |                 |
|-------------------------------|-----------------------------------|----------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 22                                | Method of Compaction | 4.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.40                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m3):  | 1.58                              |                      | Material Retained on 20.0 mm Test Sieve (%): | 4               |
| Optimum Moisture Content (%): | 18                                |                      |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                      |                                              |                 |

| Checked By         | Date   | Approved By        | Date   |
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| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

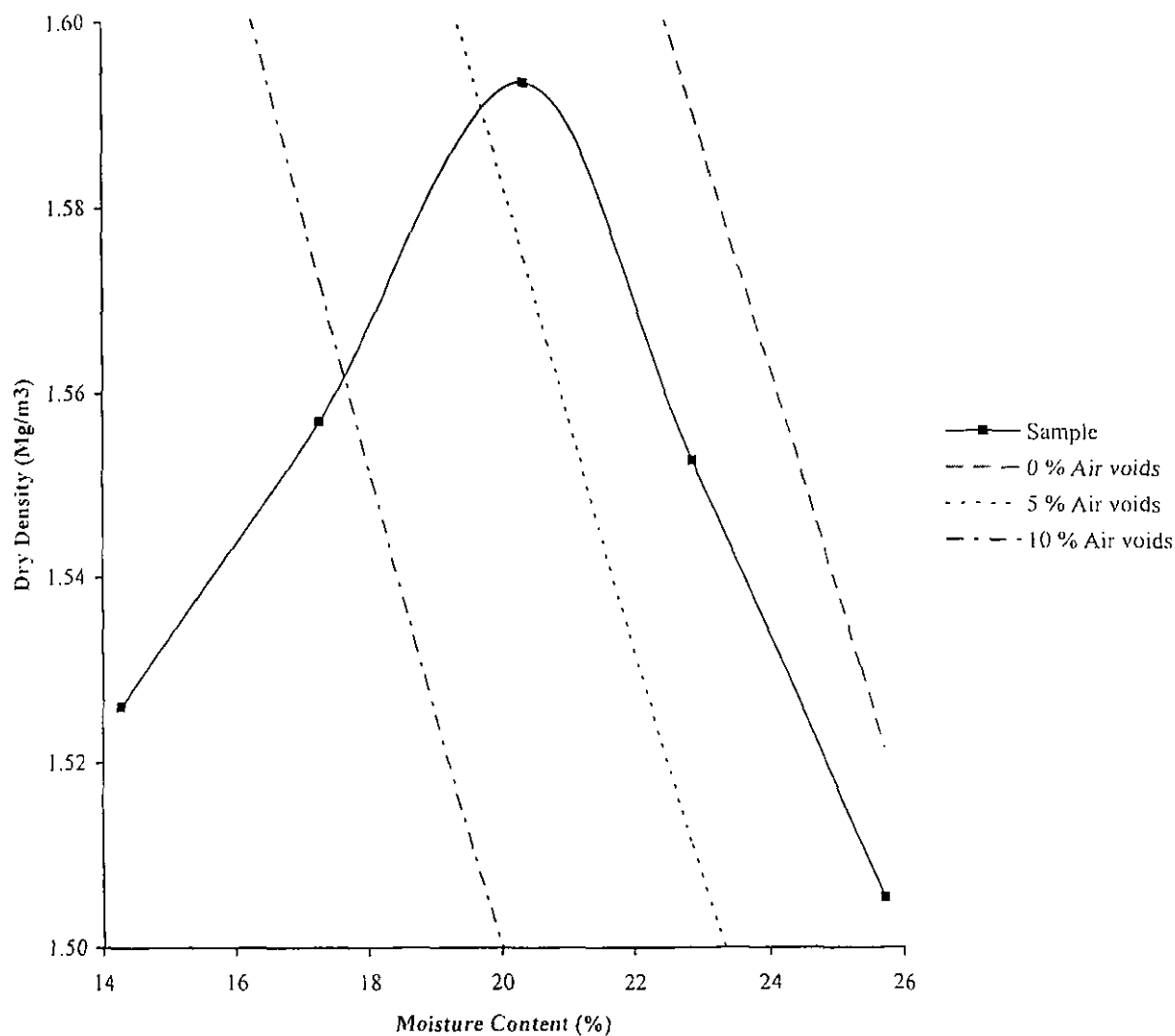
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Borehole /Sample Number : BH110

Depth (m) : 1.80-3.20



|                               |                                   |                      |                                              |                 |
|-------------------------------|-----------------------------------|----------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 20                                | Method of Compaction | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m3):     | 2.50                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m3):  |                                   | 1.59                 | Material Retained on 20.0 mm Test Sieve (%): | 4               |
| Optimum Moisture Content (%): |                                   | 20                   |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                      |                                              |                 |

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

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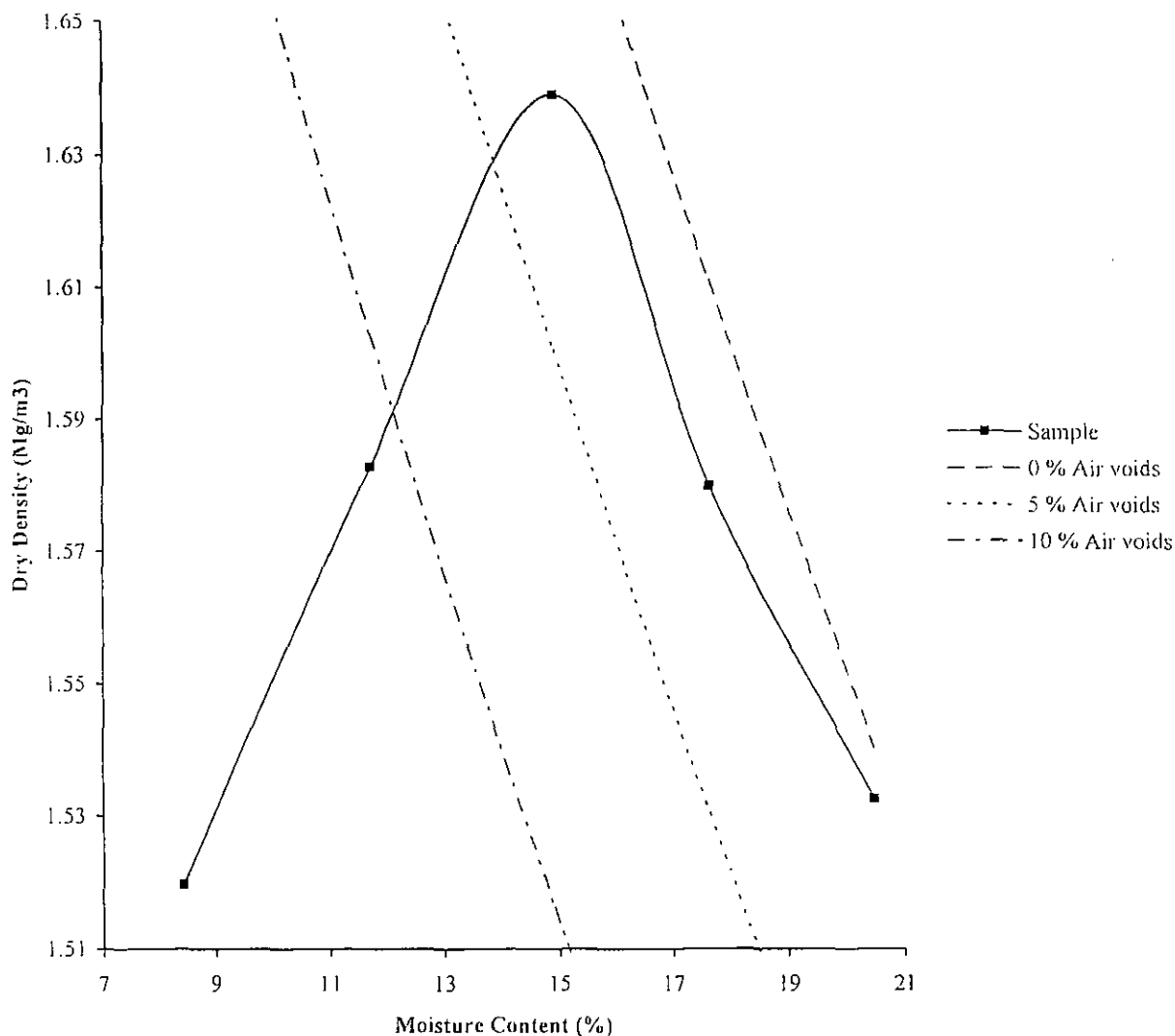
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Borehole /Sample Number : BH115

Depth (m) : 4.50-6.00



|                               |                                   |                                              |                                              |                 |
|-------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 20                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m³):     | 2.25                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 0               |
| Maximum Dry Density (mg/m³):  | 1.64                              | Material Retained on 20.0 mm Test Sieve (%): | 5                                            |                 |
| Optimum Moisture Content (%): | 15                                |                                              |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

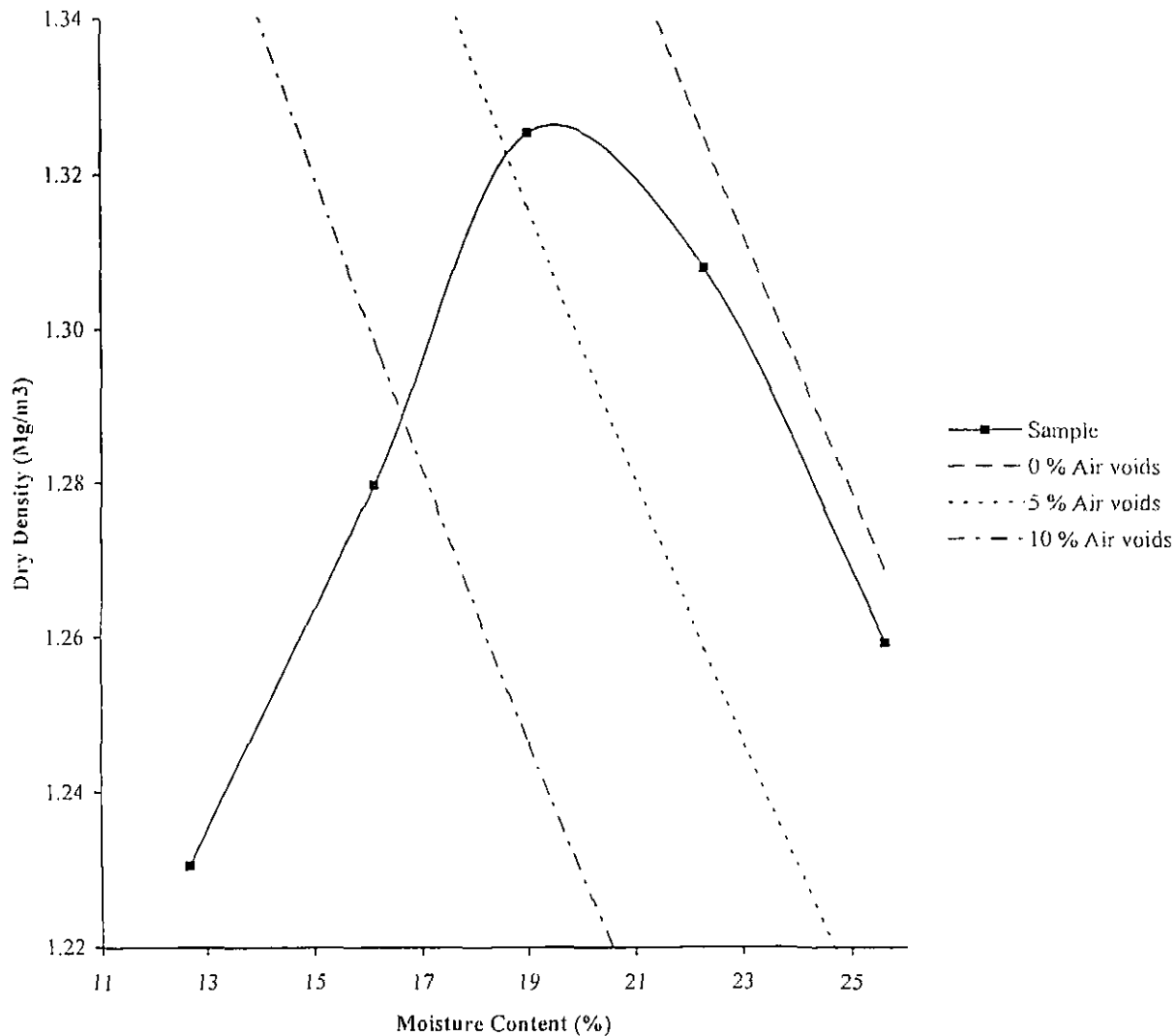
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Borehole /Sample Number : BH117

Depth (m) : 3.00-4.30



|                                           |                                   |                      |                                                |
|-------------------------------------------|-----------------------------------|----------------------|------------------------------------------------|
| Initial Moisture Content:                 | 29                                | Method of Compaction | 2.5Kg / Separate Sample                        |
| Particle Density (Mg/m <sup>3</sup> ):    | 1.88                              | Assumed              | Material Retained on 37.5 mm Test Sieve (%): 0 |
| Maximum Dry Density (mg/m <sup>3</sup> ): | 1.33                              |                      | Material Retained on 20.0 mm Test Sieve (%): 2 |
| Optimum Moisture Content (%):             | 20                                |                      |                                                |
| Remarks                                   | See Summary of Soil Descriptions. |                      |                                                |

| Checked By         | Date   | Approved By        | Date   |
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| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

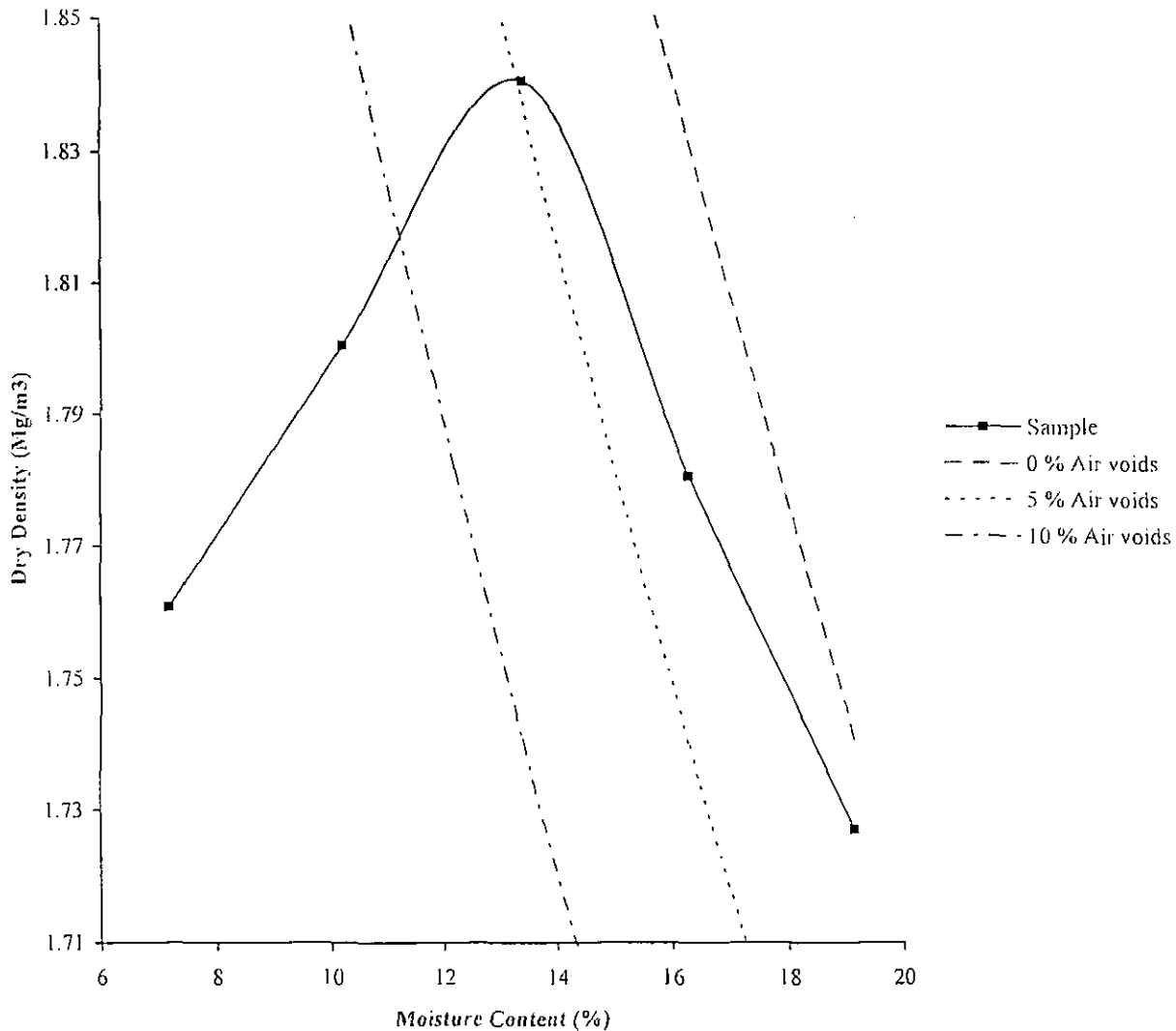
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Borehole /Sample Number : BH118

Depth (m) : GL - 1.50



|                               |                                   |                                              |                                              |                 |
|-------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------|-----------------|
| Initial Moisture Content:     | 19                                | Method of Compaction                         | 2.5Kg /                                      | Separate Sample |
| Particle Density (Mg/m³):     | 2.61                              | Assumed                                      | Material Retained on 37.5 mm Test Sieve (%): | 4               |
| Maximum Dry Density (mg/m³):  | 1.84                              | Material Retained on 20.0 mm Test Sieve (%): | 7                                            |                 |
| Optimum Moisture Content (%): | 13                                |                                              |                                              |                 |
| Remarks                       | See Summary of Soil Descriptions. |                                              |                                              |                 |

| Checked By         | Date   | Approved By        | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

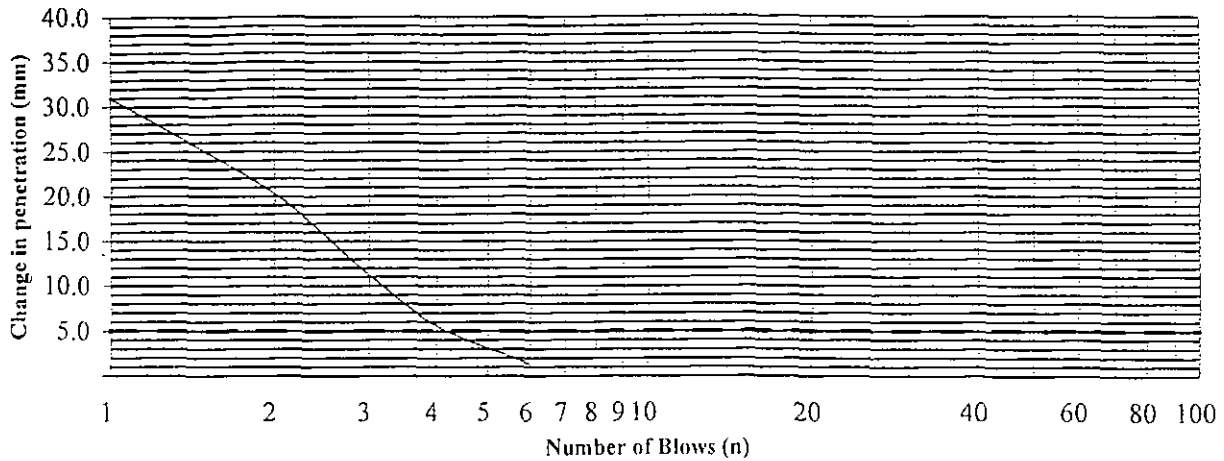
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# MOISTURE CONDITION VALUE BS1377 : Part 4 : 1990.

Trial Pit /Sample No      TP8                      Depth (m):                      1.80

|                                                  |   |
|--------------------------------------------------|---|
| Material Retained on the 20mm BS Test Sieve (%): | 4 |
|--------------------------------------------------|---|

## MCV Determination



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 114.0               | 31.0             |
| 2            | 97.9                | 20.3             |
| 3            | 88.6                | 11.2             |
| 4            | 83.0                | 5.6              |
| 6            | 78.4                | 1.3              |
| 8            | 77.6                |                  |
| 12           | 77.4                |                  |
| 16           | 77.4                |                  |
| 24           | 77.1                |                  |
| 32           |                     |                  |
| 48           |                     |                  |
| 64           |                     |                  |
| 96           |                     |                  |
| 128          |                     |                  |
| 192          |                     |                  |
| 256          |                     |                  |

### Test Results.

|                       |      |
|-----------------------|------|
| Moisture Content (%). | 20.1 |
| MCV                   | 6.2  |

| Checked | Date     | Approved | Date     |
|---------|----------|----------|----------|
|         | 11/12/15 |          | 11/12/15 |



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Contract No.:  
PSL07/2659



# **MOISTURE CONDITION VALUE** **BS1377 : Part 4 : 1990.**

Trial Pit /Sample No

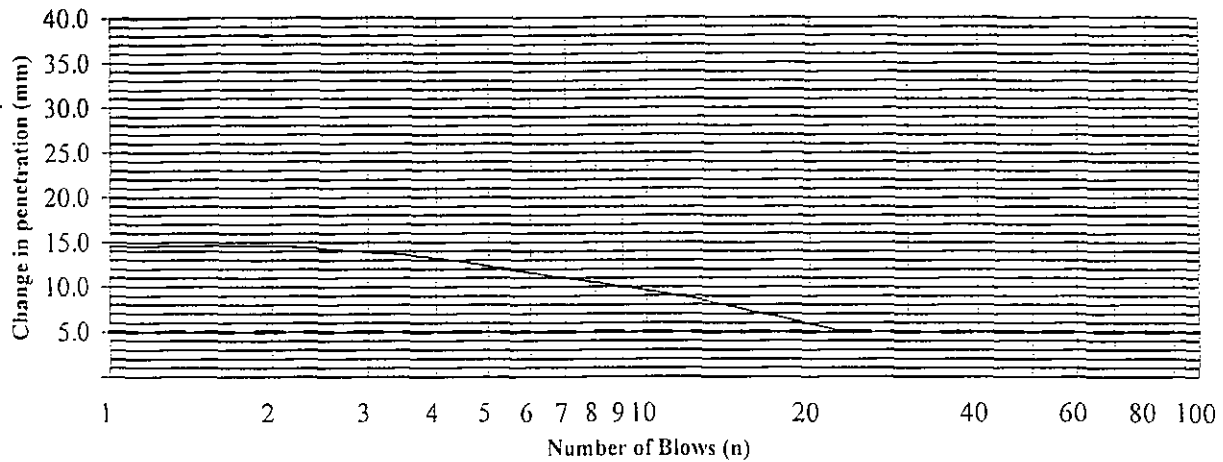
TP20

Depth (m):

2.50

|                                                  |    |
|--------------------------------------------------|----|
| Material Retained on the 20mm BS Test Sieve (%): | 19 |
|--------------------------------------------------|----|

## **MCV Determination**



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 99.1                | 14.5             |
| 2            | 92.0                | 14.6             |
| 3            | 87.7                | 13.9             |
| 4            | 84.6                | 13.2             |
| 6            | 80.2                | 11.6             |
| 8            | 77.4                | 10.5             |
| 12           | 73.8                | 8.8              |
| 16           | 71.4                | 7.2              |
| 24           | 68.6                | 4.8              |
| 32           | 66.9                |                  |
| 48           | 65.0                |                  |
| 64           | 64.2                |                  |
| 96           | 63.8                |                  |
| 128          |                     |                  |
| 192          |                     |                  |
| 256          |                     |                  |

## **Test Results.**

|                       |      |
|-----------------------|------|
| Moisture Content (%). | 15.4 |
| MCV                   | 13.6 |

| Checked | Date     | Approved | Date     |
|---------|----------|----------|----------|
|         | 11/12/15 |          | 11/12/15 |



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Contract No.:  
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# **MOISTURE CONDITION VALUE** **BS1377 : Part 4 : 1990.**

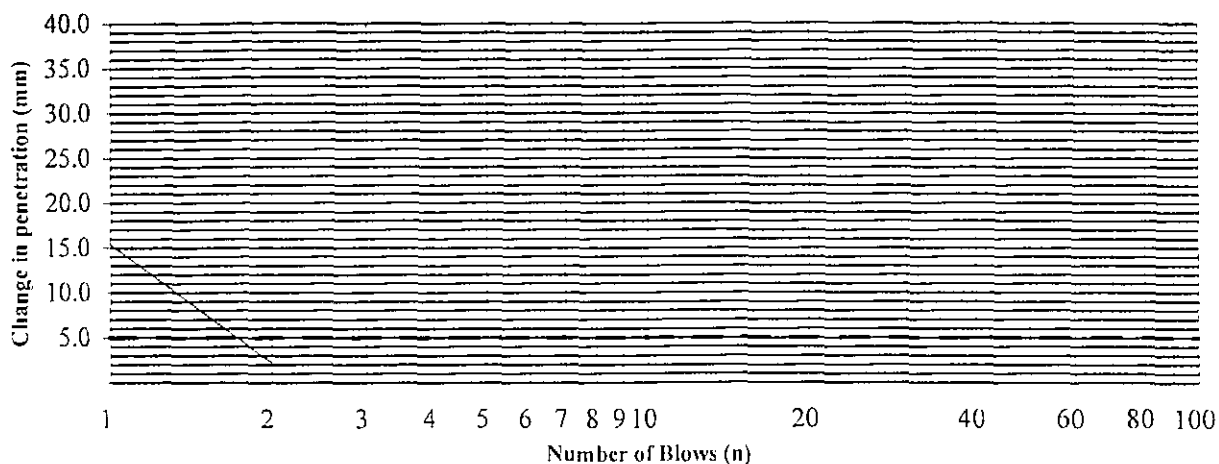
Trial Pit /Sample No      TP29

Depth (m):

3.50

|                                                 |   |
|-------------------------------------------------|---|
| Material Retained on the 20mm BS Test Sieve (%) | 0 |
|-------------------------------------------------|---|

## **MCV Determination**



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 114.2               | 15.4             |
| 2            | 99.5                | 2.2              |
| 3            | 99.1                |                  |
| 4            | 98.8                |                  |
| 6            | 97.7                |                  |
| 8            | 97.3                |                  |
| 12           |                     |                  |
| 16           |                     |                  |
| 24           |                     |                  |
| 32           |                     |                  |
| 48           |                     |                  |
| 64           |                     |                  |
| 96           |                     |                  |
| 128          |                     |                  |
| 192          |                     |                  |
| 256          |                     |                  |

## Test Results.

|                      |      |
|----------------------|------|
| Moisture Content (%) | 32.5 |
| MCV                  | 2.3  |

| Checked   | Date    | Approved  | Date    |
|-----------|---------|-----------|---------|
| <i>RQ</i> | 5/12/17 | <i>RQ</i> | 5/12/17 |

|                                             |                        |                             |
|---------------------------------------------|------------------------|-----------------------------|
| <b>PSL</b><br>Professional Soils Laboratory | NORTH GAWBER COLLIERY. | Contract No.:<br>PSL07/2659 |
|---------------------------------------------|------------------------|-----------------------------|

# MOISTURE CONDITION VALUE BS1377 : Part 4 : 1990.

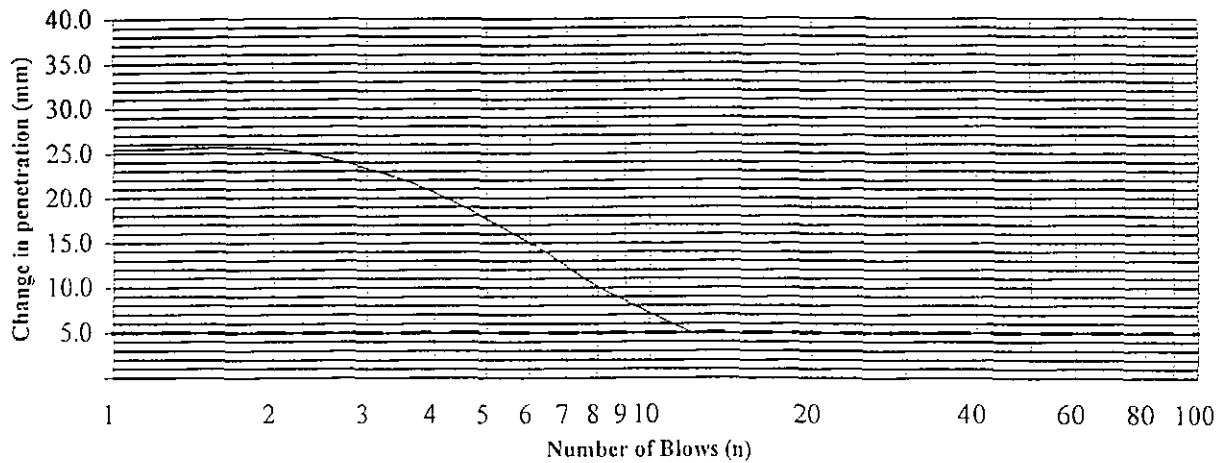
Trial Pit /Sample No      TP35

Depth (m):

1.00

|                                                  |   |
|--------------------------------------------------|---|
| Material Retained on the 20mm BS Test Sieve (%): | 3 |
|--------------------------------------------------|---|

## MCV Determination



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 117.8               | 25.4             |
| 2            | 105.4               | 25.5             |
| 3            | 97.8                | 23.3             |
| 4            | 92.4                | 20.6             |
| 6            | 85.0                | 15.0             |
| 8            | 79.9                | 10.1             |
| 12           | 74.5                | 4.9              |
| 16           | 71.8                |                  |
| 24           | 70.0                |                  |
| 32           | 69.8                |                  |
| 48           | 69.6                |                  |
| 64           |                     |                  |
| 96           |                     |                  |
| 128          |                     |                  |
| 192          |                     |                  |
| 256          |                     |                  |

### Test Results.

|                       |      |
|-----------------------|------|
| Moisture Content (%). | 12.4 |
| MCV                   | 10.7 |

| Checked | Date     | Approved | Date     |
|---------|----------|----------|----------|
|         | 12/12/12 |          | 12/12/12 |



NORTH GAWBER COLLIERY.

Contract No.:  
PSL07/2659

# MOISTURE CONDITION VALUE BS1377 : Part 4 : 1990.

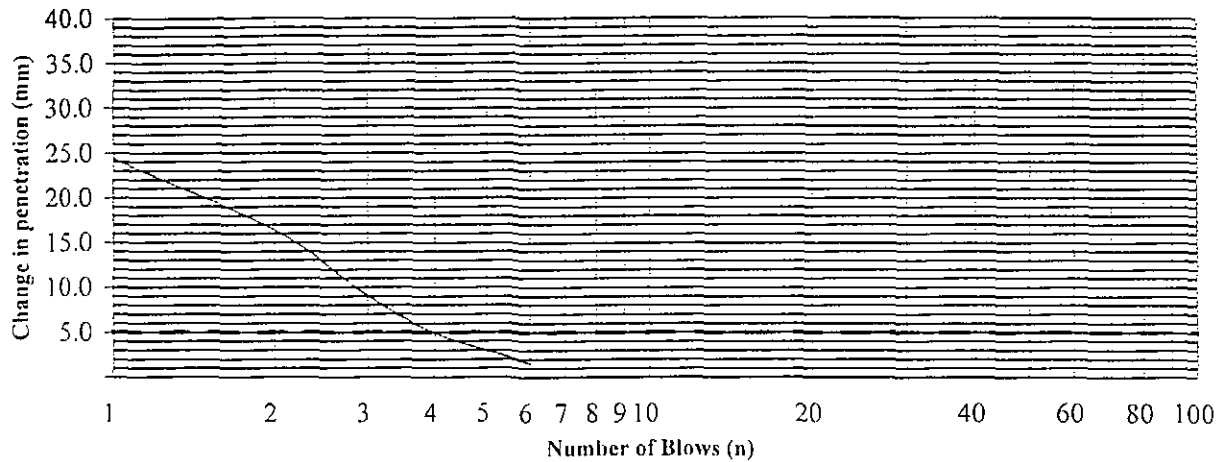
Trial Pit /Sample No TP55

Depth (m):

3.50

|                                                  |   |
|--------------------------------------------------|---|
| Material Retained on the 20mm BS Test Sieve (%): | 0 |
|--------------------------------------------------|---|

## MCV Determination



| Blows (N) | Penetration (mm) | n to 4 n (mm) |
|-----------|------------------|---------------|
| 1         | 100.5            | 24.4          |
| 2         | 88.4             | 16.4          |
| 3         | 80.6             | 9.1           |
| 4         | 76.1             | 4.9           |
| 6         | 72.4             | 1.5           |
| 8         | 72.0             |               |
| 12        | 71.5             |               |
| 16        | 71.2             |               |
| 24        | 70.9             |               |
| 32        |                  |               |
| 48        |                  |               |
| 64        |                  |               |
| 96        |                  |               |
| 128       |                  |               |
| 192       |                  |               |
| 256       |                  |               |

## Test Results.

|                      |      |
|----------------------|------|
| Moisture Content (%) | 24.3 |
| MCV                  | 6.0  |

| Checked   | Date    | Approved  | Date    |
|-----------|---------|-----------|---------|
| <i>RE</i> | 5/12/04 | <i>RE</i> | 5/12/04 |



NORTH GAWBER COLLIERY.

Contract No.:  
PSL07/2659

# MOISTURE CONDITION VALUE BS1377 : Part 4 : 1990.

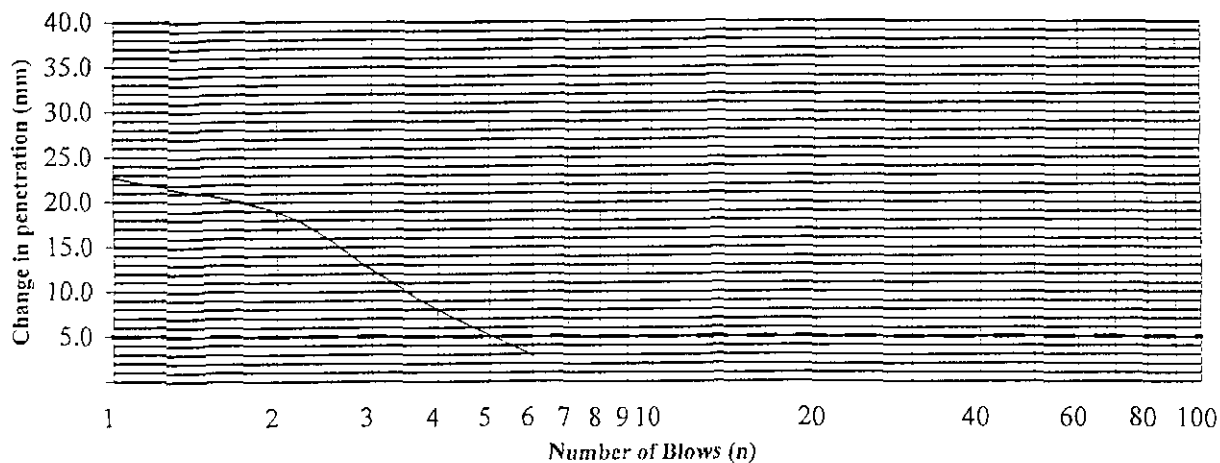
Trial Pit /Sample No      TP70

Depth (m):

3.50

|                                                  |   |
|--------------------------------------------------|---|
| Material Retained on the 20mm BS Test Sieve (%): | 0 |
|--------------------------------------------------|---|

## MCV Determination



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 109.5               | 22.7             |
| 2            | 98.3                | 18.9             |
| 3            | 91.3                | 12.4             |
| 4            | 86.8                | 8.0              |
| 6            | 81.3                | 2.9              |
| 8            | 79.4                |                  |
| 12           | 78.9                |                  |
| 16           | 78.8                |                  |
| 24           | 78.4                |                  |
| 32           |                     |                  |
| 48           |                     |                  |
| 64           |                     |                  |
| 96           |                     |                  |
| 128          |                     |                  |
| 192          |                     |                  |
| 256          |                     |                  |

### Test Results.

|                      |      |
|----------------------|------|
| Moisture Content (%) | 28.3 |
| MCV                  | 7.0  |

| Checked   | Date          | Approved  | Date          |
|-----------|---------------|-----------|---------------|
| <i>RE</i> | <i>stelen</i> | <i>RE</i> | <i>stelen</i> |



NORTH GAWBER COLLIERY.

Contract No.:  
PSL07/2659

# MOISTURE CONDITION VALUE BS1377 : Part 4 : 1990.

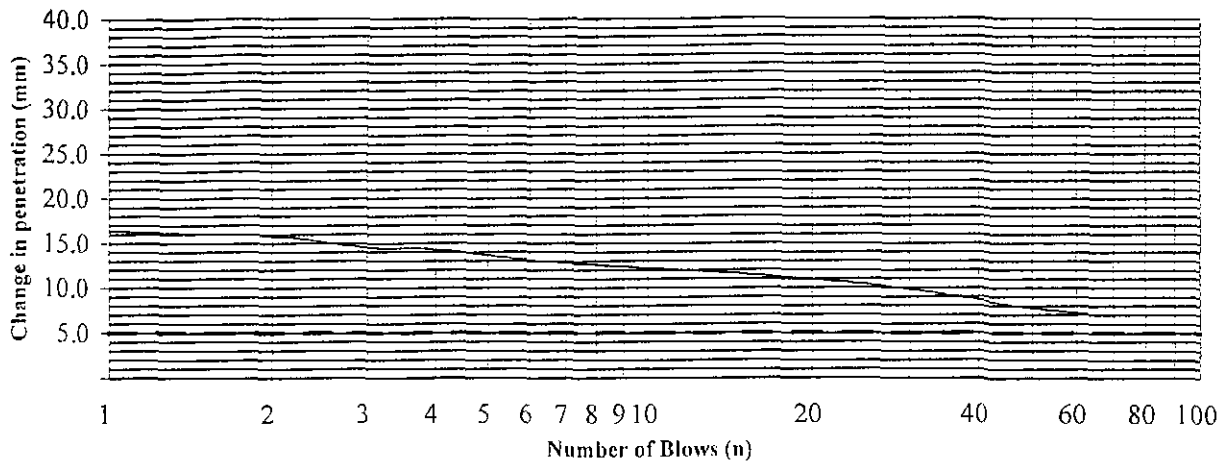
Trial Pit /Sample No      TP73

Depth (m):

1.00

|                                                  |    |
|--------------------------------------------------|----|
| Material Retained on the 20mm BS Test Sieve (%): | 27 |
|--------------------------------------------------|----|

## MCV Determination



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 125.4               | 16.4             |
| 2            | 117.2               | 15.8             |
| 3            | 111.7               | 14.5             |
| 4            | 109.0               | 14.3             |
| 6            | 104.3               | 13.1             |
| 8            | 101.4               | 12.6             |
| 12           | 97.2                | 11.9             |
| 16           | 94.7                | 11.4             |
| 24           | 91.2                | 10.5             |
| 32           | 88.8                | 9.6              |
| 48           | 85.3                | 7.9              |
| 64           | 83.3                | 7.1              |
| 96           | 80.7                |                  |
| 128          | 79.2                |                  |
| 192          | 77.4                |                  |
| 256          | 76.2                |                  |

### Test Results.

|                       |      |
|-----------------------|------|
| Moisture Content (%). | 19.6 |
| MCV                   | >14  |

| Checked | Date     | Approved | Date     |
|---------|----------|----------|----------|
|         | 12/12/15 |          | 12/12/15 |



NORTH GAWBER COLLIERY.

Contract No.:  
PSL07/2659

# MOISTURE CONDITION VALUE BS1377 : Part 4 : 1990.

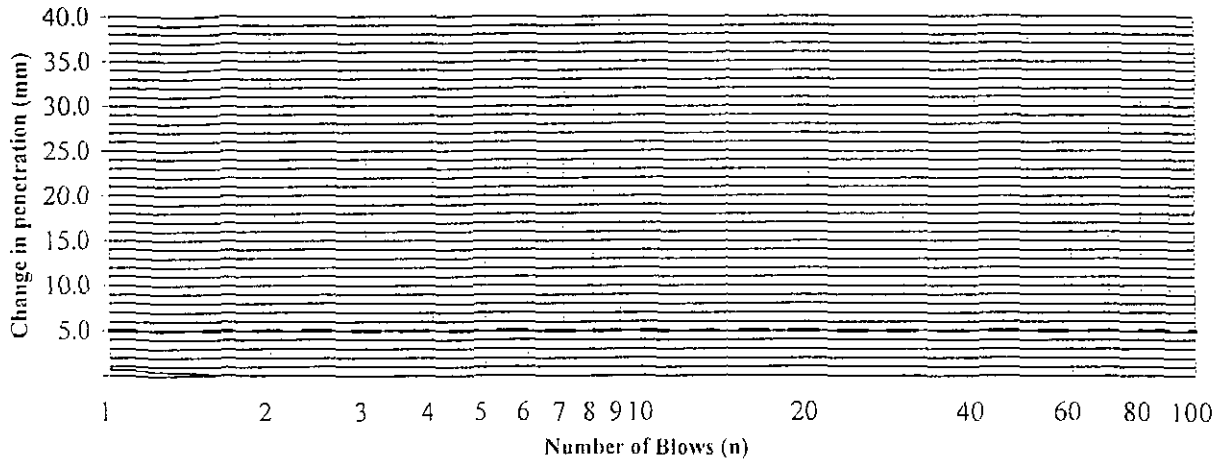
Borehole /Sample No   BH105

Depth (m):

1.00-1.50

|                                                   |    |
|---------------------------------------------------|----|
| Material Retained on the 20mm BS Test Sieve (%).. | 10 |
|---------------------------------------------------|----|

## MCV Determination



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 88.4                | 0.7              |
| 2            | 87.9                |                  |
| 3            | 87.8                |                  |
| 4            | 87.7                |                  |
| 6            |                     |                  |
| 8            |                     |                  |
| 12           |                     |                  |
| 16           |                     |                  |
| 24           |                     |                  |
| 32           |                     |                  |
| 48           |                     |                  |
| 64           |                     |                  |
| 96           |                     |                  |
| 128          |                     |                  |
| 192          |                     |                  |
| 256          |                     |                  |

### Test Results.

|                        |      |
|------------------------|------|
| Moisture Content (%).. | 27.4 |
| MCV                    | 0.0  |

| Checked            | Date   | Approved           | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

|                                             |                       |                             |
|---------------------------------------------|-----------------------|-----------------------------|
| <b>PSL</b><br>Professional Soils Laboratory | SHRUBHILL, EDINBURGH. | Contract No.:<br>PSL07/2904 |
|---------------------------------------------|-----------------------|-----------------------------|

# MOISTURE CONDITION VALUE BS1377 : Part 4 : 1990.

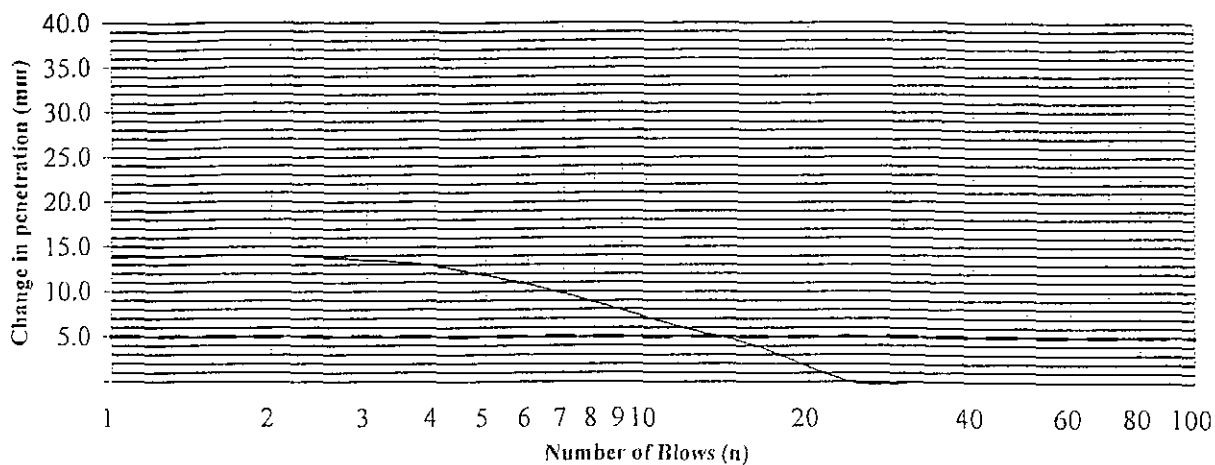
Borehole /Sample No    **BH105**

Depth (m):

**4.00-4.50**

|                                                  |          |
|--------------------------------------------------|----------|
| Material Retained on the 20mm BS Test Sieve (%): | <b>8</b> |
|--------------------------------------------------|----------|

## MCV Determination



| Blows<br>(N) | Penetration<br>(mm) | n to 4 n<br>(mm) |
|--------------|---------------------|------------------|
| 1            | 115.0               | 13.8             |
| 2            | 108.2               | 14.0             |
| 3            | 104.1               | 13.5             |
| 4            | 101.2               | 12.9             |
| 6            | 97.0                | 10.8             |
| 8            | 94.2                | 8.8              |
| 12           | 90.6                | 5.8              |
| 16           | 88.3                | 4.0              |
| 24           | 86.2                |                  |
| 32           | 85.4                |                  |
| 48           | 84.8                |                  |
| 64           | 84.3                |                  |
| 96           |                     |                  |
| 128          |                     |                  |
| 192          |                     |                  |
| 256          |                     |                  |

### Test Results.

|                      |      |
|----------------------|------|
| Moisture Content (%) | 28.5 |
| MCV                  | 11.5 |

| Checked            | Date   | Approved           | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |



SHRUBHILL, EDINBURGH.

Contract No.:  
PSL07/2904



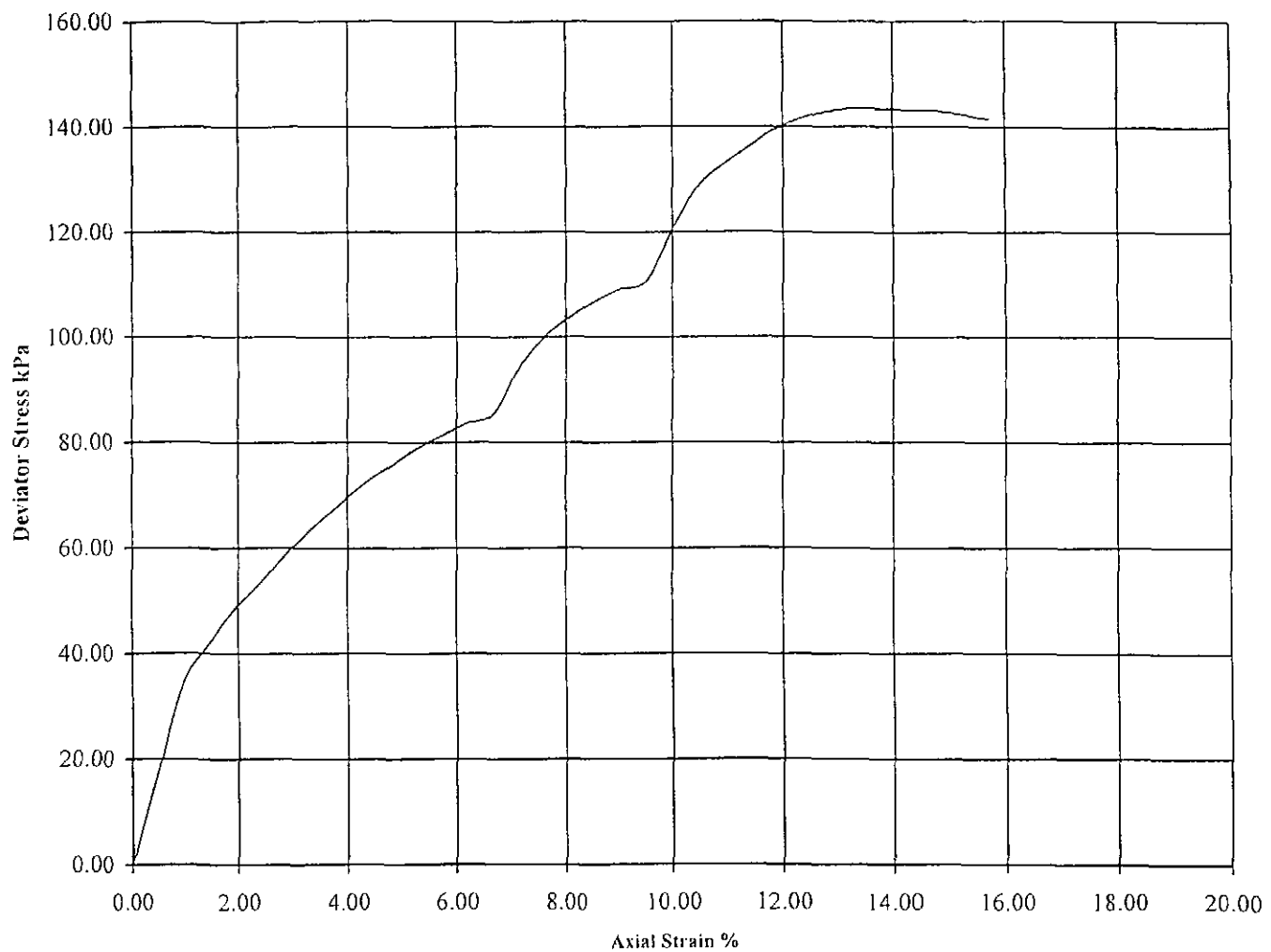
# Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

B.S. 1377 : Part 7 : Clause 9 : 1990

Borehole / Sample Number: BH102

Depth (m): 10.00-10.40



| Diameter (mm): |                      | Height (mm):                      |                                  | Test:               |                       | 100mm Multistage |                    |                 | Remarks<br>See summary of soil descriptions. |
|----------------|----------------------|-----------------------------------|----------------------------------|---------------------|-----------------------|------------------|--------------------|-----------------|----------------------------------------------|
| Specimen       | Moisture Content (%) | Bulk Density (Mg/m <sup>3</sup> ) | Dry Density (Mg/m <sup>3</sup> ) | Cell Pressure (kPa) | Deviator Stress (kPa) | Cohesion (kPa)   | Failure Strain (%) | Mode of Failure |                                              |
| A              | 27                   | 1.94                              | 1.53                             | 200                 | 85                    | 43               | 6.7                | Plastic         |                                              |
|                |                      |                                   |                                  | 400                 | 111                   | 55               | 9.5                |                 |                                              |
|                |                      |                                   |                                  | 800                 | 144                   | 72               | 13.3               |                 |                                              |

| Checked            | Date   | Approved           | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |



NORTH GAWBER.

Contract No:  
PSL07/2904

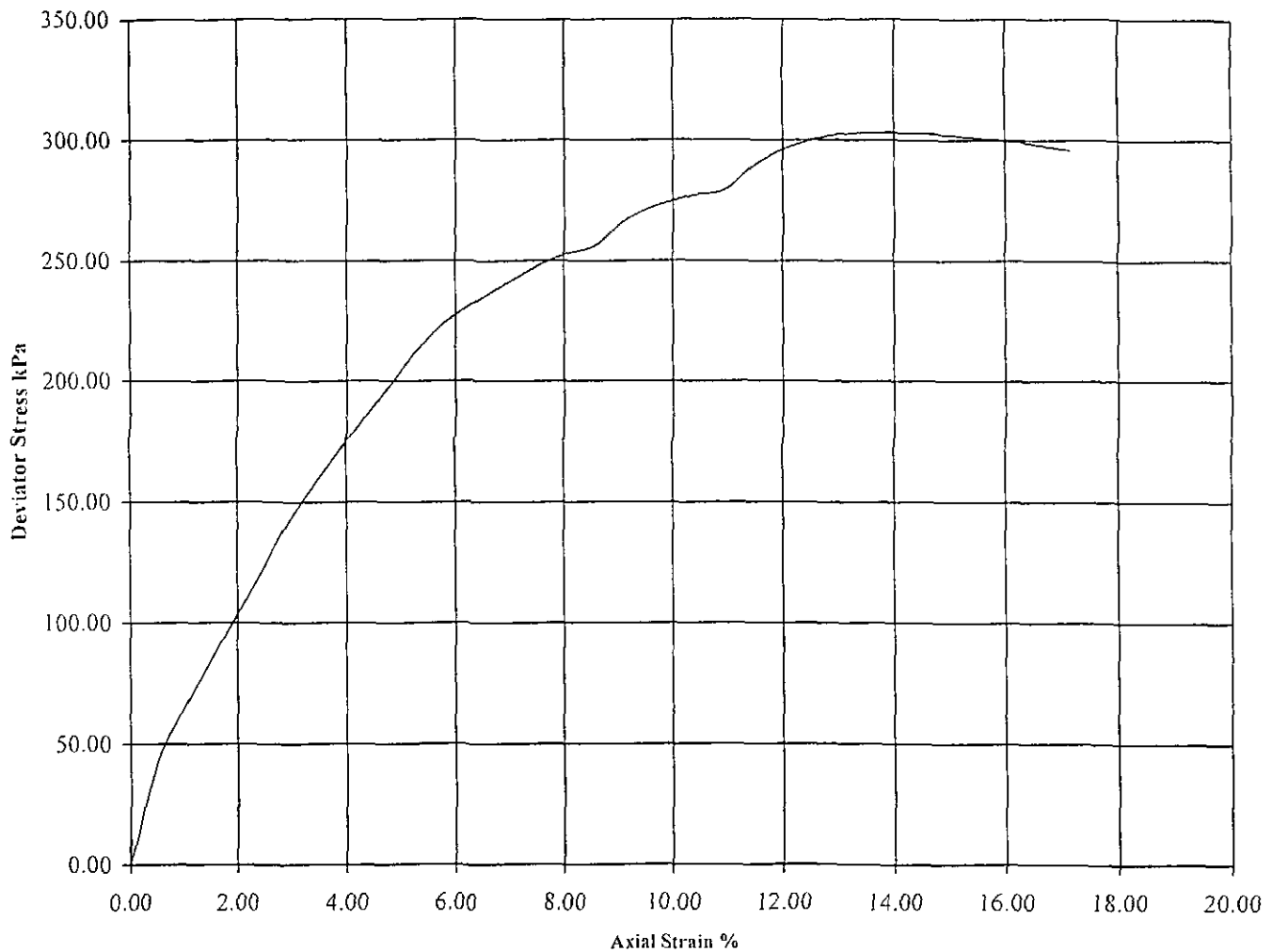
# Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

B.S. 1377 : Part 7 : Clause 9 : 1990

Borehole / Sample Number: BH110

Depth (m): 4.30-4.70



| Diameter (mm): |                      | 102                               | Height (mm):                     |                     | 210                   | Test:          |                    |                 | 100mm Multistage                  |
|----------------|----------------------|-----------------------------------|----------------------------------|---------------------|-----------------------|----------------|--------------------|-----------------|-----------------------------------|
| Specimen       | Moisture Content (%) | Bulk Density (Mg/m <sup>3</sup> ) | Dry Density (Mg/m <sup>3</sup> ) | Cell Pressure (kPa) | Deviator Stress (kPa) | Cohesion (kPa) | Failure Strain (%) | Mode of Failure | Remarks                           |
| A              | 21                   | 2.14                              | 1.77                             | 80                  | 256                   | 128            | 8.6                | Plastic         | See summary of soil descriptions. |
|                |                      |                                   |                                  | 160                 | 279                   | 140            | 11.0               |                 |                                   |
|                |                      |                                   |                                  | 320                 | 303                   | 152            | 13.8               |                 |                                   |

| Checked            | Date   | Approved           | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |



NORTH GAWBER.

Contract No:  
PSL07/2904

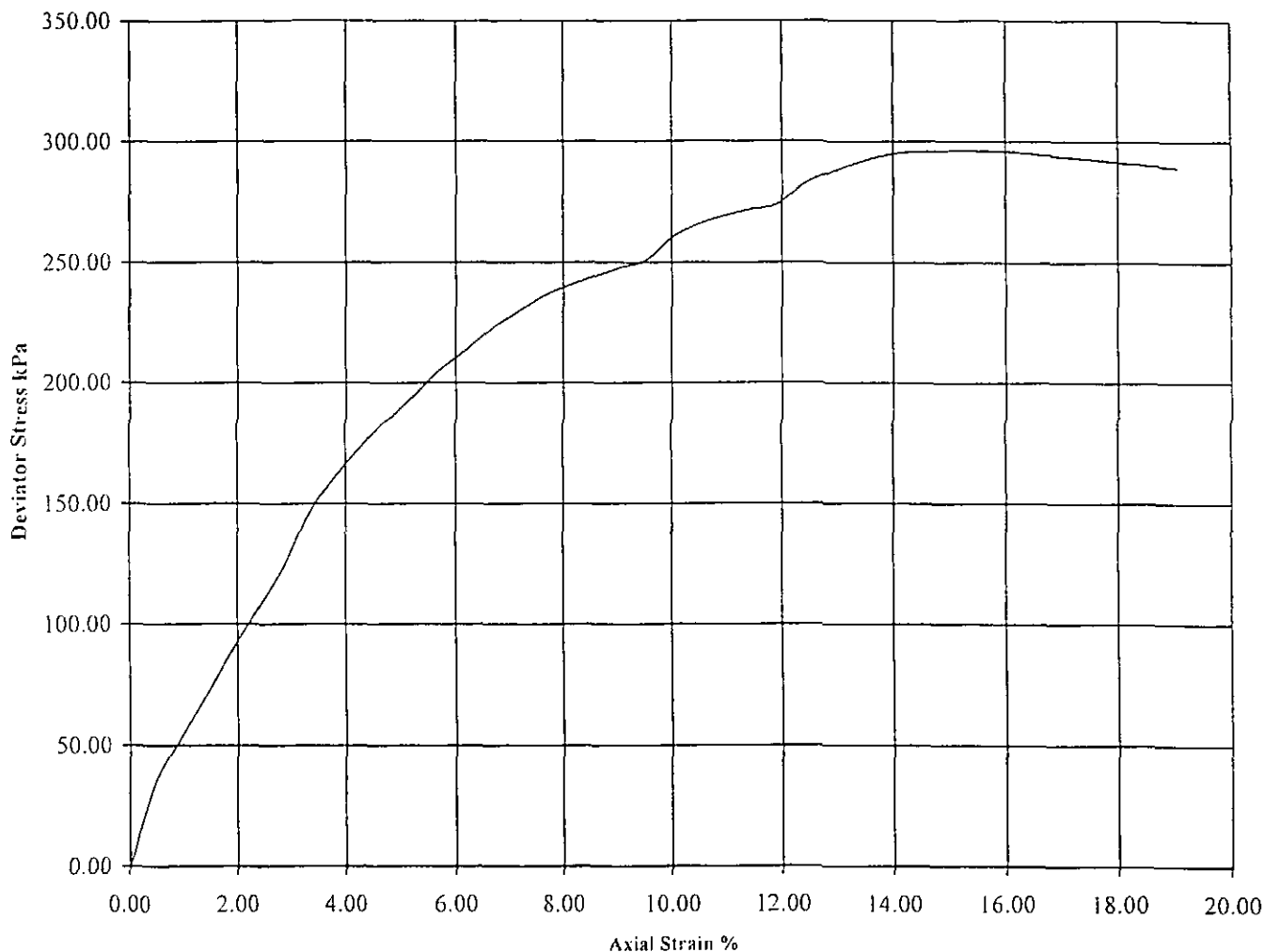
# Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

B.S. 1377 : Part 7 : Clause 9 : 1990

Borehole / Sample Number: BH111

Depth (m): 4.00-4.40



| Diameter (mm): |                      | Height (mm):                      |                                  | Test:               |                       | 100mm Multistage |                    |                 | Remarks |
|----------------|----------------------|-----------------------------------|----------------------------------|---------------------|-----------------------|------------------|--------------------|-----------------|---------|
| Specimen       | Moisture Content (%) | Bulk Density (Mg/m <sup>3</sup> ) | Dry Density (Mg/m <sup>3</sup> ) | Cell Pressure (kPa) | Deviator Stress (kPa) | Cohesion (kPa)   | Failure Strain (%) | Mode of Failure |         |
| A              | 21                   | 2.08                              | 1.72                             | 80                  | 251                   | 125              | 9.5                | Plastic         |         |
|                |                      |                                   |                                  | 160                 | 274                   | 137              | 11.9               |                 |         |
|                |                      |                                   |                                  | 320                 | 296                   | 148              | 15.2               |                 |         |

| Checked            | Date   | Approved           | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |



NORTH GAWBER.

Contract No:  
PSL07/2904

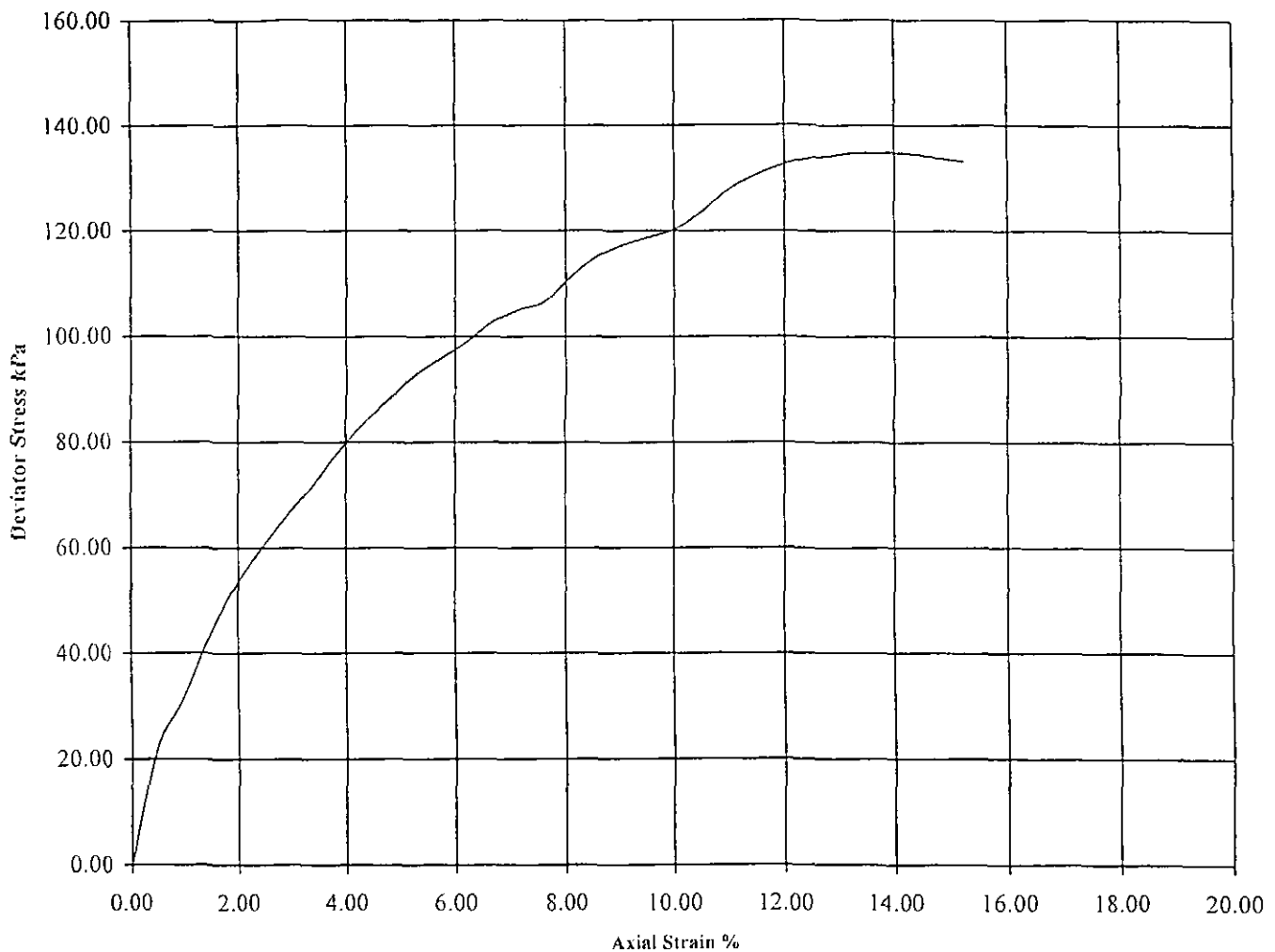
# Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

B.S. 1377 : Part7 : Clause 9 : 1990

Borehole / Sample Number: BH112

Depth (m): 3.20-3.60



| Diameter (mm): |                      | Height (mm):                      |                                  | Test:               |                       | 100mm Multistage |                    |                 | Remarks |
|----------------|----------------------|-----------------------------------|----------------------------------|---------------------|-----------------------|------------------|--------------------|-----------------|---------|
| Specimen       | Moisture Content (%) | Bulk Density (Mg/m <sup>3</sup> ) | Dry Density (Mg/m <sup>3</sup> ) | Cell Pressure (kPa) | Deviator Stress (kPa) | Cohesion (kPa)   | Failure Strain (%) | Mode of Failure |         |
| A              | 26                   | 1.99                              | 1.58                             | 60                  | 107                   | 53               | 7.6                | Plastic         |         |
|                |                      |                                   |                                  | 120                 | 120                   | 60               | 10.0               |                 |         |
|                |                      |                                   |                                  | 240                 | 135                   | 67               | 13.3               |                 |         |

| Checked            | Date   | Approved           | Date   |
|--------------------|--------|--------------------|--------|
| <i>[Signature]</i> | 8/1/08 | <i>[Signature]</i> | 8/1/08 |

**PSL**  
Professional Soils Laboratory

NORTH GAWBER.

Contract No:  
PSL07/2904

**APPENDIX F**  
**Chemical Laboratory Test Report**



2531

6.4.1003



## ANALYTICAL TEST REPORT

**Contract no:** SDA/35844  
**Contract name:** North Gawber Colliery Site  
**Client reference:** 07053  
**Clients name:** Scott Doherty Associates  
**Clients address:** Derwentside Business Centre  
Consett Business Park  
Consett  
Co Durham  
DH8 6BP

**Date received:** 06 December 2007  
**Date started:** 06 December 2007  
**Date of issue:** 12 December 2007

**Notes:** Opinions and interpretations expressed herein are outside the UKAS accreditation scope.  
Unless otherwise stated, Chemtech Environmental Ltd were not responsible for sampling.  
Methods, procedures and performance data are available on request.  
Results reported herein relate only to the material supplied to the laboratory.  
All results are reported on a dry basis.  
This report shall not be reproduced except in full, without prior written approval.  
Samples will be disposed of 8 weeks from initial receipt unless otherwise instructed.

**Key:** U UKAS accredited test  
M MCERTS & UKAS accredited test  
\$ Test carried out by an approved subcontractor  
NAF Non asbestos fibres  
I/S Insufficient sample to test

**Approved by:**

*K Campbell*

Karan Campbell  
Director

John Campbell  
Director

# Chemtech Environmental Limited

## WATERS

| Lab number<br>Sample id<br>Depth (m) |                    |       | 35844-1<br>BH 105 | 35844-2<br>BH 109 | 35844-3<br>BH 112 | 35844-4<br>BH 115 | 35844-5<br>BH 118 |
|--------------------------------------|--------------------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Test                                 | Method             | Units |                   |                   |                   |                   |                   |
| Arsenic                              | CE055 <sup>u</sup> | mg/l  | <0.001            | 0.002             | 0.001             | <0.001            | <0.001            |
| Boron                                | CE063 <sup>u</sup> | mg/l  | 1.51              | 0.23              | 0.25              | 0.47              | 0.15              |
| Cadmium                              | CE055 <sup>u</sup> | mg/l  | 0.009             | <0.001            | <0.001            | <0.001            | <0.001            |
| Chromium                             | CE055 <sup>u</sup> | mg/l  | <0.003            | <0.003            | <0.003            | <0.003            | <0.003            |
| Copper                               | CE055 <sup>u</sup> | mg/l  | <0.004            | <0.004            | <0.004            | <0.004            | 0.005             |
| Lead                                 | CE055 <sup>u</sup> | mg/l  | 0.015             | <0.009            | <0.009            | <0.009            | <0.009            |
| Mercury                              | CE055 <sup>u</sup> | mg/l  | <0.001            | <0.001            | <0.001            | <0.001            | <0.001            |
| Nickel                               | CE055 <sup>u</sup> | mg/l  | 1.898             | 0.096             | 0.079             | 0.013             | 0.010             |
| Selenium                             | CE055 <sup>u</sup> | mg/l  | 0.121             | 0.005             | 0.003             | 0.002             | <0.001            |
| Zinc                                 | CE055 <sup>u</sup> | mg/l  | 4.353             | 0.726             | <0.020            | <0.020            | 0.030             |
| pH                                   | CE004 <sup>u</sup> | units | 5.0               | 6.5               | 6.5               | 6.6               | 7.1               |
| Sulphate                             | CE049 <sup>u</sup> | mg/l  | 7243              | 637               | 1405              | 2879              | 613               |
| Sulphide                             | CE016 <sup>u</sup> | mg/l  | <0.1              | <0.1              | <0.1              | <0.1              | <0.1              |
| Cyanide (total)                      | CE013 <sup>u</sup> | mg/l  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Phenols (total)                      | CE053              | mg/l  | <0.0005           | <0.0005           | <0.0005           | <0.0005           | <0.0005           |
| PAH (total)                          | CE051              | mg/l  | 1/S               | <0.0001           | <0.0001           | <0.0001           | <0.0001           |
| TPH (C10-C40)                        | CE052              | mg/l  | 1/S               | <0.01             | 0.04              | 0.01              | 0.03              |

# Chemtech Environmental Limited

## METHOD DETAILS

| METHOD | WATERS/LEACHATES | METHOD SUMMARY                 | STATUS | LOD    | UNITS |
|--------|------------------|--------------------------------|--------|--------|-------|
| CE055  | Arsenic          | ICP-OES                        | U      | 0.001  | mg/l  |
| CE063  | Boron            | ICP-OES                        | U      | 0.03   | mg/l  |
| CE055  | Cadmium          | ICP-OES                        | U      | 0.001  | mg/l  |
| CE055  | Chromium         | ICP-OES                        | U      | 0.003  | mg/l  |
| CE055  | Copper           | ICP-OES                        | U      | 0.004  | mg/l  |
| CE055  | Lead             | ICP-OES                        | U      | 0.009  | mg/l  |
| CE055  | Mercury          | ICP-OES                        | U      | 0.001  | mg/l  |
| CE055  | Nickel           | ICP-OES                        | U      | 0.003  | mg/l  |
| CE055  | Selenium         | ICP-OES                        | U      | 0.001  | mg/l  |
| CE055  | Zinc             | ICP-OES                        | U      | 0.02   | mg/l  |
| CE004  | pH               | BS 1377, pH Meter              | U      | 0.1    | units |
| CE034  | Sulphate         | Ion Chromatography             | U      | 10     | mg/l  |
| CE016  | Sulphide         | Acid distillation, Titrimetry  |        | 0.1    | mg/l  |
| CE013  | Cyanide (total)  | Acid distillation, Colorimetry | U      | 0.02   | mg/l  |
| CE073  | Phenols (total)  | HPLC                           |        | 0.0005 | mg/l  |
| CE051  | PAH (total)      | Solvent extraction, GC-FID     |        | 0.0001 | mg/l  |
| CE052  | TPH (C10-C40)    | Solvent extraction, GC-FID     | U      | 0.01   | mg/l  |



17 JAN 2008



## ANALYTICAL TEST REPORT

for

Scott Doherty Associates

Derwentside Business Centre,

Consett Business Park, Consett,

Co Durham, DH8 6BP

Contract name: North Gawber Colliery Site,  
Barnsley, Area 1,  
(North-West Recreational  
Area)

Contract no: SDA/35564(2)

Copies to:  
Mark Doherty



**Comments:**

Determinations marked ! in this report are not included in the UKAS Accreditation schedule for the laboratory.

Unless otherwise stated, Chemtech Environmental Ltd were not responsible for sampling.

Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

All analysis was carried out using Chemtech Environmental Ltd methods unless otherwise agreed.

Methods, procedures and performance data are available on request.

Tests marked \$ have been subcontracted.

The test results in this report relate only to the actual samples on which testing has been performed.

This report is confidential and is provided for use by the client and the use of their clients only.

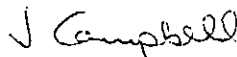
Date submitted for analysis: 30 October 2007

Date tests started: 30 October 2007

Client reference: -

**Report Approval**

Authorised by:



Name:

John Campbell

Position:

Director

Report date:

13 December 2007

This is a supplementary report to report number SDA/35564(1) issued 30 November 2007.

# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                               | Lab Number<br>Sample id<br>Depth (m) | 35564-1<br>TP 1<br>0.50 | 35564-2<br>TP 1<br>2.90 | 35564-3<br>TP 1<br>4.20 | 35564-4<br>TP 2<br>1.85 | 35564-5<br>TP 2<br>2.70 | 35564-6<br>TP 3<br>sample 1 | 35564-7<br>TP 3<br>1.50 | 35564-8<br>TP 3<br>4.00 |
|-------------------------------|--------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|
| <b>Determinands</b>           | <b>Units</b>                         |                         |                         |                         |                         |                         |                             |                         |                         |
| Arsenic (total)               | mg/kg As                             | 28                      | 7                       | 9                       | 18                      | 21                      | 25                          | 15                      | 18                      |
| Boron (water soluble)         | mg/kg B                              | 0.6                     | 1.1                     | 0.6                     | 1.4                     | 0.9                     | 0.5                         | 1.3                     | 1.6                     |
| Cadmium (total)               | mg/kg Cd                             | <0.2                    | <0.2                    | <0.2                    | 0.2                     | 0.3                     | 0.2                         | 0.3                     | <0.2                    |
| Chromium (total)              | mg/kg Cr                             | 21                      | 21                      | 23                      | 12                      | 25                      | 22                          | 18                      | 24                      |
| Copper (total)                | mg/kg Cu                             | 48                      | 19                      | 22                      | 39                      | 36                      | 50                          | 35                      | 28                      |
| Lead (total)                  | mg/kg Pb                             | 28                      | 22                      | 13                      | 55                      | 28                      | 43                          | 31                      | 30                      |
| Mercury (total)               | mg/kg Hg                             | <0.5                    | <0.5                    | <0.5                    | <0.5                    | <0.5                    | <0.5                        | <0.5                    | <0.5                    |
| Nickel (total)                | mg/kg Ni                             | 24                      | 16                      | 31                      | 23                      | 34                      | 33                          | 30                      | 26                      |
| Selenium (total)              | mg/kg Se                             | <0.3                    | <0.3                    | <0.3                    | <0.3                    | <0.3                    | <0.3                        | <0.3                    | <0.3                    |
| Zinc (total)                  | mg/kg Zn                             | 69                      | 62                      | 79                      | 49                      | 71                      | 80                          | 78                      | 61                      |
| pH                            | units pH                             | 3.5                     | 6.8                     | 6.7                     | 6.7                     | 6.8                     | 6.9                         | 7.7                     | 6.6                     |
| Magnesium (2:1 water soluble) | mg/l Mg                              | -                       | -                       | -                       | -                       | 35                      | -                           | -                       | -                       |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>                 | -                       | -                       | -                       | -                       | 1750                    | -                           | -                       | -                       |
| Sulphate (total)              | mg/kg SO <sub>4</sub>                | 4412                    | 428                     | 230                     | 2461                    | 6544                    | 2074                        | 2766                    | 362                     |
| Sulphide                      | mg/kg S <sup>2-</sup>                | 43                      | 43                      | 10                      | 10                      | <10                     | 10                          | 10                      | 10                      |
| Sulphur (total)               | mg/kg S                              | -                       | -                       | -                       | -                       | 3957                    | -                           | -                       | -                       |
| Cyanide (total)               | mg/kg CN                             | <2                      | <2                      | <2                      | <2                      | <2                      | <2                          | <2                      | <2                      |
| TEM                           | mg/kg                                | 310                     | 170                     | 140                     | 760                     | 300                     | 390                         | 490                     | 150                     |
| Loss on Ignition              | % w/w                                | 21.28                   | -                       | -                       | 40.43                   | 7.98                    | 12.54                       | 20.60                   | 7.85                    |
| Organic matter content        | % w/w                                | 5.52                    | 1.66                    | 0.23                    | 9.26                    | 3.55                    | 5.68                        | 5.11                    | 4.81                    |
| Calorific Value               | kJ/kg                                | -                       | -                       | -                       | 5235                    | -                       | -                           | -                       | -                       |
| Phenols (total)               | mg/kg                                | -                       | -                       | -                       | <0.5                    | -                       | -                           | -                       | -                       |

# SOILS

Scott Doherty Associates  
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|                      | Lab Number   | 35564-1 | 35564-2 | 35564-3 | 35564-4 | 35564-5 | 35564-6  | 35564-7 | 35564-8 |
|----------------------|--------------|---------|---------|---------|---------|---------|----------|---------|---------|
|                      | Sample Id    | TP 1    | TP 1    | TP 1    | TP 2    | TP 2    | TP 3     | TP 3    | TP 3    |
|                      | Depth (m)    | 0.50    | 2.90    | 4.20    | 1.85    | 2.70    | sample 1 | 1.50    | 4.00    |
| <b>Determinands</b>  | <b>Units</b> |         |         |         |         |         |          |         |         |
| Naphthalene          | mg/kg        | -       | -       | -       | 1.7     | -       | -        | -       | -       |
| Acenaphthylene       | mg/kg        | -       | -       | -       | 1.2     | -       | -        | -       | -       |
| Acenaphthene         | mg/kg        | -       | -       | -       | 0.6     | -       | -        | -       | -       |
| Fluorene             | mg/kg        | -       | -       | -       | 2.2     | -       | -        | -       | -       |
| Phenanthrene         | mg/kg        | -       | -       | -       | 2.2     | -       | -        | -       | -       |
| Anthracene           | mg/kg        | -       | -       | -       | 11.0    | -       | -        | -       | -       |
| Fluoranthene         | mg/kg        | -       | -       | -       | 0.5     | -       | -        | -       | -       |
| Pyrene               | mg/kg        | -       | -       | -       | 2.1     | -       | -        | -       | -       |
| Benzo(a)anthracene   | mg/kg        | -       | -       | -       | 0.9     | -       | -        | -       | -       |
| Chrysene             | mg/kg        | -       | -       | -       | <0.1    | -       | -        | -       | -       |
| Benzo(b)fluoranthene | mg/kg        | -       | -       | -       | 0.7     | -       | -        | -       | -       |
| Benzo(k)fluoranthene | mg/kg        | -       | -       | -       | 0.2     | -       | -        | -       | -       |
| Benzo(a)pyrene       | mg/kg        | -       | -       | -       | 0.7     | -       | -        | -       | -       |
| Indeno(123cd)pyrene  | mg/kg        | -       | -       | -       | 0.6     | -       | -        | -       | -       |
| Dibenz(ah)anthracene | mg/kg        | -       | -       | -       | <0.1    | -       | -        | -       | -       |
| Benzo(ghi)perylene   | mg/kg        | -       | -       | -       | 0.7     | -       | -        | -       | -       |
| PAH (total)          | mg/kg        | -       | -       | -       | 25      | -       | -        | -       | -       |

# SOILS

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|                       | Lab Number   | 35564-1 | 35564-2 | 35564-3 | 35564-4 | 35564-5 | 35564-6  | 35564-7 | 35564-8 |
|-----------------------|--------------|---------|---------|---------|---------|---------|----------|---------|---------|
|                       | Sample id    | TP 1    | TP 1    | TP 1    | TP 2    | TP 2    | TP 3     | TP 3    | TP 3    |
|                       | Depth (m)    | 0.50    | 2.90    | 4.20    | 1.85    | 2.70    | sample 1 | 1.50    | 4.00    |
| <b>Determinands</b>   | <b>Units</b> |         |         |         |         |         |          |         |         |
| TPH (C5-C10)          | ! mg/kg      | -       | -       | -       | <1      | -       | -        | -       | -       |
| TPH (C10-C28)         | ! mg/kg      | -       | -       | -       | 1043    | -       | -        | -       | -       |
| TPH (C28-C40)         | ! mg/kg      | -       | -       | -       | 397     | -       | -        | -       | -       |
| TPH Aromatic C5-C7    | ! mg/kg      | -       | -       | -       | 0.03    | -       | -        | -       | -       |
| TPH Aromatic C7-C8    | ! mg/kg      | -       | -       | -       | <0.01   | -       | -        | -       | -       |
| TPH Aromatic C8-C10   | ! mg/kg      | -       | -       | -       | <0.01   | -       | -        | -       | -       |
| TPH Aromatic C10-C12  | ! mg/kg      | -       | -       | -       | 2       | -       | -        | -       | -       |
| TPH Aromatic C12-C16  | ! mg/kg      | -       | -       | -       | 5       | -       | -        | -       | -       |
| TPH Aromatic C16-C21  | ! mg/kg      | -       | -       | -       | 25      | -       | -        | -       | -       |
| TPH Aromatic C21-C35  | ! mg/kg      | -       | -       | -       | 10      | -       | -        | -       | -       |
| TPH Aliphatic C5-C6   | ! mg/kg      | -       | -       | -       | <0.1    | -       | -        | -       | -       |
| TPH Aliphatic C6-C8   | ! mg/kg      | -       | -       | -       | <0.1    | -       | -        | -       | -       |
| TPH Aliphatic C8-C10  | ! mg/kg      | -       | -       | -       | <0.1    | -       | -        | -       | -       |
| TPH Aliphatic C10-C12 | ! mg/kg      | -       | -       | -       | 88      | -       | -        | -       | -       |
| TPH Aliphatic C12-C16 | ! mg/kg      | -       | -       | -       | 165     | -       | -        | -       | -       |
| TPH Aliphatic C16-C21 | ! mg/kg      | -       | -       | -       | 485     | -       | -        | -       | -       |
| TPH Aliphatic C21-C35 | ! mg/kg      | -       | -       | -       | 702     | -       | -        | -       | -       |

# LEACHATES

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                       |                      |          |
|-----------------------|----------------------|----------|
|                       | Lab Number           | 35564-4L |
|                       | Sample id            | TP 2     |
|                       | Depth                | 1.85     |
| <b>Determinands</b>   | <b>Units</b>         |          |
| Arsenic (total)       | mg/l As              | <0.001   |
| Boron (water soluble) | mg/l B               | 0.29     |
| Cadmium (total)       | mg/l Cd              | <0.001   |
| Chromium (total)      | mg/l Cr              | <0.003   |
| Copper (total)        | mg/l Cu              | <0.004   |
| Lead (total)          | mg/l Pb              | <0.009   |
| Mercury (total)       | mg/l Hg              | <0.001   |
| Nickel (total)        | mg/l Ni              | 0.004    |
| Selenium (total)      | mg/l Se              | 0.013    |
| Zinc (total)          | mg/l Zn              | <0.020   |
| pH                    | units pH             | 7.0      |
| Sulphate              | mg/l SO <sub>4</sub> | 191      |
| Sulphide              | mg/l S <sup>2-</sup> | <0.1     |
| Cyanide (total)       | mg/l CN              | <0.001   |
| Phenols (total)       | mg/l PhOH            | <0.0005  |
| PAH (total)           | mg/l                 | <0.0001  |
| TPH (C10-C40)         | mg/l                 | 0.11     |

ANALYTICAL TEST REPORT

for

Scott Doherty Associates

Derwentside Business Centre,

Consett Business Park, Consett,

Co Durham, DH8 6BP

Contract name: North Gawber Colliery Site,  
Barnsley, Area 2,  
(North-West Rail Sidings  
Area)

Contract no: SDA/35565(3)

Copies to:  
Mark Doherty

**Comments:**

Determinations marked ! in this report are not included in the UKAS Accreditation schedule for the laboratory.

Unless otherwise stated, Chemtech Environmental Ltd were not responsible for sampling.

Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

All analysis was carried out using Chemtech Environmental Ltd methods unless otherwise agreed.

Methods, procedures and performance data are available on request.

Tests marked \$ have been subcontracted.

The test results in this report relate only to the actual samples on which testing has been performed.

This report is confidential and is provided for use by the client and the use of their clients only.

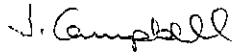
Date submitted for analysis: 30 October 2007

Date tests started: 30 October 2007

Client reference: 08 February 2008

**Report Approval**

Authorised by:



Name:

John Campbell

Position:

Director

Report date:

08 February 2008

This is a supplementary report to report number SDA/35565(2) issued 13 December 2007.



# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                               | Lab Number            | 35565-1 | 35565-2 | 35565-3 | 35565-4 | 35565-5 | 35565-6 | 35565-7 | 35565-8 | 35565-9 | 35565-10 | 35565-11 | 35565-12 |
|-------------------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                               | Sample id             | TP 5    | TP 5    | TP 6    | TP 7    | TP 7    | TP 7    | TP 8    | TP 8B   | TP 9    | TP 9     | TP 10    | TP 10    |
|                               | Depth (m)             | 0.20    | 1.10    | 2.20    | 0.20    | 1.00    | 2.60    | 0.10    | 1.50    | 0.50    | 2.00     | 0.10     | 2.00     |
| <b>Determinands</b>           | <b>Units</b>          |         |         |         |         |         |         |         |         |         |          |          |          |
| Arsenic (total)               | mg/kg As              | 29      | 38      | 33      | 34      | 29      | 10      | 23      | 11      | 19      | 52       | 14       | 4        |
| Boron (water soluble)         | mg/kg B               | 0.5     | 0.7     | 0.7     | 0.9     | 0.6     | 0.6     | 0.4     | 0.4     | 0.7     | 0.9      | 0.5      | 1.5      |
| Cadmium (total)               | mg/kg Cd              | 0.3     | 0.3     | <0.2    | <0.2    | <0.2    | <0.2    | 0.2     | <0.2    | 0.2     | <0.2     | 0.6      | <0.2     |
| Chromium (total)              | mg/kg Cr              | 41      | 31      | 10      | 7       | 17      | 18      | 20      | 19      | 13      | 11       | 14       | 22       |
| Copper (total)                | mg/kg Cu              | 75      | 80      | 81      | 32      | 44      | 26      | 37      | 27      | 28      | 45       | 55       | 24       |
| Lead (total)                  | mg/kg Pb              | 90      | 70      | 57      | 45      | 32      | 45      | 29      | 23      | 21      | 30       | 27       | 10       |
| Mercury (total)               | ! mg/kg Hg            | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 32      | 32      | 20      | 13      | 20      | 25      | 31      | 32      | 26      | 12       | 18       | 24       |
| Selenium (total)              | mg/kg Se              | 0.6     | 1.2     | 1.2     | 1.0     | <0.3    | 0.7     | <0.3    | <0.3    | <0.3    | 1.3      | <0.3     | <0.3     |
| Zinc (total)                  | mg/kg Zn              | 113     | 111     | 24      | 78      | 50      | 42      | 71      | 72      | 77      | 30       | 114      | 72       |
| pH                            | units pH              | 8.0     | 7.9     | 8.2     | 4.0     | 5.6     | 6.0     | 5.9     | 6.6     | 7.1     | 4.0      | 8.3      | 8.0      |
| Magnesium (2:1 water soluble) | mg/l Mg               | -       | -       | -       | 18      | 19      | -       | -       | -       | 32      | 21       | -        | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | -       | -       | -       | 1810    | 2627    | -       | -       | -       | 3303    | 933      | -        | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 1836    | 1342    | 2396    | 22992   | 7541    | 1597    | 1506    | 1021    | 45992   | 8849     | 1243     | 346      |
| Sulphide                      | mg/kg S <sup>2-</sup> | <10     | <10     | 22      | 10      | 10      | 14      | 14      | <10     | <10     | 18       | 18       | 35       |
| Sulphur (total)               | ! mg/kg S             | -       | -       | -       | 8199    | 3235    | -       | -       | -       | 17073   | 8207     | -        | -        |
| Cyanide (total)               | mg/kg CN              | <2      | <2      | <2      | <2      | <2      | <2      | <2      | <2      | <2      | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 1660    | 1260    | 530     | 270     | 1780    | 200     | 110     | 50      | 240     | 4170     | 770      | 2150     |
| Loss on Ignition              | % w/w                 | 22.97   | 32.03   | 39.31   | 52.59   | 21.27   | -       | 14.62   | 5.66    | 31.10   | 38.46    | 12.88    | -        |
| Organic matter content        | % w/w                 | 8.59    | 9.72    | 10.86   | 12.65   | 6.17    | 5.74    | 4.79    | 3.45    | 5.48    | 12.07    | 4.61     | 0.95     |
| Calorific Value               | ! kJ/kg               | -       | 4061    | 6458    | 1901    | -       | -       | -       | -       | 6230    | 7277     | -        | -        |
| Phenols (total)               | mg/kg                 | <0.5    | <0.5    | <0.5    | -       | <0.5    | -       | -       | -       | -       | <0.5     | <0.5     | <0.5     |
| Asbestos                      | \$                    | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
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|                      | Lab Number   | 35565-1 | 35565-2 | 35565-3 | 35565-4 | 35565-5 | 35565-6 | 35565-7 | 35565-8 | 35565-9 | 35565-10 | 35565-11 | 35565-12 |
|----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                      | Sample id    | TP 5    | TP 5    | TP 6    | TP 7    | TP 7    | TP 7    | TP 8    | TP 8B   | TP 9    | TP 9     | TP 10    | TP 10    |
|                      | Depth (m)    | 0.20    | 1.10    | 2.20    | 0.20    | 1.00    | 2.60    | 0.10    | 1.50    | 0.50    | 2.00     | 0.10     | 2.00     |
| <b>Determinands</b>  | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| Naphthalene          | ! mg/kg      | 0.9     | 0.6     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthylene       | ! mg/kg      | 0.2     | 0.1     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthene         | ! mg/kg      | 0.2     | 0.2     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluorene             | ! mg/kg      | 0.2     | 0.5     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Phenanthrene         | ! mg/kg      | 1.8     | 1.8     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Anthracene           | ! mg/kg      | 0.8     | 0.8     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluoranthene         | ! mg/kg      | 3.0     | 2.8     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Pyrene               | ! mg/kg      | 3.4     | 3.3     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | 1.7     | 1.6     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Chrysene             | ! mg/kg      | <0.1    | <0.1    | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | 2.2     | 2.1     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | 1.4     | 0.6     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | 1.9     | 1.5     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | 0.2     | 0.1     | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | 0.1     | <0.1    | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | 0.3     | <0.1    | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| PAH (total)          | ! mg/kg      | 18      | 16      | 7.8     | -       | 5.8     | -       | -       | -       | -       | 5.3      | 6.9      | <5       |

# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
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DH8 6BP

|                       | Lab Number   | 35565-1 | 35565-2 | 35565-3 | 35565-4 | 35565-5 | 35565-6 | 35565-7 | 35565-8 | 35565-9 | 35565-10 | 35565-11 | 35565-12 |
|-----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                       | Sample id    | TP 5    | TP 5    | TP 6    | TP 7    | TP 7    | TP 7    | TP 8    | TP 8B   | TP 9    | TP 9     | TP 10    | TP 10    |
|                       | Depth (m)    | 0.20    | 1.10    | 2.20    | 0.20    | 1.00    | 2.60    | 0.10    | 1.50    | 0.50    | 2.00     | 0.10     | 2.00     |
| <b>Determinands</b>   | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | <1      | <1      | <1      | -       | <1      | -       | -       | -       | -       | <1       | <1       | <1       |
| TPH (C10-C28)         | ! mg/kg      | <10     | 638     | 698     | -       | 423     | -       | -       | -       | -       | 447      | 883      | 963      |
| TPH (C28-C40)         | ! mg/kg      | <10     | 451     | 463     | -       | 331     | -       | -       | -       | -       | 218      | 767      | 1694     |
| TPH Aromatic C5-C7    | ! mg/kg      | -       | <0.01   | <0.01   | -       | <0.01   | -       | -       | -       | -       | <0.01    | <0.01    | <0.01    |
| TPH Aromatic C7-C8    | ! mg/kg      | -       | <0.01   | <0.01   | -       | <0.01   | -       | -       | -       | -       | <0.01    | <0.01    | <0.01    |
| TPH Aromatic C8-C10   | ! mg/kg      | -       | <0.01   | <0.01   | -       | <0.01   | -       | -       | -       | -       | <0.01    | <0.01    | <0.01    |
| TPH Aromatic C10-C12  | ! mg/kg      | -       | 1       | <1      | -       | <1      | -       | -       | -       | -       | <1       | <1       | <1       |
| TPH Aromatic C12-C16  | ! mg/kg      | -       | 1       | <1      | -       | <1      | -       | -       | -       | -       | <1       | <1       | <1       |
| TPH Aromatic C16-C21  | ! mg/kg      | -       | 18      | 4       | -       | 3       | -       | -       | -       | -       | 3        | 4        | <1       |
| TPH Aromatic C21-C35  | ! mg/kg      | -       | 11      | 8       | -       | 6       | -       | -       | -       | -       | 4        | 6        | 3        |
| TPH Aliphatic C5-C6   | ! mg/kg      | -       | <0.1    | <0.1    | -       | <0.1    | -       | -       | -       | -       | <0.1     | <0.1     | <0.1     |
| TPH Aliphatic C6-C8   | ! mg/kg      | -       | <0.1    | <0.1    | -       | <0.1    | -       | -       | -       | -       | <0.1     | <0.1     | <0.1     |
| TPH Aliphatic C8-C10  | ! mg/kg      | -       | <0.1    | <0.1    | -       | <0.1    | -       | -       | -       | -       | <0.1     | <0.1     | <0.1     |
| TPH Aliphatic C10-C12 | ! mg/kg      | -       | 39      | 40      | -       | 34      | -       | -       | -       | -       | 41       | 43       | 9        |
| TPH Aliphatic C12-C16 | ! mg/kg      | -       | 83      | 65      | -       | 61      | -       | -       | -       | -       | 73       | 89       | 26       |
| TPH Aliphatic C16-C21 | ! mg/kg      | -       | 249     | 179     | -       | 189     | -       | -       | -       | -       | 165      | 351      | 106      |
| TPH Aliphatic C21-C35 | ! mg/kg      | -       | 718     | 877     | -       | 470     | -       | -       | -       | -       | 386      | 1167     | 2516     |

# SOILS

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|                               | Lab Number            | 35565-13 | 35565-14 | 35565-15 | 35565-16 | 35565-17 | 35565-18 |
|-------------------------------|-----------------------|----------|----------|----------|----------|----------|----------|
|                               | Sample id             | TP 11    | TP 12B   | TP 13    | TP 13    | TP 14    | TP 14    |
|                               | Depth (m)             | 0.30     | 1.50     | 0.20     | 3.40     | 2.10     | 4.10     |
| <b>Determinands</b>           | <b>Units</b>          |          |          |          |          |          |          |
| Arsenic (total)               | mg/kg As              | 32       | 27       | 21       | 24       | 22       | 6        |
| Boron (water soluble)         | mg/kg B               | 0.6      | 0.5      | 0.3      | 0.3      | 0.4      | 0.4      |
| Cadmium (total)               | mg/kg Cd              | 0.8      | 0.4      | 0.2      | <0.2     | <0.2     | <0.2     |
| Chromium (total)              | mg/kg Cr              | 19       | 16       | 21       | 19       | 17       | 17       |
| Copper (total)                | mg/kg Cu              | 69       | 38       | 41       | 41       | 35       | 18       |
| Lead (total)                  | mg/kg Pb              | 39       | 49       | 29       | 25       | 25       | 16       |
| Mercury (total)               | mg/kg Hg              | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 34       | 26       | 33       | 27       | 22       | 24       |
| Selenium (total)              | mg/kg Se              | 0.5      | 0.5      | <0.3     | <0.3     | <0.3     | <0.3     |
| Zinc (total)                  | mg/kg Zn              | 129      | 80       | 95       | 75       | 65       | 63       |
| pH                            | units pH              | 8.0      | 7.6      | 3.5      | 3.7      | 3.5      | 6.7      |
| Magnesium (2:1 water soluble) | mg/l Mg               | -        | -        | 41       | 49       | 51       | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | -        | -        | 1303     | 1878     | 944      | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 3820     | 1317     | 8965     | 6791     | 8191     | 4009     |
| Sulphide                      | mg/kg S <sup>2-</sup> | 35       | 18       | 43       | 35       | 14       | 10       |
| Sulphur (total)               | mg/kg S               | -        | -        | 3554     | 2750     | 4482     | -        |
| Cyanide (total)               | mg/kg CN              | <2       | <2       | <2       | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 460      | 310      | 100      | 70       | 100      | 180      |
| Loss on Ignition              | % w/w                 | 19.72    | 21.30    | 14.81    | 14.3     | 14.96    | -        |
| Organic matter content        | % w/w                 | 7.13     | 5.61     | 4.98     | 4.76     | 4.78     | 1.74     |
| Calorific Value               | kJ/kg                 | -        | -        | -        | -        | -        | -        |
| Phenols (total)               | mg/kg                 | -        | -        | -        | -        | -        | -        |
| Asbestos                      | \$                    | NAF      | -        | -        | -        | -        | -        |

NAF=Non Asbestos Fibres

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# SOILS

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|                      | Lab Number   | 35565-13 | 35565-14 | 35565-15 | 35565-16 | 35565-17 | 35565-18 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|
|                      | Sample id    | TP 11    | TP 12B   | TP 13    | TP 13    | TP 14    | TP 14    |
|                      | Depth (m)    | 0.30     | 1.50     | 0.20     | 3.40     | 2.10     | 4.10     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Acenaphthylene       | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Acenaphthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Fluorene             | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Phenanthrene         | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Anthracene           | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Fluoranthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Pyrene               | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Chrysene             | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -        | -        | -        | -        | -        | -        |
| PAH (total)          | ! mg/kg      | -        | -        | -        | -        | -        | -        |

# SOILS

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DH8 6BP

|                       | Lab Number   | 35565-13 | 35565-14 | 35565-15 | 35565-16 | 35565-17 | 35565-18 |
|-----------------------|--------------|----------|----------|----------|----------|----------|----------|
|                       | Sample id    | TP 11    | TP 12B   | TP 13    | TP 13    | TP 14    | TP 14    |
|                       | Depth (m)    | 0.30     | 1.50     | 0.20     | 3.40     | 2.10     | 4.10     |
| <b>Determinands</b>   | <b>Units</b> |          |          |          |          |          |          |
| TPH (C5-C10)          | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH (C10-C28)         | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH (C28-C40)         | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C5-C7    | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C7-C8    | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C8-C10   | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C10-C12  | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C12-C16  | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C16-C21  | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C21-C35  | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C5-C6   | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C6-C8   | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C8-C10  | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C10-C12 | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C12-C16 | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C16-C21 | l mg/kg      | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C21-C35 | l mg/kg      | -        | -        | -        | -        | -        | -        |

NAF=Non Asbestos Fibres

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# LEACHATES

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                       | Lab Number           | 35565-2L | 35565-11L |
|-----------------------|----------------------|----------|-----------|
|                       | Sample id            | TP 5     | TP 10     |
|                       | Depth                | 1.10     | 0.10      |
| <b>Determinands</b>   | <b>Units</b>         |          |           |
| Arsenic (total)       | mg/l As              | <0.001   | 0.002     |
| Boron (water soluble) | mg/l B               | 0.05     | <0.03     |
| Cadmium (total)       | mg/l Cd              | <0.001   | <0.001    |
| Chromium (total)      | mg/l Cr              | <0.003   | <0.003    |
| Copper (total)        | mg/l Cu              | <0.004   | <0.004    |
| Lead (total)          | mg/l Pb              | <0.009   | <0.009    |
| Mercury (total)       | mg/l Hg              | <0.001   | <0.001    |
| Nickel (total)        | mg/l Ni              | <0.003   | <0.003    |
| Selenium (total)      | mg/l Se              | 0.002    | <0.001    |
| Zinc (total)          | mg/l Zn              | <0.020   | <0.020    |
| pH                    | units pH             | 6.9      | 7.4       |
| Sulphate              | mg/l SO <sub>4</sub> | 24       | <10       |
| Sulphide              | mg/l S <sup>2-</sup> | <0.1     | <0.1      |
| Cyanide (total)       | mg/l CN              | <0.02    | <0.02     |
| Phenols (total)       | mg/l PhOH            | <0.0005  | <0.0005   |
| PAH (total)           | mg/l                 | <0.0001  | <0.0001   |
| TPH (C10-C40)         | mg/l                 | 0.07     | 0.13      |

10 JUL 2006



## ANALYTICAL TEST REPORT

for

Scott Doherty Associates

Derwentside Business Centre,

Consett Business Park, Consett,

Co Durham, DH8 6BP

Contract name: North Gawber Colliery Site,  
Barnsley, Area 3,  
(Central Spoil Area)

Contract no: SDA/35566(2)

Copies to:  
Mark Doherty





**Comments:**

Determinations marked ! in this report are not included in the UKAS Accreditation schedule for the laboratory.

Unless otherwise stated, Chemtech Environmental Ltd were not responsible for sampling.

Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

All analysis was carried out using Chemtech Environmental Ltd methods unless otherwise agreed.

Methods, procedures and performance data are available on request.

Tests marked \$ have been subcontracted.

The test results in this report relate only to the actual samples on which testing has been performed.

This report is confidential and is provided for use by the client and the use of their clients only.

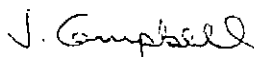
Date submitted for analysis: 30 October 2007

Date tests started: 30 October 2007

Client reference: -

**Report Approval**

Authorised by:



Name:

John Campbell

Position:

Director

Report date:

13 December 2007

This is a supplementary report to report number SDA/35566(1) issued 30 November 2007.

# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                               | Lab Number            | 35566-1 | 35566-2 | 35566-3 | 35566-4 | 35566-5 | 35566-6 | 35566-7 | 35566-8 | 35566-9 | 35566-10 | 35566-11 | 35566-12 |
|-------------------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                               | Sample id             | TP 16   | TP 16   | TP 16   | TP 17   | TP 17   | TP 18   | TP 18   | TP 19   | TP 19   | TP 19    | TP 20    | TP 20    |
|                               | Depth (m)             | 0.30    | 2.10    | 3.60    | 0.20    | 2.30    | 0.70    | 2.00    | 0.20    | 1.50    | 3.40     | 0.20     | 1.00     |
| <b>Determinands</b>           | <b>Units</b>          |         |         |         |         |         |         |         |         |         |          |          |          |
| Arsenic (total)               | mg/kg As              | 41      | 66      | 12      | 11      | 13      | 32      | 33      | 97      | 195     | 14       | 34       | 27       |
| Boron (water soluble)         | mg/kg B               | 1.0     | 0.9     | 1.8     | <0.3    | 0.3     | 0.5     | 0.6     | 0.7     | 1.0     | 0.7      | 0.4      | 0.4      |
| Cadmium (total)               | mg/kg Cd              | 0.5     | <0.2    | 0.5     | 0.2     | <0.2    | 0.3     | 0.2     | 0.2     | 0.5     | 0.3      | 0.2      | 0.3      |
| Chromium (total)              | mg/kg Cr              | 6       | 11      | 19      | 17      | 19      | 6       | 28      | 16      | 33      | 20       | 15       | 14       |
| Copper (total)                | mg/kg Cu              | 31      | 30      | 23      | 41      | 24      | 25      | 18      | 36      | 66      | 17       | 37       | 55       |
| Lead (total)                  | mg/kg Pb              | 32      | 36      | 40      | 19      | 15      | 31      | 21      | 39      | 49      | 27       | 39       | 39       |
| Mercury (total)               | mg/kg Hg              | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 27      | 12      | 33      | 27      | 32      | 18      | 10      | 14      | 35      | 24       | 20       | 30       |
| Selenium (total)              | mg/kg Se              | 1.4     | 1.2     | <0.3    | <0.3    | <0.3    | 1.2     | <0.3    | 0.9     | <0.3    | <0.3     | 0.9      | 0.8      |
| Zinc (total)                  | mg/kg Zn              | 54      | 37      | 90      | 70      | 71      | 40      | 60      | 47      | 75      | 79       | 50       | - 62     |
| pH                            | units pH              | 2.7     | 6.0     | 4.6     | 4.7     | 4.4     | 6.7     | 5.5     | 3.8     | 4.8     | 5.4      | 4.5      | 4.8      |
| Magnesium (2:1 water soluble) | mg/l Mg               | 221     | 88      | -       | -       | -       | -       | -       | 64      | 23      | 90       | -        | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | 2683    | 2012    | -       | -       | -       | -       | -       | 2114    | 1983    | 25406    | -        | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 21354   | 22325   | 3713    | 1243    | 2272    | 2610    | 1399    | 22309   | 15945   | 5384     | 3433     | 2519     |
| Sulphide                      | mg/kg S <sup>2-</sup> | 35      | 31      | 31      | 31      | 35      | 31      | 35      | 31      | 174     | 69       | 162      | 149      |
| Sulphur (total)               | mg/kg S               | 10350   | 10140   | -       | -       | -       | -       | -       | 7874    | 6928    | 2231     | -        | -        |
| Cyanide (total)               | mg/kg CN              | <2      | <2      | <2      | <2      | <2      | <2      | <2      | <2      | 7.4     | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 280     | 180     | 400     | <50     | <50     | 280     | 180     | 90      | <50     | 220      | <50      | <50      |
| Loss on Ignition              | % w/w                 | 46.58   | 25.18   | -       | 7.72    | 3.72    | 43.64   | -       | 15.85   | 3.69    | -        | 19.68    | 19.72    |
| Organic matter content        | % w/w                 | 8.35    | 3.81    | 3.01    | 2.96    | 2.58    | 2.56    | 6.54    | 1.64    | 5.19    | 0.55     | 1.07     | 11.90    |
| Calorific Value               | kJ/kg                 | 11488   | 5142    | -       | -       | -       | 9808    | -       | -       | -       | -        | -        | -        |
| Phenols (total)               | mg/kg                 | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

# SOILS

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|                      | Lab Number   | 35566-1 | 35566-2 | 35566-3 | 35566-4 | 35566-5 | 35566-6 | 35566-7 | 35566-8 | 35566-9 | 35566-10 | 35566-11 | 35566-12 |
|----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                      | Sample id    | TP 16   | TP 16   | TP 16   | TP 17   | TP 17   | TP 18   | TP 18   | TP 19   | TP 19   | TP 19    | TP 20    | TP 20    |
|                      | Depth (m)    | 0.30    | 2.10    | 3.60    | 0.20    | 2.30    | 0.70    | 2.00    | 0.20    | 1.50    | 3.40     | 0.20     | 1.00     |
| <b>Determinands</b>  | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| Naphthalene          | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthylene       | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluorene             | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Phenanthrene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Anthracene           | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluoranthene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Pyrene               | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Chrysene             | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| PAH (total)          | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

# SOILS

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|                       | Lab Number   | 35566-1 | 35566-2 | 35566-3 | 35566-4 | 35566-5 | 35566-6 | 35566-7 | 35566-8 | 35566-9 | 35566-10 | 35566-11 | 35566-12 |
|-----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                       | Sample id    | TP 16   | TP 16   | TP 16   | TP 17   | TP 17   | TP 18   | TP 18   | TP 19   | TP 19   | TP 19    | TP 20    | TP 20    |
|                       | Depth (m)    | 0.30    | 2.10    | 3.60    | 0.20    | 2.30    | 0.70    | 2.00    | 0.20    | 1.50    | 3.40     | 0.20     | 1.00     |
| <b>Determinands</b>   | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH (C10-C28)         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH (C28-C40)         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C5-C7    | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C7-C8    | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C8-C10   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C10-C12  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C12-C16  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C16-C21  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C21-C35  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C5-C6   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C6-C8   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C8-C10  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C10-C12 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C12-C16 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C16-C21 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C21-C35 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
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|                               | Lab Number            | 35566-13 | 35566-14 | 35566-15 | 35566-16 | 35566-17 | 35566-18 | 35566-19 | 35566-20 | 35566-21 | 35566-22 | 35566-23 | 35566-24 |
|-------------------------------|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                               | Sample id             | TP 20    | TP 21    | TP 21    | TP 22    | TP 22    | TP 22    | TP 23    | TP 23    | TP 24    | TP 25    | TP 26    | TP 26    |
|                               | Depth (m)             | 2.00     | 1.00     | 4.00     | 0.50     | 2.00     | 4.00     | 2.50     | 4.00     | 0.60     | 1.00     | 0.20     | 3.00     |
| <b>Determinands</b>           | <b>Units</b>          |          |          |          |          |          |          |          |          |          |          |          |          |
| Arsenic (total)               | mg/kg As              | 12       | 29       | 6        | 10       | 11       | 9        | 33       | 8        | 29       | 62       | 47       | 43       |
| Boron (water soluble)         | mg/kg B               | 0.7      | 0.9      | 1.4      | 1.4      | 1.2      | 1.3      | 1.3      | 1.5      | 0.5      | 1.1      | 0.6      | 0.6      |
| Cadmium (total)               | mg/kg Cd              | 0.2      | 0.6      | 0.3      | 0.3      | 0.3      | 0.3      | 0.2      | 0.4      | 0.5      | 0.5      | 0.5      | 0.7      |
| Chromium (total)              | mg/kg Cr              | 10       | 14       | 24       | 15       | 15       | 20       | 11       | 19       | 24       | 18       | 24       | 40       |
| Copper (total)                | mg/kg Cu              | 24       | 78       | 17       | 28       | 28       | 12       | 50       | 11       | 49       | 72       | 45       | 66       |
| Lead (total)                  | mg/kg Pb              | 21       | 8        | 14       | 22       | 24       | 14       | 15       | 19       | 36       | 30       | 50       | 161      |
| Mercury (total)               | mg/kg Hg              | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 21       | 56       | 30       | 26       | 26       | 13       | 25       | 16       | 40       | 46       | 37       | 30       |
| Selenium (total)              | mg/kg Se              | 0.3      | 0.9      | <0.3     | <0.3     | <0.3     | <0.3     | 1.6      | <0.3     | <0.3     | <0.3     | 0.4      | 1.2      |
| Zinc (total)                  | mg/kg Zn              | 48       | 40       | 70       | 57       | 61       | 41       | 18       | 53       | 83       | 62       | 99       | 198      |
| pH                            | units pH              | 6.0      | 4.6      | 3.6      | 7.0      | 7.0      | 6.4      | 4.4      | 6.6      | 6.8      | 6.9      | 7.0      | 7.9      |
| Magnesium (2:1 water soluble) | mg/l Mg               | -        | 29       | 103      | -        | -        | 104      | 5.8      | -        | -        | 59       | -        | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | -        | 77       | 15       | -        | -        | 38       | 62       | -        | -        | 52       | -        | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 1227     | 31669    | 9961     | 1786     | 1325     | 5458     | 12364    | 1688     | 1251     | 18975    | 3614     | 1811     |
| Sulphide                      | mg/kg S <sup>2-</sup> | 230      | <10      | <10      | 73       | 75       | 81       | 77       | 87       | 73       | 77       | <10      | 73       |
| Sulphur (total)               | mg/kg S               | -        | 13050    | 3239     | -        | -        | 2448     | 6030     | -        | -        | 7654     | -        | -        |
| Cyanide (total)               | mg/kg CN              | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 360      | <50      | 120      | 80       | 200      | <50      | <50      | 460      | 90       | 50       | 110      | 840      |
| Loss on Ignition              | % w/w                 | 28.40    | 17.23    | -        | 19.76    | 13.79    | -        | 29.60    | -        | 20.65    | 18.24    | 10.34    | -        |
| Organic matter content        | % w/w                 | 9.36     | 9.41     | 5.52     | 0.51     | 3.27     | 6.20     | 3.58     | 6.39     | 2.25     | 7.65     | 7.64     | 4.90     |
| Calorific Value               | kJ/kg                 | 7507     | -        | -        | -        | -        | -        | 10963    | -        | -        | -        | -        | -        |
| Phenols (total)               | mg/kg                 | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.5     |

# SOILS

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|                      | Lab Number   | 35566-13 | 35566-14 | 35566-15 | 35566-16 | 35566-17 | 35566-18 | 35566-19 | 35566-20 | 35566-21 | 35566-22 | 35566-23 | 35566-24 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      | Sample id    | TP 20    | TP 21    | TP 21    | TP 22    | TP 22    | TP 22    | TP 23    | TP 23    | TP 24    | TP 25    | TP 26    | TP 26    |
|                      | Depth (m)    | 2.00     | 1.00     | 4.00     | 0.50     | 2.00     | 4.00     | 2.50     | 4.00     | 0.60     | 1.00     | 0.20     | 3.00     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 0.3      |
| Acenaphthylene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 1.0      |
| Acenaphthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 0.1      |
| Fluorene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 0.3      |
| Phenanthrene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 7.6      |
| Anthracene           | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 2.9      |
| Fluoranthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 9.9      |
| Pyrene               | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 7.9      |
| Benzo(a)anthracene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 5.1      |
| Chrysene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 1.0      |
| Benzo(b)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 4.1      |
| Benzo(k)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 2.7      |
| Benzo(a)pyrene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 4.0      |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 2.2      |
| Dibenz(ah)anthracene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 0.5      |
| Benzo(ghi)perylene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.1     |
| PAH (total)          | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 50       |

# SOILS

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Derwentside Business Centre  
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|                       | Lab Number   | 35566-13 | 35566-14 | 35566-15 | 35566-16 | 35566-17 | 35566-18 | 35566-19 | 35566-20 | 35566-21 | 35566-22 | 35566-23 | 35566-24 |
|-----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                       | Sample id    | TP 20    | TP 21    | TP 21    | TP 22    | TP 22    | TP 22    | TP 23    | TP 23    | TP 24    | TP 25    | TP 26    | TP 26    |
|                       | Depth (m)    | 2.00     | 1.00     | 4.00     | 0.50     | 2.00     | 4.00     | 2.50     | 4.00     | 0.60     | 1.00     | 0.20     | 3.00     |
| <b>Determinands</b>   | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <1       |
| TPH (C10-C28)         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 553      |
| TPH (C28-C40)         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 284      |
| TPH Aromatic C5-C7    | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.01    |
| TPH Aromatic C7-C8    | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.01    |
| TPH Aromatic C8-C10   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.01    |
| TPH Aromatic C10-C12  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <1       |
| TPH Aromatic C12-C16  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 5        |
| TPH Aromatic C16-C21  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 41       |
| TPH Aromatic C21-C35  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 27       |
| TPH Aliphatic C5-C6   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.1     |
| TPH Aliphatic C6-C8   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.1     |
| TPH Aliphatic C8-C10  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | <0.1     |
| TPH Aliphatic C10-C12 | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 33       |
| TPH Aliphatic C12-C16 | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 71       |
| TPH Aliphatic C16-C21 | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 232      |
| TPH Aliphatic C21-C35 | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 501      |

# LEACHATES

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                       | Lab Number             | 35566-14L |
|-----------------------|------------------------|-----------|
|                       | Sample id              | TP 21     |
|                       | Depth                  | 1.00      |
| <b>Determinands</b>   | <b>Units</b>           |           |
| Arsenic (total)       | mg/l As                | <0.001    |
| Boron (water soluble) | mg/l B                 | <0.03     |
| Cadmium (total)       | mg/l Cd                | <0.001    |
| Chromium (total)      | mg/l Cr                | <0.003    |
| Copper (total)        | mg/l Cu                | <0.004    |
| Lead (total)          | mg/l Pb                | <0.009    |
| Mercury (total)       | mg/l Hg                | <0.001    |
| Nickel (total)        | mg/l Ni                | 0.021     |
| Selenium (total)      | mg/l Se                | 0.002     |
| Zinc (total)          | mg/l Zn                | 0.044     |
| pH                    | units pH               | 4.8       |
| Sulphate              | mg/l SO <sub>4</sub>   | 780       |
| Sulphide              | ! mg/l S <sup>2-</sup> | <0.1      |
| Cyanide (total)       | mg/l CN                | <0.02     |
| Phenols (total)       | ! mg/l PhOH            | <0.0005   |
| PAH (total)           | ! mg/l                 | <0.0001   |
| TPH (C10-C40)         | ! mg/l                 | 0.10      |



PO BOX 100  
A16 9JN



ANALYTICAL TEST REPORT  
for  
Scott Doherty Associates  
Derwentside Business Centre,  
Consett Business Park, Consett,  
Co Durham, DH8 6BP

Contract name: North Gawber Colliery Site,  
Barnsley, Area 4,  
(Southern Lagoon Area)

Contract no: SDA/35567(2)

Copies to:  
Mark Doherty



**Comments:**

Determinations marked ! in this report are not included in the UKAS Accreditation schedule for the laboratory.

Unless otherwise stated, Chemtech Environmental Ltd were not responsible for sampling.

Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

All analysis was carried out using Chemtech Environmental Ltd methods unless otherwise agreed.

*Methods, procedures and performance data are available on request.*

Tests marked \$ have been subcontracted.

The test results in this report relate only to the actual samples on which testing has been performed.

*This report is confidential and is provided for use by the client and the use of their clients only.*

Date submitted for analysis: 30 October 2007

Date tests started: 30 October 2007

Client reference: -

**Report Approval**

Authorised by:



Name:

John Campbell

Position:

Director

Report date:

13 December 2007

This is a supplementary report to report number SDA/35567(1) issued 30 November 2007.

# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                               | Lab Number<br>Sample id<br>Depth (m) | 35567-1<br>TP 27<br>0.20 | 35567-2<br>TP 27<br>3.00 | 35567-3<br>TP 28<br>0.50 | 35567-4<br>TP 28<br>1.50 | 35567-5<br>TP 28<br>2.60 | 35567-6<br>TP 29<br>0.50 | 35567-7<br>TP 29<br>1.50 | 35567-8<br>TP 30<br>1.00 | 35567-9<br>TP 30<br>1.50 | 35567-10<br>TP 31<br>0.20 | 35567-11<br>TP 31<br>1.00 | 35567-12<br>TP 32<br>1.70 |
|-------------------------------|--------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|
| <b>Determinands</b>           | <b>Units</b>                         |                          |                          |                          |                          |                          |                          |                          |                          |                          |                           |                           |                           |
| Arsenic (total)               | mg/kg As                             | 61                       | 57                       | 7                        | 71                       | 5                        | 80                       | 10                       | 31                       | 6                        | 3                         | 5                         | 43                        |
| Boron (water soluble)         | mg/kg B                              | 1.0                      | 0.9                      | 0.5                      | 0.8                      | 0.3                      | 1.3                      | 0.5                      | 1.1                      | 0.5                      | 0.2                       | 0.4                       | 1.1                       |
| Cadmium (total)               | mg/kg Cd                             | 0.5                      | 0.7                      | 0.4                      | 0.3                      | 0.3                      | 0.4                      | 0.4                      | 0.7                      | 0.5                      | 0.4                       | 0.6                       | 0.4                       |
| Chromium (total)              | mg/kg Cr                             | 27                       | 17                       | 22                       | 19                       | 21                       | 17                       | 19                       | 19                       | 21                       | 20                        | 17                        | 16                        |
| Copper (total)                | mg/kg Cu                             | 29                       | 31                       | 19                       | 19                       | 16                       | 30                       | 19                       | 20                       | 12                       | 17                        | 10                        | 25                        |
| Lead (total)                  | mg/kg Pb                             | 46                       | 71                       | 18                       | 21                       | 12                       | 39                       | 14                       | 49                       | 20                       | 15                        | 16                        | 23                        |
| Mercury (total)               | mg/kg Hg                             | <0.5                     | <0.5                     | <0.5                     | <0.5                     | <0.5                     | <0.5                     | <0.5                     | <0.5                     | <0.5                     | <0.5                      | <0.5                      | <0.5                      |
| Nickel (total)                | mg/kg Ni                             | 25                       | 26                       | 27                       | 17                       | 23                       | 23                       | 26                       | 34                       | 9                        | 29                        | 17                        | 27                        |
| Selenium (total)              | mg/kg Se                             | <0.3                     | 0.8                      | <0.3                     | <0.3                     | <0.3                     | 1.2                      | <0.3                     | 0.4                      | 0.7                      | <0.3                      | 0.9                       | 0.7                       |
| Zinc (total)                  | mg/kg Zn                             | 76                       | 139                      | 70                       | 47                       | 57                       | 51                       | 63                       | 115                      | 45                       | 64                        | 56                        | 59                        |
| pH                            | units pH                             | 5.4                      | 6.7                      | 6.1                      | 4.2                      | 5.5                      | 4.2                      | 6.3                      | 5.5                      | 6.6                      | 6.0                       | 6.9                       | 6.7                       |
| Magnesium (2:1 water soluble) | mg/l Mg                              | 25                       | 95                       | -                        | 33                       | -                        | 130                      | 70                       | -                        | 34                       | -                         | -                         | 90                        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>                 | 1218                     | 1524                     | -                        | 318                      | -                        | 107                      | 145                      | -                        | 455                      | -                         | -                         | 1436                      |
| Sulphate (total)              | mg/kg SO <sub>4</sub>                | 16719                    | 16711                    | 963                      | 9615                     | 519                      | 20547                    | 10027                    | 1704                     | 7219                     | 1013                      | 1342                      | 5820                      |
| Sulphide                      | mg/kg S <sup>2-</sup>                | <10                      | 28                       | <10                      | <10                      | 73                       | <10                      | 28                       | <10                      | <10                      | <10                       | 12                        | 93                        |
| Sulphur (total)               | mg/kg S                              | 7457                     | 6726                     | -                        | 3430                     | -                        | 6902                     | 3324                     | -                        | 584                      | -                         | -                         | 8671                      |
| Cyanide (total)               | mg/kg CN                             | <2                       | <2                       | <2                       | <2                       | <2                       | <2                       | <2                       | <2                       | <2                       | <2                        | <2                        | <2                        |
| TEM                           | mg/kg                                | 80                       | 100                      | <50                      | <50                      | <50                      | 200                      | 130                      | 230                      | 70                       | 130                       | 130                       | 230                       |
| Loss on Ignition              | % w/w                                | 9.09                     | 15.08                    | 5.02                     | 7.54                     | 3.51                     | 20.47                    | 4.13                     | 10.41                    | -                        | 4.36                      | -                         | 3.91                      |
| Organic matter content        | % w/w                                | 1.81                     | 4.73                     | 1.81                     | 2.44                     | 1.39                     | 5.54                     | 1.37                     | 5.11                     | 1.04                     | 2.04                      | 0.75                      | 3.50                      |
| Calorific Value               | kJ/kg                                | -                        | -                        | -                        | -                        | -                        | -                        | -                        | -                        | -                        | -                         | -                         | -                         |
| Phenols (total)               | mg/kg                                | -                        | -                        | -                        | -                        | -                        | -                        | -                        | -                        | -                        | -                         | -                         | -                         |

# SOILS

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|                      | Lab Number   | 35567-1 | 35567-2 | 35567-3 | 35567-4 | 35567-5 | 35567-6 | 35567-7 | 35567-8 | 35567-9 | 35567-10 | 35567-11 | 35567-12 |
|----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                      | Sample id    | TP 27   | TP 27   | TP 28   | TP 28   | TP 28   | TP 29   | TP 29   | TP 30   | TP 30   | TP 31    | TP 31    | TP 32    |
|                      | Depth (m)    | 0.20    | 3.00    | 0.50    | 1.50    | 2.60    | 0.50    | 1.50    | 1.00    | 1.50    | 0.20     | 1.00     | 1.70     |
| <b>Determinands</b>  | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| Naphthalene          | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthylene       | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluorene             | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Phenanthrene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Anthracene           | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluoranthene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Pyrene               | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Chrysene             | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| PAH (total)          | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

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|                       | Lab Number   | 35567-1 | 35567-2 | 35567-3 | 35567-4 | 35567-5 | 35567-6 | 35567-7 | 35567-8 | 35567-9 | 35567-10 | 35567-11 | 35567-12 |
|-----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                       | Sample id    | TP 27   | TP 27   | TP 28   | TP 28   | TP 28   | TP 29   | TP 29   | TP 30   | TP 30   | TP 31    | TP 31    | TP 32    |
|                       | Depth (m)    | 0.20    | 3.00    | 0.50    | 1.50    | 2.60    | 0.50    | 1.50    | 1.00    | 1.50    | 0.20     | 1.00     | 1.70     |
| <b>Determinands</b>   | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH (C10-C28)         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH (C28-C40)         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C5-C7    | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C7-C8    | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C8-C10   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C10-C12  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C12-C16  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C16-C21  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C21-C35  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C5-C6   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C6-C8   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C8-C10  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C10-C12 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C12-C16 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C16-C21 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C21-C35 | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

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|                               | Lab Number<br>Sample id<br>Depth (m) | 35567-13<br>TP 33<br>0.20 | 35567-14<br>TP 33<br>1.20 | 35567-15<br>TP 34<br>0.20 | 35567-16<br>TP 34<br>3.20 | 35567-17<br>TP 35<br>2.50 | 35567-18<br>TP 36<br>0.20 | 35567-19<br>TP 36<br>1.30 | 35567-20<br>TP 36<br>3.60 | 35567-21<br>TP 37<br>2.00 | 35567-22<br>TP 40<br>0.20 | 35567-23<br>TP 40<br>1.70 | 35567-24<br>TP 42<br>1.30 |
|-------------------------------|--------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| <b>Determinands</b>           | <b>Units</b>                         |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |
| Arsenic (total)               | mg/kg As                             | 65                        | 34                        | 132                       | 52                        | 30                        | 9                         | 21                        | 6                         | 5                         | <1                        | 4                         | 4                         |
| Boron (water soluble)         | mg/kg B                              | 0.4                       | 0.8                       | 1.4                       | 1.4                       | 0.8                       | 0.3                       | 0.8                       | 0.7                       | 0.6                       | 0.6                       | 0.6                       | 0.3                       |
| Cadmium (total)               | mg/kg Cd                             | 0.4                       | 0.4                       | 0.4                       | 0.5                       | 0.4                       | 0.3                       | 0.4                       | 0.4                       | <0.2                      | <0.2                      | 0.3                       | 0.3                       |
| Chromium (total)              | mg/kg Cr                             | 17                        | 12                        | 15                        | 16                        | 15                        | 13                        | 16                        | 17                        | 2                         | 2                         | 17                        | 17                        |
| Copper (total)                | mg/kg Cu                             | 36                        | 22                        | 29                        | 24                        | 24                        | 14                        | 29                        | 9                         | 9                         | 11                        | 12                        | 12                        |
| Lead (total)                  | mg/kg Pb                             | 44                        | 31                        | 31                        | 33                        | 24                        | 24                        | 22                        | 18                        | 25                        | 11                        | 10                        | 8                         |
| Mercury (total)               | mg/kg Hg                             | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      | <0.5                      |
| Nickel (total)                | mg/kg Ni                             | 19                        | 23                        | 14                        | 27                        | 26                        | 18                        | 26                        | 13                        | 7                         | 13                        | 12                        | 22                        |
| Selenium (total)              | mg/kg Se                             | 0.8                       | 0.6                       | 1.9                       | 0.6                       | 0.4                       | 0.4                       | 0.4                       | 0.5                       | <0.3                      | <0.3                      | <0.3                      | <0.3                      |
| Zinc (total)                  | mg/kg Zn                             | 62                        | 63                        | 46                        | 68                        | 64                        | 30                        | 65                        | 50                        | 23                        | 34                        | 40                        | 50                        |
| pH                            | units pH                             | 3.4                       | 7.7                       | 3.4                       | 6.6                       | 6.9                       | 7.9                       | 6.6                       | 7.3                       | 4.3                       | 4.7                       | 6.5                       | 7.9                       |
| Magnesium (2:1 water soluble) | mg/l Mg                              | 16                        | -                         | 132                       | 321                       | 91                        | -                         | 65                        | -                         | -                         | -                         | -                         | -                         |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>                 | 342                       | -                         | 2573                      | 3192                      | 1131                      | -                         | 951                       | -                         | -                         | -                         | -                         | -                         |
| Sulphate (total)              | mg/kg SO <sub>4</sub>                | 9442                      | 4371                      | 31948                     | 15616                     | 6182                      | 1762                      | 7285                      | 1432                      | 4536                      | 1556                      | 938                       | 527                       |
| Sulphide                      | mg/kg S <sup>2-</sup>                | 36                        | 32                        | <10                       | 16                        | 16                        | 77                        | 32                        | 20                        | 12                        | <10                       | <10                       | <10                       |
| Sulphur (total)               | mg/kg S                              | 3444                      | -                         | 8586                      | 8235                      | 6496                      | -                         | 3217                      | -                         | -                         | -                         | -                         | -                         |
| Cyanide (total)               | mg/kg CN                             | <2                        | <2                        | 4.6                       | <2                        | <2                        | <2                        | <2                        | <2                        | <2                        | <2                        | <2                        | <2                        |
| TEM                           | mg/kg                                | 130                       | 160                       | 170                       | 70                        | 150                       | 1470                      | 170                       | 160                       | 240                       | 160                       | 200                       | 90                        |
| Loss on Ignition              | % w/w                                | 15.39                     | 15.22                     | 20.14                     | 16.99                     | 14.83                     | 5.56                      | 15.67                     | -                         | 65.75                     | 41.09                     | -                         | -                         |
| Organic matter content        | % w/w                                | 4.68                      | 5.08                      | 5.33                      | 5.91                      | 4.16                      | 2.40                      | 5.69                      | 2.03                      | 14.95                     | 8.55                      | 1.38                      | 0.38                      |
| Calorific Value               | kJ/kg                                | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | 13389                     | 7875                      | -                         | -                         |
| Phenols (total)               | mg/kg                                | -                         | -                         | -                         | -                         | -                         | <0.5                      | -                         | -                         | -                         | -                         | -                         | -                         |

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|                      | Lab Number   | 35567-13 | 35567-14 | 35567-15 | 35567-16 | 35567-17 | 35567-18 | 35567-19 | 35567-20 | 35567-21 | 35567-22 | 35567-23 | 35567-24 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      | Sample id    | TP 33    | TP 33    | TP 34    | TP 34    | TP 35    | TP 36    | TP 36    | TP 36    | TP 37    | TP 40    | TP 40    | TP 42    |
|                      | Depth (m)    | 0.20     | 1.20     | 0.20     | 3.20     | 2.50     | 0.20     | 1.30     | 3.60     | 2.00     | 0.20     | 1.70     | 1.30     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | -        | -        | -        | -        | 0.8      | -        | -        | -        | -        | -        | -        |
| Acenaphthylene       | ! mg/kg      | -        | -        | -        | -        | -        | 0.9      | -        | -        | -        | -        | -        | -        |
| Acenaphthene         | ! mg/kg      | -        | -        | -        | -        | -        | 0.3      | -        | -        | -        | -        | -        | -        |
| Fluorene             | ! mg/kg      | -        | -        | -        | -        | -        | 0.3      | -        | -        | -        | -        | -        | -        |
| Phenanthrene         | ! mg/kg      | -        | -        | -        | -        | -        | 2.0      | -        | -        | -        | -        | -        | -        |
| Anthracene           | ! mg/kg      | -        | -        | -        | -        | -        | 1.6      | -        | -        | -        | -        | -        | -        |
| Fluoranthene         | ! mg/kg      | -        | -        | -        | -        | -        | 5.0      | -        | -        | -        | -        | -        | -        |
| Pyrene               | ! mg/kg      | -        | -        | -        | -        | -        | 4.8      | -        | -        | -        | -        | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | -        | -        | -        | -        | -        | 3.8      | -        | -        | -        | -        | -        | -        |
| Chrysene             | ! mg/kg      | -        | -        | -        | -        | -        | 1.2      | -        | -        | -        | -        | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | 5.3      | -        | -        | -        | -        | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | 2.7      | -        | -        | -        | -        | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | -        | -        | -        | -        | -        | 5.0      | -        | -        | -        | -        | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | -        | -        | -        | -        | 3.9      | -        | -        | -        | -        | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -        | -        | -        | -        | -        | 0.7      | -        | -        | -        | -        | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -        | -        | -        | -        | -        | 3.6      | -        | -        | -        | -        | -        | -        |
| PAH (total)          | ! mg/kg      | -        | -        | -        | -        | -        | 42       | -        | -        | -        | -        | -        | -        |

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|                       | Lab Number   | 35567-13 | 35567-14 | 35567-15 | 35567-16 | 35567-17 | 35567-18 | 35567-19 | 35567-20 | 35567-21 | 35567-22 | 35567-23 | 35567-24 |
|-----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                       | Sample id    | TP 33    | TP 33    | TP 34    | TP 34    | TP 35    | TP 36    | TP 36    | TP 36    | TP 37    | TP 40    | TP 40    | TP 42    |
|                       | Depth (m)    | 0.20     | 1.20     | 0.20     | 3.20     | 2.50     | 0.20     | 1.30     | 3.60     | 2.00     | 0.20     | 1.70     | 1.30     |
| <b>Determinands</b>   | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | -        | -        | -        | -        | -        | <1       | -        | -        | -        | -        | -        | -        |
| TPH (C10-C28)         | ! mg/kg      | -        | -        | -        | -        | -        | 410      | -        | -        | -        | -        | -        | -        |
| TPH (C28-C40)         | ! mg/kg      | -        | -        | -        | -        | -        | 492      | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C5-C7    | ! mg/kg      | -        | -        | -        | -        | -        | 0.01     | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C7-C8    | ! mg/kg      | -        | -        | -        | -        | -        | <0.01    | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C8-C10   | ! mg/kg      | -        | -        | -        | -        | -        | <0.01    | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C10-C12  | ! mg/kg      | -        | -        | -        | -        | -        | 2        | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C12-C16  | ! mg/kg      | -        | -        | -        | -        | -        | 4        | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C16-C21  | ! mg/kg      | -        | -        | -        | -        | -        | 19       | -        | -        | -        | -        | -        | -        |
| TPH Aromatic C21-C35  | ! mg/kg      | -        | -        | -        | -        | -        | 37       | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C5-C6   | ! mg/kg      | -        | -        | -        | -        | -        | <0.1     | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C6-C8   | ! mg/kg      | -        | -        | -        | -        | -        | <0.1     | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C8-C10  | ! mg/kg      | -        | -        | -        | -        | -        | <0.1     | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C10-C12 | ! mg/kg      | -        | -        | -        | -        | -        | 16       | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C12-C16 | ! mg/kg      | -        | -        | -        | -        | -        | 37       | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C16-C21 | ! mg/kg      | -        | -        | -        | -        | -        | 75       | -        | -        | -        | -        | -        | -        |
| TPH Aliphatic C21-C35 | ! mg/kg      | -        | -        | -        | -        | -        | 774      | -        | -        | -        | -        | -        | -        |



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|                               | Lab Number            | 35567-25 | 35567-26 | 35567-27 | 35567-28 | 35567-29 | 35567-30 | 35567-31 |
|-------------------------------|-----------------------|----------|----------|----------|----------|----------|----------|----------|
|                               | Sample id             | TP 43    | TP 43    | TP 44    | TP 44    | TP 45    | TP 46    | TP 46    |
|                               | Depth (m)             | 1.00     | 2.00     | 0.20     | 3.20     | 0.20     | 1.40     | 2.00     |
| <b>Determinands</b>           | <b>Units</b>          |          |          |          |          |          |          |          |
| Arsenic (total)               | mg/kg As              | 5        | 8        | 75       | 17       | 14       | 12       | 1        |
| Boron (water soluble)         | mg/kg B               | 1.2      | 1.2      | 0.6      | 1.2      | 2.0      | 0.8      | 0.5      |
| Cadmium (total)               | mg/kg Cd              | 0.2      | 0.5      | 0.3      | 0.4      | 1.0      | 0.4      | 0.3      |
| Chromium (total)              | mg/kg Cr              | 10       | 14       | 13       | 15       | 49       | 15       | 17       |
| Copper (total)                | mg/kg Cu              | 15       | 23       | 22       | 26       | 35       | 20       | 10       |
| Lead (total)                  | mg/kg Pb              | 16       | 56       | 30       | 28       | 93       | 29       | 9        |
| Mercury (total)               | mg/kg Hg              | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 20       | 28       | 18       | 28       | 29       | 27       | 22       |
| Selenium (total)              | mg/kg Se              | 0.3      | 0.6      | 1.5      | 0.4      | 0.6      | <0.3     | <0.3     |
| Zinc (total)                  | mg/kg Zn              | 44       | 62       | 48       | 73       | 186      | 62       | 50       |
| pH                            | units pH              | 7.6      | 8.4      | 4.1      | 7.3      | 6.5      | 7.5      | 7.0      |
| Magnesium (2:1 water soluble) | mg/l Mg               | -        | -        | -        | -        | -        | -        | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | -        | -        | -        | -        | -        | -        | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 1630     | 856      | 4404     | 3033     | 2181     | 922      | 453      |
| Sulphide                      | mg/kg S <sup>2-</sup> | <10      | <10      | <10      | <10      | <10      | 12       | 105      |
| Sulphur (total)               | mg/kg S               | -        | -        | -        | -        | -        | -        | -        |
| Cyanide (total)               | mg/kg CN              | <2       | <2       | <2       | <2       | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 170      | 290      | 170      | 310      | 5860     | 160      | 110      |
| Loss on Ignition              | % w/w                 | 19.77    | 18.64    | 15.9     | 16.98    | 21.69    | 9.26     | -        |
| Organic matter content        | % w/w                 | 4.73     | 4.51     | 4.03     | 5.19     | 9.31     | 2.82     | 1.16     |
| Calorific Value               | kJ/kg                 | -        | -        | -        | -        | -        | -        | -        |
| Phenols (total)               | mg/kg                 | -        | -        | -        | -        | <0.5     | -        | -        |

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|                      | Lab Number   | 35567-25 | 35567-26 | 35567-27 | 35567-28 | 35567-29 | 35567-30 | 35567-31 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|
|                      | Sample id    | TP 43    | TP 43    | TP 44    | TP 44    | TP 45    | TP 46    | TP 46    |
|                      | Depth (m)    | 1.00     | 2.00     | 0.20     | 3.20     | 0.20     | 1.40     | 2.00     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | -        | -        | -        | 0.4      | -        | -        |
| Acenaphthylene       | ! mg/kg      | -        | -        | -        | -        | 0.2      | -        | -        |
| Acenaphthene         | ! mg/kg      | -        | -        | -        | -        | 0.1      | -        | -        |
| Fluorene             | ! mg/kg      | -        | -        | -        | -        | 0.1      | -        | -        |
| Phenanthrene         | ! mg/kg      | -        | -        | -        | -        | 1.7      | -        | -        |
| Anthracene           | ! mg/kg      | -        | -        | -        | -        | 0.6      | -        | -        |
| Fluoranthene         | ! mg/kg      | -        | -        | -        | -        | 3.3      | -        | -        |
| Pyrene               | ! mg/kg      | -        | -        | -        | -        | 3.4      | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | -        | -        | -        | -        | 1.8      | -        | -        |
| Chrysene             | ! mg/kg      | -        | -        | -        | -        | 1.8      | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -        | -        | -        | -        | 3.1      | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -        | -        | -        | -        | 1.5      | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | -        | -        | -        | -        | 2.7      | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | -        | -        | -        | 2.3      | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -        | -        | -        | -        | 0.1      | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -        | -        | -        | -        | 1.8      | -        | -        |
| PAH (total)          | ! mg/kg      | -        | -        | -        | -        | 25       | -        | -        |

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|                       | Lab Number   | 35567-25 | 35567-26 | 35567-27 | 35567-28 | 35567-29 | 35567-30 | 35567-31 |
|-----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|
|                       | Sample id    | TP 43    | TP 43    | TP 44    | TP 44    | TP 45    | TP 46    | TP 46    |
|                       | Depth (m)    | 1.00     | 2.00     | 0.20     | 3.20     | 0.20     | 1.40     | 2.00     |
| <b>Determinands</b>   | <b>Units</b> |          |          |          |          |          |          |          |
| TPH (C5-C10)          | mg/kg        | -        | -        | -        | -        | <1       | -        | -        |
| TPH (C10-C28)         | mg/kg        | -        | -        | -        | -        | 831      | -        | -        |
| TPH (C28-C40)         | mg/kg        | -        | -        | -        | -        | 1164     | -        | -        |
| TPH Aromatic C5-C7    | mg/kg        | -        | -        | -        | -        | <0.01    | -        | -        |
| TPH Aromatic C7-C8    | mg/kg        | -        | -        | -        | -        | <0.01    | -        | -        |
| TPH Aromatic C8-C10   | mg/kg        | -        | -        | -        | -        | <0.01    | -        | -        |
| TPH Aromatic C10-C12  | mg/kg        | -        | -        | -        | -        | <1       | -        | -        |
| TPH Aromatic C12-C16  | mg/kg        | -        | -        | -        | -        | <1       | -        | -        |
| TPH Aromatic C16-C21  | mg/kg        | -        | -        | -        | -        | 11       | -        | -        |
| TPH Aromatic C21-C35  | mg/kg        | -        | -        | -        | -        | 18       | -        | -        |
| TPH Aliphatic C5-C6   | mg/kg        | -        | -        | -        | -        | <0.1     | -        | -        |
| TPH Aliphatic C6-C8   | mg/kg        | -        | -        | -        | -        | <0.1     | -        | -        |
| TPH Aliphatic C8-C10  | mg/kg        | -        | -        | -        | -        | <0.1     | -        | -        |
| TPH Aliphatic C10-C12 | mg/kg        | -        | -        | -        | -        | 20       | -        | -        |
| TPH Aliphatic C12-C16 | mg/kg        | -        | -        | -        | -        | 53       | -        | -        |
| TPH Aliphatic C16-C21 | mg/kg        | -        | -        | -        | -        | 154      | -        | -        |
| TPH Aliphatic C21-C35 | mg/kg        | -        | -        | -        | -        | 1768     | -        | -        |

# LEACHATES

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                       |                        |           |
|-----------------------|------------------------|-----------|
|                       | Lab Number             | 35567-18L |
|                       | Sample id              | TP 36     |
|                       | Depth                  | 0.20      |
| <b>Determinands</b>   | <b>Units</b>           |           |
| Arsenic (total)       | mg/l As                | <0.001    |
| Boron (water soluble) | mg/l B                 | <0.03     |
| Cadmium (total)       | mg/l Cd                | <0.001    |
| Chromium (total)      | mg/l Cr                | <0.003    |
| Copper (total)        | mg/l Cu                | <0.004    |
| Lead (total)          | mg/l Pb                | <0.009    |
| Mercury (total)       | mg/l Hg                | <0.001    |
| Nickel (total)        | mg/l Ni                | <0.003    |
| Selenium (total)      | mg/l Se                | <0.001    |
| Zinc (total)          | mg/l Zn                | <0.020    |
| pH                    | units pH               | 7.1       |
| Sulphate              | mg/l SO <sub>4</sub>   | 56        |
| Sulphide              | ! mg/l S <sup>2-</sup> | <0.1      |
| Cyanide (total)       | mg/l CN                | <0.02     |
| Phenols (total)       | ! mg/l PhOH            | <0.0005   |
| PAH (total)           | ! mg/l                 | 0.0004    |
| TPH (C10-C40)         | ! mg/l                 | 0.06      |

ANALYTICAL TEST REPORT

for

Scott Doherty Associates

Derwentside Business Centre,

Consett Business Park, Consett,

Co Durham, DH8 6BP

Contract name: North Gawber Colliery Site,  
Barnsley, Area 5,  
(North-East Industrialised  
Area)

Contract no: SDA/35568(3)

Copies to:  
Mark Doherty

**Comments:**

Determinations marked ! in this report are not included in the UKAS Accreditation schedule for the laboratory.

Unless otherwise stated, Chemtech Environmental Ltd were not responsible for sampling.

Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

All analysis was carried out using Chemtech Environmental Ltd methods unless otherwise agreed.

Methods, procedures and performance data are available on request.

Tests marked \$ have been subcontracted.

The test results in this report relate only to the actual samples on which testing has been performed.

This report is confidential and is provided for use by the client and the use of their clients only.

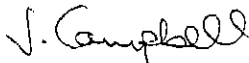
Date submitted for analysis: 30 October 2007

Date tests started: 30 October 2007

Client reference: -

**Report Approval**

Authorised by:



Name:

John Campbell

Position:

Director

Report date:

08 February 2008

This is a supplementary report to report number SDA/35568(2) issued 13 December 2007.

# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                               | Lab Number            | 35568-1 | 35568-2 | 35568-3 | 35568-4 | 35568-5 | 35568-6 | 35568-7 | 35568-8 | 35568-9 | 35568-10 | 35568-11 | 35568-12 |
|-------------------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                               | Sample id             | TP 47   | TP 48   | TP 48   | TP 50   | TP 50   | TP 52   | TP 53   | TP 54   | TP 54   | TP 55    | TP 55    | TP 55    |
|                               | Depth (m)             | 0.50    | 0.50    | 2.00    | 0.50    | 4.50    | 1.40    | 2.50    | 0.70    | 3.50    | 0.20     | 2.00     | 3.50     |
| <b>Determinands</b>           | <b>Units</b>          |         |         |         |         |         |         |         |         |         |          |          |          |
| Arsenic (total)               | mg/kg As              | 43      | 41      | 78      | 73      | 42      | 107     | 179     | 42      | 121     | 9        | 3        | 4        |
| Boron (water soluble)         | mg/kg B               | 0.6     | 0.4     | 0.6     | 0.9     | 1.4     | 0.9     | 1.7     | 1.5     | 0.7     | 0.9      | 1.2      | 0.7      |
| Cadmium (total)               | mg/kg Cd              | <0.2    | 0.6     | 0.8     | <0.2    | <0.2    | <0.2    | 0.2     | 0.3     | <0.2    | <0.2     | <0.2     | <0.2     |
| Chromium (total)              | mg/kg Cr              | 16      | 9       | 13      | 21      | 39      | 10      | 25      | 30      | 22      | 12       | 5        | 13       |
| Copper (total)                | mg/kg Cu              | 56      | 45      | 45      | 48      | 328     | 29      | 79      | 52      | 59      | 32       | 8        | 8        |
| Lead (total)                  | mg/kg Pb              | 34      | 98      | 70      | 160     | 17      | 36      | 58      | 39      | 109     | 23       | 7        | 9        |
| Mercury (total)               | mg/kg Hg              | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5    | <0.5     | <0.5     | 0.7      |
| Nickel (total)                | mg/kg Ni              | 20      | 16      | 20      | 20      | 25      | 3       | 30      | 44      | 38      | 24       | 7        | 10       |
| Selenium (total)              | mg/kg Se              | 1.0     | 1.3     | 1.1     | 0.6     | 1.0     | 1.1     | <0.3    | <0.3    | 0.9     | <0.3     | <0.3     | <0.3     |
| Zinc (total)                  | mg/kg Zn              | 374     | 228     | 283     | 52      | 25      | 20      | 52      | 54      | 48      | 47       | 6        | 27       |
| pH                            | units pH              | 4.1     | 7.0     | 7.7     | 6.7     | 6.7     | 6.5     | 6.1     | 6.2     | 4.1     | 7.5      | 6.7      | 7.9      |
| Magnesium (2:1 water soluble) | mg/l Mg               | 6.2     | 17      | 37      | -       | 50      | 29      | 32      | 39      | 37      | -        | 87       | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | 261     | 323     | 896     | -       | 2229    | 562     | 1884    | 1317    | 1216    | -        | 1963     | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 6083    | 7096    | 14126   | 4692    | 40855   | 18110   | 66589   | 9640    | 19806   | 1539     | 13871    | 3013     |
| Sulphide                      | mg/kg S <sup>2-</sup> | <10     | <10     | <10     | <10     | 12      | <10     | <10     | <10     | <10     | <10      | <10      | <10      |
| Sulphur (total)               | mg/kg S               | 5333    | 5272    | 8599    | -       | 14780   | 10060   | 23120   | 7101    | 11790   | -        | 8101     | -        |
| Cyanide (total)               | mg/kg CN              | <2      | <2      | <2      | <2      | <2      | <2      | 5.2     | <2      | 4.2     | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 870     | 150     | 100     | 420     | 50      | 180     | 50      | 190     | 160     | 220      | 200      | 200      |
| Loss on Ignition              | % w/w                 | 20.59   | 7.02    | 19.26   | 22.26   | 27.42   | 20.23   | -       | 2.84    | 7.02    | -        | 6.26     | 5.13     |
| Organic matter content        | % w/w                 | 7.18    | 4.18    | 3.97    | 7.90    | 6.31    | 5.01    | 3.20    | 1.65    | 5.10    | 5.59     | 4.69     | 1.41     |
| Calorific Value               | kJ/kg                 | -       | -       | -       | -       | 7411    | -       | -       | -       | -       | -        | -        | -        |
| Phenols (total)               | mg/kg                 | <0.5    | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Asbestos                      | \$                    | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

NAF=Non Asbestos Fibres

Contract number: SDA/35568(3)  
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# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                      | Lab Number   | 35568-1 | 35568-2 | 35568-3 | 35568-4 | 35568-5 | 35568-6 | 35568-7 | 35568-8 | 35568-9 | 35568-10 | 35568-11 | 35568-12 |
|----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                      | Sample id    | TP 47   | TP 48   | TP 48   | TP 50   | TP 50   | TP 52   | TP 53   | TP 54   | TP 54   | TP 55    | TP 55    | TP 55    |
|                      | Depth (m)    | 0.50    | 0.50    | 2.00    | 0.50    | 4.50    | 1.40    | 2.50    | 0.70    | 3.50    | 0.20     | 2.00     | 3.50     |
| <b>Determinands</b>  | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| Naphthalene          | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthylene       | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Acenaphthene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluorene             | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Phenanthrene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Anthracene           | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Fluoranthene         | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Pyrene               | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Chrysene             | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| PAH (total)          | ! mg/kg      | 8.6     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |



# SOILS

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|                       | Lab Number   | 35568-1 | 35568-2 | 35568-3 | 35568-4 | 35568-5 | 35568-6 | 35568-7 | 35568-8 | 35568-9 | 35568-10 | 35568-11 | 35568-12 |
|-----------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
|                       | Sample id    | TP 47   | TP 48   | TP 48   | TP 50   | TP 50   | TP 52   | TP 53   | TP 54   | TP 54   | TP 55    | TP 55    | TP 55    |
|                       | Depth (m)    | 0.50    | 0.50    | 2.00    | 0.50    | 4.50    | 1.40    | 2.50    | 0.70    | 3.50    | 0.20     | 2.00     | 3.50     |
| <b>Determinands</b>   | <b>Units</b> |         |         |         |         |         |         |         |         |         |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | <1      | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH (C10-C28)         | ! mg/kg      | 647     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH (C28-C40)         | ! mg/kg      | 413     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C5-C7    | ! mg/kg      | 0.06    | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C7-C8    | ! mg/kg      | <0.01   | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C8-C10   | ! mg/kg      | <0.01   | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C10-C12  | ! mg/kg      | <1      | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C12-C16  | ! mg/kg      | 3       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C16-C21  | ! mg/kg      | 5       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aromatic C21-C35  | ! mg/kg      | 6       | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C5-C6   | ! mg/kg      | 0.1     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C6-C8   | ! mg/kg      | 0.1     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C8-C10  | ! mg/kg      | <0.1    | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C10-C12 | ! mg/kg      | 97      | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C12-C16 | ! mg/kg      | 202     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C16-C21 | ! mg/kg      | 293     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |
| TPH Aliphatic C21-C35 | ! mg/kg      | 468     | -       | -       | -       | -       | -       | -       | -       | -       | -        | -        | -        |

NAF=Non Asbestos Fibres

Contract number: SDA/35568(3)  
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# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                               | Lab Number            | 35568-13 | 35568-14 | 35568-15 | 35568-16 | 35568-17 | 35568-18 | 35568-19 | 35568-20 | 35568-21 | 35568-22 | 35568-23 | 35568-24 |
|-------------------------------|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                               | Sample Id             | TP 56    | TP 57    | TP 58    | TP 58    | TP 59    | TP 59    | TP 59    | TP 60    | TP 60    | TP 62    | TP 63    | TP 63    |
|                               | Depth (m)             | 0.30     | 2.00     | 1.50     | 2.80     | 0.20     | 2.00     | 2.40     | 0.20     | 1.10     | 2.00     | 0.10     | 3.00     |
| <b>Determinands</b>           | <b>Units</b>          |          |          |          |          |          |          |          |          |          |          |          |          |
| Arsenic (total)               | mg/kg As              | 188      | 3        | 30       | 62       | 22       | 21       | 3        | 10       | 12       | 58       | 30       | 5        |
| Boron (water soluble)         | mg/kg B               | 0.3      | 0.6      | 0.9      | 1.4      | 0.9      | 0.9      | 0.3      | 0.5      | 0.9      | 1.3      | 0.7      | 0.8      |
| Cadmium (total)               | mg/kg Cd              | <0.2     | <0.2     | 0.2      | 0.4      | 0.2      | <0.2     | <0.2     | 0.2      | <0.2     | 0.3      | <0.2     | <0.2     |
| Chromium (total)              | mg/kg Cr              | 25       | 6        | 14       | 30       | 17       | 17       | 11       | 17       | 11       | 39       | 10       | 11       |
| Copper (total)                | mg/kg Cu              | 77       | 8        | 38       | 145      | 47       | 35       | 8        | 25       | 35       | 73       | 51       | 12       |
| Lead (total)                  | mg/kg Pb              | 47       | 8        | 29       | 53       | 27       | 42       | 8        | 37       | 22       | 48       | 41       | 13       |
| Mercury (total)               | ! mg/kg Hg            | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 5        | 5        | 26       | 76       | 29       | 37       | 7        | 12       | 22       | 49       | 19       | 15       |
| Selenium (total)              | mg/kg Se              | 1.6      | <0.3     | 0.3      | 0.5      | <0.3     | <0.3     | <0.3     | <0.3     | 0.4      | 1.0      | 0.9      | <0.3     |
| Zinc (total)                  | mg/kg Zn              | 14       | 10       | 78       | 1706     | 59       | 67       | 40       | 61       | 47       | 47       | 50       | 42       |
| pH                            | units pH              | 3.5      | 4.4      | 6.7      | 6.7      | 7.0      | 6.4      | 6.5      | 7.2      | 6.6      | 6.2      | 11.1     | 4.2      |
| Magnesium (2:1 water soluble) | mg/l Mg               | 2.9      | 85       | 31       | 47       | -        | -        | -        | -        | -        | 18       | -        | 8.8      |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | 30       | 1663     | 1114     | 1228     | -        | -        | -        | -        | -        | 693      | -        | 715      |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 28582    | 12060    | 7154     | 6297     | 3350     | 996      | 375      | 2198     | 3457     | 12900    | 4470     | 6577     |
| Sulphide                      | mg/kg S <sup>2-</sup> | <10      | <10      | <10      | 242      | 65       | <10      | <10      | 12       | <10      | <10      | <10      | 81       |
| Sulphur (total)               | ! mg/kg S             | 13160    | 3216     | 4743     | 5796     | -        | -        | -        | -        | -        | 12040    | -        | 2217     |
| Cyanide (total)               | mg/kg CN              | 8.6      | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 60       | 150      | 820      | 1980     | 410      | 240      | 60       | 340      | 250      | 810      | 810      | 140      |
| Loss on Ignition              | % w/w                 | 8.75     | 20.02    | 21.05    | 8.15     | 11.14    | 8.31     | -        | -        | 14.17    | 10.69    | 23.47    | -        |
| Organic matter content        | % w/w                 | 5.44     | 1.04     | 8.79     | 6.20     | 6.27     | 2.22     | 0.92     | 2.47     | 8.85     | 2.37     | 5.55     | 0.60     |
| Calorific Value               | ! kJ/kg               | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Phenols (total)               | mg/kg                 | -        | -        | <0.5     | <0.5     | -        | -        | -        | -        | -        | <0.5     | <0.5     | -        |
| Asbestos                      | \$                    | -        | -        | -        | -        | -        | -        | -        | -        | NAF      | -        | -        | -        |

NAF=Non Asbestos Fibres

Contract number: SDA/35568(3)  
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# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                      | Lab Number   | 35568-13 | 35568-14 | 35568-15 | 35568-16 | 35568-17 | 35568-18 | 35568-19 | 35568-20 | 35568-21 | 35568-22 | 35568-23 | 35568-24 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      | Sample id    | TP 56    | TP 57    | TP 58    | TP 58    | TP 59    | TP 59    | TP 59    | TP 60    | TP 60    | TP 62    | TP 63    | TP 63    |
|                      | Depth (m)    | 0.30     | 2.00     | 1.50     | 2.80     | 0.20     | 2.00     | 2.40     | 0.20     | 1.10     | 2.00     | 0.10     | 3.00     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Acenaphthylene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Acenaphthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Fluorene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Phenanthrene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Anthracene           | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Fluoranthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Pyrene               | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Benzo(a)anthracene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Chrysene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Benzo(a)pyrene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| PAH (total)          | ! mg/kg      | -        | -        | 3.1      | 9.3      | -        | -        | -        | -        | -        | <5       | 11       | -        |

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|                       | Lab Number   | 35568-13 | 35568-14 | 35568-15 | 35568-16 | 35568-17 | 35568-18 | 35568-19 | 35568-20 | 35568-21 | 35568-22 | 35568-23 | 35568-24 |
|-----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                       | Sample id    | TP 56    | TP 57    | TP 58    | TP 58    | TP 59    | TP 59    | TP 59    | TP 60    | TP 60    | TP 62    | TP 63    | TP 63    |
|                       | Depth (m)    | 0.30     | 2.00     | 1.50     | 2.80     | 0.20     | 2.00     | 2.40     | 0.20     | 1.10     | 2.00     | 0.10     | 3.00     |
| <b>Determinands</b>   | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | -        | -        | <1       | <1       | -        | -        | -        | -        | -        | <1       | <1       | -        |
| TPH (C10-C28)         | ! mg/kg      | -        | -        | 195      | 322      | -        | -        | -        | -        | -        | 32       | 550      | -        |
| TPH (C28-C40)         | ! mg/kg      | -        | -        | 92       | 276      | -        | -        | -        | -        | -        | <10      | 452      | -        |
| TPH Aromatic C5-C7    | ! mg/kg      | -        | -        | 0.02     | 0.01     | -        | -        | -        | -        | -        | -        | <0.01    | -        |
| TPH Aromatic C7-C8    | ! mg/kg      | -        | -        | <0.01    | <0.01    | -        | -        | -        | -        | -        | -        | <0.01    | -        |
| TPH Aromatic C8-C10   | ! mg/kg      | -        | -        | <0.01    | <0.01    | -        | -        | -        | -        | -        | -        | <0.01    | -        |
| TPH Aromatic C10-C12  | ! mg/kg      | -        | -        | <1       | <1       | -        | -        | -        | -        | -        | -        | <1       | -        |
| TPH Aromatic C12-C16  | ! mg/kg      | -        | -        | <1       | 1        | -        | -        | -        | -        | -        | -        | 2        | -        |
| TPH Aromatic C16-C21  | ! mg/kg      | -        | -        | 2        | 4        | -        | -        | -        | -        | -        | -        | 7        | -        |
| TPH Aromatic C21-C35  | ! mg/kg      | -        | -        | 3        | 8        | -        | -        | -        | -        | -        | -        | 8        | -        |
| TPH Aliphatic C5-C6   | ! mg/kg      | -        | -        | 0.1      | <0.1     | -        | -        | -        | -        | -        | -        | <0.1     | -        |
| TPH Aliphatic C6-C8   | ! mg/kg      | -        | -        | <0.1     | <0.1     | -        | -        | -        | -        | -        | -        | <0.1     | -        |
| TPH Aliphatic C8-C10  | ! mg/kg      | -        | -        | <0.1     | <0.1     | -        | -        | -        | -        | -        | -        | <0.1     | -        |
| TPH Aliphatic C10-C12 | ! mg/kg      | -        | -        | 21       | 20       | -        | -        | -        | -        | -        | -        | 19       | -        |
| TPH Aliphatic C12-C16 | ! mg/kg      | -        | -        | 38       | 46       | -        | -        | -        | -        | -        | -        | 64       | -        |
| TPH Aliphatic C16-C21 | ! mg/kg      | -        | -        | 72       | 173      | -        | -        | -        | -        | -        | -        | 196      | -        |
| TPH Aliphatic C21-C35 | ! mg/kg      | -        | -        | 156      | 359      | -        | -        | -        | -        | -        | -        | 723      | -        |

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|-------------------------------|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                               | Sample id             | TP 64    | TP 64    | TP 65    | TP 66    | TP 67    | TP 67    | TP 68    | TP 69    | TP 69    | TP 70    | TP 71    | TP 72    |
|                               | Depth (m)             | 0.50     | 3.00     | 0.40     | 0.20     | 1.50     | 3.50     | 2.00     | 1.00     | 3.00     | 2.50     | 2.00     | 1.00     |
| <b>Determinands</b>           | <b>Units</b>          |          |          |          |          |          |          |          |          |          |          |          |          |
| Arsenic (total)               | mg/kg As              | 55       | 5        | 53       | 16       | 45       | 4        | 9        | 25       | 50       | 8        | 8        | 16       |
| Boron (water soluble)         | mg/kg B               | 0.5      | 1.2      | 0.9      | 0.8      | 0.5      | 0.4      | 0.6      | 0.5      | 1.1      | 0.6      | 0.6      | 0.6      |
| Cadmium (total)               | mg/kg Cd              | <0.2     | <0.2     | 0.3      | 1.5      | <0.2     | <0.2     | 0.3      | 0.6      | 0.3      | <0.2     | <0.2     | 0.6      |
| Chromium (total)              | mg/kg Cr              | 12       | 15       | 15       | 16       | 15       | 12       | 20       | 14       | 12       | 12       | 12       | 22       |
| Copper (total)                | mg/kg Cu              | 26       | 16       | 112      | 38       | 40       | 9        | 23       | 41       | 93       | 11       | 23       | 67       |
| Lead (total)                  | mg/kg Pb              | 46       | 14       | 54       | 25       | 27       | 9        | 20       | 28       | 148      | 12       | 16       | 203      |
| Mercury (total)               | ! mg/kg Hg            | 1.4      | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 14       | 8        | 30       | 22       | 11       | 19       | 37       | 30       | 65       | 15       | 24       | 18       |
| Selenium (total)              | mg/kg Se              | 1.3      | <0.3     | 1.4      | <0.3     | <0.3     | <0.3     | <0.3     | <0.3     | 0.8      | <0.3     | <0.3     | <0.3     |
| Zinc (total)                  | mg/kg Zn              | 30       | 38       | 104      | 166      | 45       | 61       | 89       | 100      | 127      | 41       | 77       | 373      |
| pH                            | units pH              | 6.0      | 4.3      | 6.7      | 7.9      | 3.8      | 4.5      | 8.2      | 7.3      | 7.6      | 7.4      | 8.1      | 8.6      |
| Magnesium (2:1 water soluble) | mg/l Mg               | 3.1      | -        | 35       | -        | 8.5      | -        | -        | -        | 23       | -        | -        | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | 208      | -        | 296      | -        | 198      | -        | -        | -        | 987      | -        | -        | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 5211     | 412      | 6569     | 1111     | 9780     | 1309     | 2725     | 1935     | 6133     | 799      | 1803     | 2445     |
| Sulphide                      | mg/kg S <sup>2-</sup> | <10      | <10      | <10      | <10      | <10      | <10      | 12       | 16       | <10      | <10      | <10      | 51       |
| Sulphur (total)               | ! mg/kg S             | 4970     | -        | 3426     | -        | 5124     | -        | -        | -        | 1969     | -        | -        | -        |
| Cyanide (total)               | mg/kg CN              | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 170      | 120      | 470      | 570      | <50      | <50      | 210      | 240      | 2150     | 130      | 110      | 5400     |
| Loss on Ignition              | % w/w                 | 9.23     | 4.19     | 24.83    | 15.98    | 20.16    | -        | -        | 19.38    | 12.08    | -        | -        | -        |
| Organic matter content        | % w/w                 | 9.00     | 0.82     | 7.23     | 3.69     | 2.71     | 0.88     | 0.46     | 4.11     | 3.38     | 1.10     | 0.66     | 2.63     |
| Calorific Value               | ! kJ/kg               | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |
| Phenols (total)               | mg/kg                 | -        | -        | -        | <0.5     | -        | -        | -        | -        | <0.5     | -        | -        | <0.5     |
| Asbestos                      | \$                    | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | NAF      |

NAF=Non Asbestos Fibres

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|                      | Lab Number   | 35568-25 | 35568-26 | 35568-27 | 35568-28 | 35568-29 | 35568-30 | 35568-31 | 35568-32 | 35568-33 | 35568-34 | 35568-35 | 35568-36 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      | Sample Id    | TP 64    | TP 64    | TP 65    | TP 66    | TP 67    | TP 67    | TP 68    | TP 69    | TP 69    | TP 70    | TP 71    | TP 72    |
|                      | Depth (m)    | 0.50     | 3.00     | 0.40     | 0.20     | 1.50     | 3.50     | 2.00     | 1.00     | 3.00     | 2.50     | 2.00     | 1.00     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 35.5     |
| Acenaphthylene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 1.3      |
| Acenaphthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 5.9      |
| Fluorene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 6.8      |
| Phenanthrene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 80.6     |
| Anthracene           | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 18.0     |
| Fluoranthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 1.0      |
| Pyrene               | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 27.1     |
| Benzo(a)anthracene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 86.9     |
| Chrysene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 18.3     |
| Benzo(b)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 79.2     |
| Benzo(k)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 49.0     |
| Benzo(a)pyrene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 71.1     |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 12.6     |
| Dibenz(ah)anthracene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 0.4      |
| Benzo(ghi)perylene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 55.7     |
| PAH (total)          | ! mg/kg      | -        | -        | -        | 6.5      | -        | -        | -        | -        | <5       | -        | -        | 550      |

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|                      | Lab Number   | 35568-25 | 35568-26 | 35568-27 | 35568-28 | 35568-29 | 35568-30 | 35568-31 | 35568-32 | 35568-33 | 35568-34 | 35568-35 | 35568-36 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      | Sample id    | TP 64    | TP 64    | TP 65    | TP 66    | TP 67    | TP 67    | TP 68    | TP 69    | TP 69    | TP 70    | TP 71    | TP 72    |
|                      | Depth (m)    | 0.50     | 3.00     | 0.40     | 0.20     | 1.50     | 3.50     | 2.00     | 1.00     | 3.00     | 2.50     | 2.00     | 1.00     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 35.5     |
| Acenaphthylene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 1.3      |
| Acenaphthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 5.9      |
| Fluorene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 6.8      |
| Phenanthrene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 80.6     |
| Anthracene           | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 18.0     |
| Fluoranthene         | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 1.0      |
| Pyrene               | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 27.1     |
| Benzo(a)anthracene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 86.9     |
| Chrysene             | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 18.3     |
| Benzo(b)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 79.2     |
| Benzo(k)fluoranthene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 49.0     |
| Benzo(a)pyrene       | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 71.1     |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 12.6     |
| Dibenz(ah)anthracene | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 0.4      |
| Benzo(ghi)perylene   | ! mg/kg      | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        | 55.7     |
| PAH (total)          | ! mg/kg      | -        | -        | -        | 6.5      | -        | -        | -        | -        | <5       | -        | -        | 550      |

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|-----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                       | Sample id    | TP 64    | TP 64    | TP 65    | TP 66    | TP 67    | TP 67    | TP 68    | TP 69    | TP 69    | TP 70    | TP 71    | TP 72    |
|                       | Depth (m)    | 0.50     | 3.00     | 0.40     | 0.20     | 1.50     | 3.50     | 2.00     | 1.00     | 3.00     | 2.50     | 2.00     | 1.00     |
| <i>Determinands</i>   | <i>Units</i> |          |          |          |          |          |          |          |          |          |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | -        | -        | -        | <1       | -        | -        | -        | -        | <1       | -        | -        | <1       |
| TPH (C10-C28)         | ! mg/kg      | -        | -        | -        | 402      | -        | -        | -        | -        | 121      | -        | -        | 2162     |
| TPH (C28-C40)         | ! mg/kg      | -        | -        | -        | 232      | -        | -        | -        | -        | 198      | -        | -        | 2036     |
| TPH Aromatic C5-C7    | ! mg/kg      | -        | -        | -        | 0.11     | -        | -        | -        | -        | -        | -        | -        | <0.01    |
| TPH Aromatic C7-C8    | ! mg/kg      | -        | -        | -        | 0.09     | -        | -        | -        | -        | -        | -        | -        | <0.01    |
| TPH Aromatic C8-C10   | ! mg/kg      | -        | -        | -        | 0.02     | -        | -        | -        | -        | -        | -        | -        | <0.01    |
| TPH Aromatic C10-C12  | ! mg/kg      | -        | -        | -        | <1       | -        | -        | -        | -        | -        | -        | -        | 42       |
| TPH Aromatic C12-C16  | ! mg/kg      | -        | -        | -        | <1       | -        | -        | -        | -        | -        | -        | -        | 67       |
| TPH Aromatic C16-C21  | ! mg/kg      | -        | -        | -        | 3        | -        | -        | -        | -        | -        | -        | -        | 189      |
| TPH Aromatic C21-C35  | ! mg/kg      | -        | -        | -        | 5        | -        | -        | -        | -        | -        | -        | -        | 456      |
| TPH Aliphatic C5-C6   | ! mg/kg      | -        | -        | -        | 0.1      | -        | -        | -        | -        | -        | -        | -        | <0.1     |
| TPH Aliphatic C6-C8   | ! mg/kg      | -        | -        | -        | 0.1      | -        | -        | -        | -        | -        | -        | -        | <0.1     |
| TPH Aliphatic C8-C10  | ! mg/kg      | -        | -        | -        | <0.1     | -        | -        | -        | -        | -        | -        | -        | <0.1     |
| TPH Aliphatic C10-C12 | ! mg/kg      | -        | -        | -        | 7        | -        | -        | -        | -        | -        | -        | -        | 12       |
| TPH Aliphatic C12-C16 | ! mg/kg      | -        | -        | -        | 29       | -        | -        | -        | -        | -        | -        | -        | 49       |
| TPH Aliphatic C16-C21 | ! mg/kg      | -        | -        | -        | 81       | -        | -        | -        | -        | -        | -        | -        | 689      |
| TPH Aliphatic C21-C35 | ! mg/kg      | -        | -        | -        | 517      | -        | -        | -        | -        | -        | -        | -        | 3448     |



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|-------------------------------|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                               | Sample id             | TP 73    | TP 74    | TP 74    | TP 75    | TP 76    | TP 77    | TP 78    | TP 79    | TP 79    |
|                               | Depth (m)             | 1.20     | 0.20     | 1.00     | 2.00     | 0.50     | 1.00     | 2.60     | 0.50     | 2.20     |
| <b>Determinands</b>           | <b>Units</b>          |          |          |          |          |          |          |          |          |          |
| Arsenic (total)               | mg/kg As              | 255      | 43       | 5        | 26       | 67       | 7        | 22       | 7        | 3        |
| Boron (water soluble)         | mg/kg B               | 2.7      | 0.7      | 0.3      | 0.6      | 1.3      | 0.3      | 0.7      | 0.7      | 0.6      |
| Cadmium (total)               | mg/kg Cd              | 0.5      | 0.4      | <0.2     | 0.4      | 0.5      | 0.3      | <0.2     | 0.9      | <0.2     |
| Chromium (total)              | mg/kg Cr              | 28       | 18       | 11       | 16       | 15       | 33       | 11       | 14       | 12       |
| Copper (total)                | mg/kg Cu              | 161      | 160      | 18       | 54       | 97       | 37       | 41       | 38       | 10       |
| Lead (total)                  | mg/kg Pb              | 107      | 105      | 15       | 34       | 30       | 49       | 58       | 63       | 7        |
| Mercury (total)               | mg/kg Hg              | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     |
| Nickel (total)                | mg/kg Ni              | 71       | 29       | 25       | 32       | 24       | 23       | 16       | 14       | 16       |
| Selenium (total)              | mg/kg Se              | 6.3      | 1.3      | <0.3     | <0.3     | 1.5      | <0.3     | 0.6      | <0.3     | <0.3     |
| Zinc (total)                  | mg/kg Zn              | 123      | 150      | 43       | 103      | 39       | 98       | 99       | 106      | 35       |
| pH                            | units pH              | 7.8      | 8.2      | 5.3      | 8.1      | 7.1      | 8.4      | 8.2      | 8.3      | 6.2      |
| Magnesium (2:1 water soluble) | mg/l Mg               | 20       | -        | -        | 1.5      | 28       | -        | -        | -        | -        |
| Sulphate (2:1 water soluble)  | mg/l SO <sub>4</sub>  | 1760     | -        | -        | 328      | 1135     | -        | -        | -        | -        |
| Sulphate (total)              | mg/kg SO <sub>4</sub> | 26375    | 2272     | 2083     | 15748    | 11492    | 2914     | 4857     | 2544     | 1202     |
| Sulphide                      | mg/kg S <sup>2-</sup> | 65       | 40       | <10      | <10      | <10      | 125      | 133      | 73       | 133      |
| Sulphur (total)               | mg/kg S               | 11310    | -        | -        | 5408     | 12780    | -        | -        | -        | -        |
| Cyanide (total)               | mg/kg CN              | 3.2      | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       |
| TEM                           | mg/kg                 | 720      | 3680     | 120      | 280      | 2630     | 2000     | 1200     | 3570     | 160      |
| Loss on Ignition              | % w/w                 | 13.75    | -        | -        | 17.15    | 32.46    | -        | -        | -        | -        |
| Organic matter content        | % w/w                 | 3.21     | 4.93     | 1.50     | 3.58     | 5.90     | 1.08     | 5.49     | 2.87     | 0.51     |
| Calorific Value               | kJ/kg                 | -        | -        | -        | -        | 6160     | -        | -        | -        | -        |
| Phenols (total)               | mg/kg                 | 2.7      | 2.4      | -        | -        | 2.4      | 2.6      | <0.5     | <0.5     | -        |
| Asbestos                      | \$                    | -        | -        | -        | -        | -        | NAF      | -        | NAF      | -        |

NAF=Non Asbestos Fibres

Contract number: SDA/35568(3)  
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# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                      | Lab Number   | 35568-37 | 35568-38 | 35568-39 | 35568-40 | 35568-41 | 35568-42 | 35568-43 | 35568-44 | 35568-45 |
|----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                      | Sample id    | TP 73    | TP 74    | TP 74    | TP 75    | TP 76    | TP 77    | TP 78    | TP 79    | TP 79    |
|                      | Depth (m)    | 1.20     | 0.20     | 1.00     | 2.00     | 0.50     | 1.00     | 2.60     | 0.50     | 2.20     |
| <b>Determinands</b>  | <b>Units</b> |          |          |          |          |          |          |          |          |          |
| Naphthalene          | ! mg/kg      | -        | 1.5      | -        | -        | -        | 0.1      | -        | 0.6      | -        |
| Acenaphthylene       | ! mg/kg      | -        | 0.5      | -        | -        | -        | 0.3      | -        | 1.5      | -        |
| Acenaphthene         | ! mg/kg      | -        | 0.3      | -        | -        | -        | 0.1      | -        | 0.5      | -        |
| Fluorene             | ! mg/kg      | -        | 1.0      | -        | -        | -        | <0.1     | -        | 1.0      | -        |
| Phenanthrene         | ! mg/kg      | -        | 2.4      | -        | -        | -        | 0.8      | -        | 5.6      | -        |
| Anthracene           | ! mg/kg      | -        | 0.6      | -        | -        | -        | 0.5      | -        | 2.5      | -        |
| Fluoranthene         | ! mg/kg      | -        | 0.1      | -        | -        | -        | 2.7      | -        | <0.1     | -        |
| Pyrene               | ! mg/kg      | -        | 0.9      | -        | -        | -        | 2.8      | -        | 2.1      | -        |
| Benzo(a)anthracene   | ! mg/kg      | -        | 2.3      | -        | -        | -        | 2.4      | -        | 6.6      | -        |
| Chrysene             | ! mg/kg      | -        | 0.2      | -        | -        | -        | 0.7      | -        | 1.7      | -        |
| Benzo(b)fluoranthene | ! mg/kg      | -        | 2.3      | -        | -        | -        | 3.1      | -        | 7.8      | -        |
| Benzo(k)fluoranthene | ! mg/kg      | -        | 1.4      | -        | -        | -        | 1.2      | -        | 3.2      | -        |
| Benzo(a)pyrene       | ! mg/kg      | -        | 0.4      | -        | -        | -        | 2.4      | -        | 6.5      | -        |
| Indeno(123cd)pyrene  | ! mg/kg      | -        | 1.7      | -        | -        | -        | 0.3      | -        | 1.3      | -        |
| Dibenz(ah)anthracene | ! mg/kg      | -        | 0.2      | -        | -        | -        | 0.5      | -        | 1.4      | -        |
| Benzo(ghi)perylene   | ! mg/kg      | -        | 0.3      | -        | -        | -        | 1.9      | -        | 4.5      | -        |
| PAH (total)          | ! mg/kg      | 14       | 16       | -        | -        | 8.2      | 20       | 9.0      | 47       | -        |

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Contract number: SDA/35568(3)  
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# SOILS

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
DH8 6BP

|                       | Lab Number   | 35568-37 | 35568-38 | 35568-39 | 35568-40 | 35568-41 | 35568-42 | 35568-43 | 35568-44 | 35568-45 |
|-----------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                       | Sample id    | TP 73    | TP 74    | TP 74    | TP 75    | TP 76    | TP 77    | TP 78    | TP 79    | TP 79    |
|                       | Depth (m)    | 1.20     | 0.20     | 1.00     | 2.00     | 0.50     | 1.00     | 2.60     | 0.50     | 2.20     |
| <b>Determinands</b>   | <b>Units</b> |          |          |          |          |          |          |          |          |          |
| TPH (C5-C10)          | ! mg/kg      | <1       | <1       | -        | -        | <1       | <1       | <1       | <1       | -        |
| TPH (C10-C28)         | ! mg/kg      | 314      | 1481     | -        | -        | 2508     | 195      | 459      | 1143     | -        |
| TPH (C28-C40)         | ! mg/kg      | 511      | 1791     | -        | -        | 291      | 569      | 477      | 610      | -        |
| TPH Aromatic C5-C7    | ! mg/kg      | 0.01     | 0.02     | -        | -        | 0.01     | <0.01    | <0.01    | <0.01    | -        |
| TPH Aromatic C7-C8    | ! mg/kg      | <0.01    | <0.01    | -        | -        | <0.01    | <0.01    | <0.01    | <0.01    | -        |
| TPH Aromatic C8-C10   | ! mg/kg      | <0.01    | <0.01    | -        | -        | <0.01    | <0.01    | <0.01    | <0.01    | -        |
| TPH Aromatic C10-C12  | ! mg/kg      | <1       | 2        | -        | -        | 1        | <1       | <1       | 2        | -        |
| TPH Aromatic C12-C16  | ! mg/kg      | 2        | 4        | -        | -        | 3        | <1       | 1        | 4        | -        |
| TPH Aromatic C16-C21  | ! mg/kg      | 9        | 8        | -        | -        | 6        | <1       | 5        | 18       | -        |
| TPH Aromatic C21-C35  | ! mg/kg      | 13       | 14       | -        | -        | 3        | <1       | 8        | 41       | -        |
| TPH Aliphatic C5-C6   | ! mg/kg      | <0.1     | <0.1     | -        | -        | <0.1     | <0.1     | <0.1     | <0.1     | -        |
| TPH Aliphatic C6-C8   | ! mg/kg      | <0.1     | <0.1     | -        | -        | <0.1     | <0.1     | <0.1     | <0.1     | -        |
| TPH Aliphatic C8-C10  | ! mg/kg      | <0.1     | <0.1     | -        | -        | <0.1     | <0.1     | <0.1     | <0.1     | -        |
| TPH Aliphatic C10-C12 | ! mg/kg      | 3        | 44       | -        | -        | 14       | <1       | 10       | 4        | -        |
| TPH Aliphatic C12-C16 | ! mg/kg      | 12       | 81       | -        | -        | 98       | 4        | 54       | 21       | -        |
| TPH Aliphatic C16-C21 | ! mg/kg      | 64       | 312      | -        | -        | 1368     | 19       | 169      | 209      | -        |
| TPH Aliphatic C21-C35 | ! mg/kg      | 746      | 2835     | -        | -        | 1319     | 741      | 703      | 1519     | -        |

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# LEACHATES

Scott Doherty Associates  
Derwentside Business Centre  
Consett Business Park  
Consett  
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|                       | Lab Number             | 35568-16L | 35568-36L | 35568-37L | 35568-41L |
|-----------------------|------------------------|-----------|-----------|-----------|-----------|
|                       | Sample id              | TP 58     | TP 72     | TP 73     | TP 76     |
|                       | Depth                  | 2.80      | 1.00      | 1.20      | 0.50      |
| <b>Determinands</b>   | <b>Units</b>           |           |           |           |           |
| Arsenic (total)       | mg/l As                | <0.001    | 0.003     | <0.001    | <0.001    |
| Boron (water soluble) | mg/l B                 | 0.05      | <0.03     | 0.15      | 0.07      |
| Cadmium (total)       | mg/l Cd                | <0.001    | <0.001    | <0.001    | <0.001    |
| Chromium (total)      | mg/l Cr                | <0.003    | <0.003    | <0.003    | <0.003    |
| Copper (total)        | mg/l Cu                | <0.004    | <0.004    | <0.004    | <0.004    |
| Lead (total)          | mg/l Pb                | <0.009    | <0.009    | <0.009    | <0.009    |
| Mercury (total)       | mg/l Hg                | <0.001    | <0.001    | <0.001    | <0.001    |
| Nickel (total)        | mg/l Ni                | 0.008     | <0.003    | <0.003    | <0.003    |
| Selenium (total)      | mg/l Se                | 0.002     | <0.001    | 0.001     | <0.001    |
| Zinc (total)          | mg/l Zn                | 0.076     | <0.020    | <0.020    | <0.020    |
| pH                    | units pH               | 7.4       | 8.9       | 7.6       | 7.2       |
| Sulphate              | mg/l SO <sub>4</sub>   | 199       | 20        | 877       | 385       |
| Sulphide              | ! mg/l S <sup>2-</sup> | <0.1      | <0.1      | <0.1      | <0.1      |
| Cyanide (total)       | mg/l CN                | <0.02     | <0.02     | <0.02     | <0.02     |
| Phenols (total)       | ! mg/l PhOH            | <0.0005   | <0.0005   | <0.0005   | <0.0005   |
| PAH (total)           | ! mg/l                 | <0.0001   | 0.0148    | <0.0001   | <0.0001   |
| TPH (C10-C40)         | ! mg/l                 | 0.04      | 0.72      | 0.04      | 1.13      |

## ANALYTICAL TEST REPORT

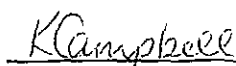
**Contract no:** SDA/36205  
**Contract name:** North Gawber, Barnsley  
**Client reference:** -  
**Clients name:** Scott Doherty Associates  
**Clients address:** Consett Business Centre  
Consett Business Park  
Consett  
DH8 6BP

**Date received:** 30 January 2008  
**Date started:** 30 January 2008  
**Date of issue:** 06 February 2008

**Notes:** Opinions and interpretations expressed herein are outside the UKAS accreditation scope.  
Unless otherwise stated, Chemtech Environmental Ltd were not responsible for sampling.  
Methods, procedures and performance data are available on request.  
Results reported herein relate only to the material supplied to the laboratory.  
All results are reported on a dry basis.  
This report shall not be reproduced except in full, without prior written approval.  
Samples will be disposed of 8 weeks from initial receipt unless otherwise instructed.

**Key:** U UKAS accredited test  
M MCERTS & UKAS accredited test  
\$ Test carried out by an approved subcontractor  
NAF Non asbestos fibres

**Approved by:**



Karan Campbell  
Director

John Campbell  
Director

## SAMPLE DESCRIPTIONS

### MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation.

They are not intended as full geological descriptions.

MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample.

Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

| Lab number | Sample id | Depth (m) | Description | Moisture (%) |
|------------|-----------|-----------|-------------|--------------|
| 36205-1    | TP 6      | 0.70      | Sand        | 11.9         |
| 36205-2    | TP 53     | 1.00      | Clay        | 16.3         |

# Chemtech Environmental Limited

## SOILS

|                        |        |       |         |         |
|------------------------|--------|-------|---------|---------|
| Lab number             |        |       | 36205-1 | 36205-2 |
| Sample id              |        |       | TP 6    | TP 53   |
| Depth (m)              |        |       | 0.70    | 1.00    |
| Test                   | Method | Units |         |         |
| Subcontracted analysis |        |       |         |         |
| Asbestos               | \$     | -     | NAF     | NAF     |

# Chemtech Environmental Limited

## METHOD DETAILS

| METHOD | SOILS    | METHOD SUMMARY                          | STATUS | LOD | UNITS |
|--------|----------|-----------------------------------------|--------|-----|-------|
| \$     | Asbestos | MDHS 77, Microscopy (UKAS for fibre id) |        | -   | -     |



**APPENDIX G**  
**Summary Tables of Chemical Test Results**

**Made Ground (Area 1)**

| Contaminant             | Screening Value       | Units | Minimum Value   | Maximum Value   | No. Exceeding Screen |
|-------------------------|-----------------------|-------|-----------------|-----------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 7               | 28              | 3                    |
| Cadmium                 | 1 (SGV)               | mg/kg | <0.2            | 0.3             | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 12              | 25              | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 22              | 55              | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5            | <0.5            | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3            | <0.3            | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 19              | 50              | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 16              | 34              | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 49              | 80              | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.5             | 1.6             | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 35 (one sample) | 35 (one sample) | 0                    |

**Table 1: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value     | Maximum Value     | No. Exceeding Screen |
|------------------------|-------------------------|-------|-------------------|-------------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 362               | 6544              | 0                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | 3957 (one sample) | 3957 (one sample) | 0                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 1750 (one sample) | 1750 (one sample) | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | <10               | 43                | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2                | <2                | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | 7.85              | 40.43             | 1                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | 5235 (One Sample) | 5235 (One Sample) | 1                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 3.5               | 7.7               | 1                    |

**Table 2: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value     | Maximum Value     | No. Exceeding Screen |
|---------------|----------------------|-------|-------------------|-------------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | Mg/kg | 150               | 760               | 1                    |
| Total Phenols | 307.3 (SGV)          | Mg/kg | <0.5 (one sample) | <0.5 (one sample) | 0                    |
| Total PAH     | 15 (GSSV)            | Mg/kg | 25 (one sample)   | 25 (one sample)   | 1                    |
| TPH C5-C10    | 4.63 (GSSV)          | Mg/kg | <1 (one sample)   | <1 (one sample)   | 0                    |
| TPH C10-C28   | 132.59 (GSSV)        | Mg/kg | 1043 (one sample) | 1043 (one sample) | 1                    |
| TPH C28-C40   | 1801.7 (GSSV)        | Mg/kg | 397 (one sample)  | 397 (one sample)  | 0                    |

**Table 3: Summary of Soil Contamination Levels (Organic Compounds)**

| Contaminant          | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|----------------------|-----------------|-------|---------------|---------------|----------------------|
| Naphthalene          | 16.9 (GSSV)     | mg/kg | 1.7           | 1.7           | 0                    |
| Acenaphthylene       | 659.2 (GSSV)    | mg/kg | 1.2           | 1.2           | 0                    |
| Acenaphthene         | 1860.4 (GSSV)   | mg/kg | 0.6           | 0.6           | 0                    |
| Fluorene             | 1774.4 (GSSV)   | mg/kg | 2.2           | 2.2           | 0                    |
| Phenanthrene         | 1447.2 (GSSV)   | mg/kg | 2.2           | 2.2           | 0                    |
| Anthracene           | 15108.9 (GSSV)  | mg/kg | 11.0          | 11.0          | 0                    |
| Fluoranthene         | 2468.1 (GSSV)   | mg/kg | 0.5           | 0.5           | 0                    |
| Pyrene               | 1817 (GSSV)     | mg/kg | 2.1           | 2.1           | 0                    |
| Benzo(a)anthracene   | 12.1 (GSSV)     | mg/kg | 0.9           | 0.9           | 0                    |
| Chrysene             | 27.6 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Benzo(b)fluoranthene | 9.6 (GSSV)      | mg/kg | 0.7           | 0.7           | 0                    |
| Benzo(k)fluoranthene | 42.3 (GSSV)     | mg/kg | 0.2           | 0.2           | 0                    |
| Benzo(a)pyrene       | 1.3 (GSSV)      | mg/kg | 0.7           | 0.7           | 0                    |
| Indeno(123cd)pyrene  | 15.7 (GSSV)     | mg/kg | 0.6           | 0.6           | 0                    |
| Dibenz(ah)anthracene | 0.67 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Benzo(ghi)perylene   | 1906.5 (GSSV)   | mg/kg | 0.7           | 0.7           | 0                    |

**Table 3A: Summary of Soil Contamination Levels (Speciated PAH's) 5% SOM**

| Contaminant       | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------|-----------------|-------|---------------|---------------|----------------------|
| Aromatic C5-C7    | 0.1 (GSSV)      | mg/kg | 0.03          | 0.03          | 0                    |
| Aromatic C7-C8    | 14.3 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C8-C10   | 26.0 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C10-C12  | 122.8 (GSSV)    | mg/kg | 2             | 2             | 0                    |
| Aromatic C12-C16  | 452.9 (GSSV)    | mg/kg | 5             | 5             | 0                    |
| Aromatic C16-C21  | 1058.2 (GSSV)   | mg/kg | 25            | 25            | 0                    |
| Aromatic C21-C35  | 1801.7 (GSSV)   | mg/kg | 10            | 10            | 0                    |
| Aliphatic C5-C6   | 23.3 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C6-C8   | 65.4 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C8-C10  | 16.5 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C10-C12 | 85.2 (GSSV)     | mg/kg | 88            | 88            | 1                    |
| Aliphatic C12-C16 | 373.8 (GSSV)    | mg/kg | 165           | 165           | 0                    |
| Aliphatic C16-C21 | 28937.7 (GSSV)  | mg/kg | 485           | 485           | 0                    |
| Aliphatic C21-C35 | 28937.7 (GSSV)  | mg/kg | 702           | 702           | 0                    |

**Table 3B: Summary of Soil Contamination Levels (Speciated TPH's) 5% SOM**

**Made Ground (Area 2)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 11            | 52            | 12                   |
| Cadmium                 | 1 (SGV)               | mg/kg | <0.2          | 0.8           | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 7             | 41            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 21            | 90            | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | <0.5          | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | 1.3           | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 27            | 81            | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 12            | 34            | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 24            | 129           | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.3           | 0.9           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 18            | 51            | 0                    |

**Table 4: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 1021          | 45992         | 2                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | 2750          | 17073         | 3                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 933           | 3303          | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | <10           | 43            | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | <2            | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | 5.66          | 52.59         | 5                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | 1901          | 7277          | 4                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 3.5           | 8.3           | 5                    |

**Table 5: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | mg/kg | 50            | 4170          | 6                    |
| Total Phenols | 307.3 (SGV)          | mg/kg | <0.5          | <0.5          | 0                    |
| Total PAH     | 15 (GSSV)            | mg/kg | 5.3           | 18            | 2                    |
| TPH C5-C10    | 4.63 (GSSV)          | mg/kg | <1            | <1            | 0                    |
| TPH C10-C28   | 132.59 (GSSV)        | mg/kg | <10           | 883           | 5                    |
| TPH C28-C40   | 1801.7 (GSSV)        | mg/kg | <10           | 767           | 0                    |

**Table 6: Summary of Soil Contamination Levels (Organic Compounds)**

| Contaminant          | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|----------------------|-----------------|-------|---------------|---------------|----------------------|
| Naphthalene          | 16.9 (GSSV)     | mg/kg | 0.6           | 0.9           | 0                    |
| Acenaphthylene       | 659.2 (GSSV)    | mg/kg | 0.1           | 0.2           | 0                    |
| Acenaphthene         | 1860.4 (GSSV)   | mg/kg | 0.2           | 0.2           | 0                    |
| Fluorene             | 1774.4 (GSSV)   | mg/kg | 0.2           | 0.5           | 0                    |
| Phenanthrene         | 1447.2 (GSSV)   | mg/kg | 1.8           | 1.8           | 0                    |
| Anthracene           | 15108.9 (GSSV)  | mg/kg | 0.8           | 0.8           | 0                    |
| Fluoranthene         | 2468.1 (GSSV)   | mg/kg | 2.8           | 3.0           | 0                    |
| Pyrene               | 1817 (GSSV)     | mg/kg | 3.3           | 3.4           | 0                    |
| Benzo(a)anthracene   | 12.1 (GSSV)     | mg/kg | 1.6           | 1.7           | 0                    |
| Chrysene             | 27.6 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Benzo(b)fluoranthene | 9.6 (GSSV)      | mg/kg | 2.1           | 2.2           | 0                    |
| Benzo(k)fluoranthene | 42.3 (GSSV)     | mg/kg | 0.6           | 1.4           | 0                    |
| Benzo(a)pyrene       | 1.3 (GSSV)      | mg/kg | 1.5           | 1.9           | 2                    |
| Indeno(123cd)pyrene  | 15.7 (GSSV)     | mg/kg | 0.1           | 0.2           | 0                    |
| Dibenz(ah)anthracene | 0.67 (GSSV)     | mg/kg | <0.1          | 0.1           | 0                    |
| Benzo(ghi)perylene   | 1906.5 (GSSV)   | mg/kg | <0.1          | 0.3           | 0                    |

**Table 6A: Summary of Soil Contamination Levels (Speciated PAH's) 5% SOM**

| Contaminant       | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------|-----------------|-------|---------------|---------------|----------------------|
| Aromatic C5-C7    | 0.1 (GSSV)      | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C7-C8    | 14.3 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C8-C10   | 26.0 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C10-C12  | 122.8 (GSSV)    | mg/kg | <1            | 1             | 0                    |
| Aromatic C12-C16  | 452.9 (GSSV)    | mg/kg | <1            | 1             | 0                    |
| Aromatic C16-C21  | 1058.2 (GSSV)   | mg/kg | 3             | 18            | 0                    |
| Aromatic C21-C35  | 1801.7 (GSSV)   | mg/kg | 4             | 11            | 0                    |
| Aliphatic C5-C6   | 23.3 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C6-C8   | 65.4 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C8-C10  | 16.5 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C10-C12 | 85.2 (GSSV)     | mg/kg | 34            | 43            | 0                    |
| Aliphatic C12-C16 | 373.8 (GSSV)    | mg/kg | 61            | 89            | 0                    |
| Aliphatic C16-C21 | 28937.7 (GSSV)  | mg/kg | 165           | 351           | 0                    |
| Aliphatic C21-C35 | 28937.7 (GSSV)  | mg/kg | 386           | 1167          | 0                    |

**Table 6B: Summary of Soil Contamination Levels (Speciated TPH's) 5% SOM**

**Made Ground (Area 3)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | Mg/kg | 10            | 195           | 12                   |
| Cadmium                 | 1 (SGV)               | Mg/kg | <0.2          | 0.6           | 0                    |
| Chromium                | 130 (SGV)             | Mg/kg | 6             | 33            | 0                    |
| Lead                    | 450 (SGV)             | Mg/kg | 8             | 50            | 0                    |
| Mercury                 | 8 (SGV)               | Mg/kg | <0.5          | <0.5          | 0                    |
| Selenium                | 35 (SGV)              | Mg/kg | <0.3          | 1.6           | 0                    |
| Copper                  | 130 (GSSV)            | Mg/kg | 17            | 78            | 0                    |
| Nickel                  | 50 (SGV)              | Mg/kg | 12            | 56            | 1                    |
| Zinc                    | 580 (GSSV)            | Mg/kg | 18            | 99            | 0                    |
| Boron                   | 1300 (GSSV)           | Mg/kg | <0.3          | 1.8           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 5.8           | 221           | 0                    |

**Table 7: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | Mg/kg | 1227          | 31669         | 7                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | Mg/kg | 2231          | 13050         | 7                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 52            | 25406         | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | Mg/kg | <10           | 230           | 0                    |
| Cyanide                | 66 (GSSV)               | Mg/kg | <2            | 7.4           | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | 0.00          | 46.58         | 5                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | 5142          | 11488         | 5                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 2.7           | 7.0           | 11                   |

**Table 8: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | mg/kg | <60           | 400           | 0                    |
| Total Phenols | 307.3 (SGV)          | mg/kg | -             | -             | -                    |
| Total PAH     | 16.96 (GSSV)         | mg/kg | -             | -             | -                    |
| TPH C5-C10    | 4.63 (GSSV)          | mg/kg | -             | -             | -                    |
| TPH C10-C28   | 132.59 (GSSV)        | mg/kg | -             | -             | -                    |
| TPH C28-C40   | 1801.7 (GSSV)        | mg/kg | -             | -             | -                    |

**Table 9: Summary of Soil Contamination Levels (Organic Compounds)**

**Made Ground (Area 4)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | Mg/kg | <1            | 132           | 13                   |
| Cadmium                 | 1 (SGV)               | Mg/kg | <0.2          | 1.0           | 0                    |
| Chromium                | 130 (SGV)             | Mg/kg | 2             | 49            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 11            | 93            | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | <0.5          | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | 1.9           | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 9             | 36            | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 7             | 34            | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 23            | 186           | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.2           | 2.0           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 16            | 321           | 0                    |

**Table 10: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 519           | 31948         | 6                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | 3217          | 8671          | 7                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 107           | 3192          | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | <10           | 93            | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | 4.6           | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | 3.51          | 65.75         | 2                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | 7875          | 13389         | 2                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 3.4           | 8.4           | 8                    |

**Table 11: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | mg/kg | <50           | 5860          | 2                    |
| Total Phenols | 307.3 (SGV)          | mg/kg | <0.5          | <0.5          | 0                    |
| Total PAH     | 15 (GSSV)            | mg/kg | 25            | 42            | 2                    |
| TPH C5-C10    | 4.63 (GSSV)          | mg/kg | <1            | <1            | 0                    |
| TPH C10-C28   | 132.59 (GSSV)        | mg/kg | 410           | 831           | 2                    |
| TPH C28-C40   | 1801.7 (GSSV)        | mg/kg | 492           | 1164          | 0                    |

**Table 12: Summary of Soil Contamination Levels (Organic Compounds)**

| Contaminant          | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|----------------------|-----------------|-------|---------------|---------------|----------------------|
| Naphthalene          | 16.9 (GSSV)     | mg/kg | 0.4           | 0.8           | 0                    |
| Acenaphthylene       | 659.2 (GSSV)    | mg/kg | 0.2           | 0.9           | 0                    |
| Acenaphthene         | 1860.4 (GSSV)   | mg/kg | 0.1           | 0.3           | 0                    |
| Fluorene             | 1774.4 (GSSV)   | mg/kg | 0.1           | 0.3           | 0                    |
| Phenanthrene         | 1447.2 (GSSV)   | mg/kg | 1.7           | 2.0           | 0                    |
| Anthracene           | 15108.9 (GSSV)  | mg/kg | 0.6           | 1.6           | 0                    |
| Fluoranthene         | 2468.1 (GSSV)   | mg/kg | 3.3           | 5.0           | 0                    |
| Pyrene               | 1817 (GSSV)     | mg/kg | 3.4           | 4.8           | 0                    |
| Benzo(a)anthracene   | 12.1 (GSSV)     | mg/kg | 1.8           | 3.8           | 0                    |
| Chrysene             | 27.6 (GSSV)     | mg/kg | 1.2           | 1.8           | 0                    |
| Benzo(b)fluoranthene | 9.6 (GSSV)      | mg/kg | 3.1           | 5.3           | 0                    |
| Benzo(k)fluoranthene | 42.3 (GSSV)     | mg/kg | 1.5           | 2.7           | 0                    |
| Benzo(a)pyrene       | 1.3 (GSSV)      | mg/kg | 2.7           | 5.0           | 2                    |
| Indeno(123cd)pyrene  | 15.7 (GSSV)     | mg/kg | 2.3           | 3.9           | 0                    |
| Dibenz(ah)anthracene | 0.67 (GSSV)     | mg/kg | 0.1           | 0.7           | 1                    |
| Benzo(ghi)perylene   | 1906.5 (GSSV)   | mg/kg | 1.8           | 3.6           | 0                    |

**Table 12A: Summary of Soil Contamination Levels (Speciated PAH's) 5% SOM**

| Contaminant       | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------|-----------------|-------|---------------|---------------|----------------------|
| Aromatic C5-C7    | 0.1 (GSSV)      | mg/kg | <0.01         | 0.01          | 0                    |
| Aromatic C7-C8    | 14.3 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C8-C10   | 26.0 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C10-C12  | 122.8 (GSSV)    | mg/kg | <1            | 2             | 0                    |
| Aromatic C12-C16  | 452.9 (GSSV)    | mg/kg | <1            | 4             | 0                    |
| Aromatic C16-C21  | 1058.2 (GSSV)   | mg/kg | 11            | 19            | 0                    |
| Aromatic C21-C35  | 1801.7 (GSSV)   | mg/kg | 18            | 37            | 0                    |
| Aliphatic C5-C6   | 23.3 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C6-C8   | 65.4 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C8-C10  | 16.5 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C10-C12 | 85.2 (GSSV)     | mg/kg | 16            | 20            | 0                    |
| Aliphatic C12-C16 | 373.8 (GSSV)    | mg/kg | 37            | 53            | 0                    |
| Aliphatic C16-C21 | 28937.7 (GSSV)  | mg/kg | 75            | 154           | 0                    |
| Aliphatic C21-C35 | 28937.7 (GSSV)  | mg/kg | 774           | 1768          | 0                    |

**Table 12B: Summary of Soil Contamination Levels (Speciated TPH's) 5% SOM**



**Made Ground (Area 5)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 3             | 255           | 26                   |
| Cadmium                 | 2 (SGV)               | mg/kg | <0.2          | 1.5           | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 5             | 39            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 7             | 203           | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | 1.4           | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | 6.3           | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 8             | 328           | 4                    |
| Nickel                  | 50 (SGV)              | mg/kg | 3             | 76            | 3                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 6             | 1706          | 1                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.3           | 2.7           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 1.5           | 87            | 0                    |

**Table 13: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 412           | 66589         | 12                   |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | 1969          | 23120         | 16                   |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 30            | 2229          | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | <10           | 242           | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | 8.6           | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | 0.00          | 32.46         | 2                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | 6160          | 7411          | 2                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 3.5           | 11.1          | 6                    |

**Table 14: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | mg/kg | <50           | 5400          | 14                   |
| Total Phenols | 307.3 (SGV)          | mg/kg | <0.5          | 2.7           | 0                    |
| Total PAH     | 15 (GSSV)            | mg/kg | 3.1           | 550           | 4                    |
| TPH C5-C10    | 4.63 (GSSV)          | mg/kg | <1            | <1            | 0                    |
| TPH C10-C28   | 132.59 (GSSV)        | mg/kg | 32            | 2508          | 12                   |
| TPH C28-C40   | 1801.7 (GSSV)        | mg/kg | <10           | 2036          | 1                    |

**Table 15: Summary of Soil Contamination Levels (Organic Compounds)**

| Contaminant          | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|----------------------|-----------------|-------|---------------|---------------|----------------------|
| Naphthalene          | 16.9 (GSSV)     | mg/kg | 0.1           | 35.5          | 1                    |
| Acenaphthylene       | 659.2 (GSSV)    | mg/kg | 0.3           | 1.5           | 0                    |
| Acenaphthene         | 1860.4 (GSSV)   | mg/kg | 0.1           | 5.9           | 0                    |
| Fluorene             | 1774.4 (GSSV)   | mg/kg | <0.1          | 6.8           | 0                    |
| Phenanthrene         | 1447.2 (GSSV)   | mg/kg | 0.8           | 80.6          | 0                    |
| Anthracene           | 15108.9 (GSSV)  | mg/kg | 0.5           | 18.0          | 0                    |
| Fluoranthene         | 2468.1 (GSSV)   | mg/kg | <0.1          | 2.7           | 0                    |
| Pyrene               | 1817 (GSSV)     | mg/kg | 0.9           | 27.1          | 0                    |
| Benzo(a)anthracene   | 12.1 (GSSV)     | mg/kg | 2.3           | 86.9          | 1                    |
| Chrysene             | 27.6 (GSSV)     | mg/kg | 0.2           | 18.3          | 0                    |
| Benzo(b)fluoranthene | 9.6 (GSSV)      | mg/kg | 2.3           | 79.2          | 1                    |
| Benzo(k)fluoranthene | 42.3 (GSSV)     | mg/kg | 1.2           | 49.0          | 1                    |
| Benzo(a)pyrene       | 1.3 (GSSV)      | mg/kg | 0.4           | 71.1          | 3                    |
| Indeno(123cd)pyrene  | 15.7 (GSSV)     | mg/kg | 0.3           | 12.6          | 0                    |
| Dibenz(ah)anthracene | 0.67 (GSSV)     | mg/kg | 0.2           | 1.4           | 1                    |
| Benzo(ghi)perylene   | 1906.5 (GSSV)   | mg/kg | 0.3           | 55.7          | 0                    |

**Table 15A: Summary of Soil Contamination Levels (Speciated PAH's) 5% SOM**

| Contaminant       | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------|-----------------|-------|---------------|---------------|----------------------|
| Aromatic C5-C7    | 0.1 (GSSV)      | mg/kg | <0.01         | 0.11          | 1                    |
| Aromatic C7-C8    | 14.3 (GSSV)     | mg/kg | <0.01         | 0.09          | 0                    |
| Aromatic C8-C10   | 26.0 (GSSV)     | mg/kg | <0.01         | 0.02          | 0                    |
| Aromatic C10-C12  | 122.8 (GSSV)    | mg/kg | <1            | 42            | 0                    |
| Aromatic C12-C16  | 452.9 (GSSV)    | mg/kg | <1            | 67            | 0                    |
| Aromatic C16-C21  | 1058.2 (GSSV)   | mg/kg | <1            | 189           | 0                    |
| Aromatic C21-C35  | 1801.7 (GSSV)   | mg/kg | <1            | 456           | 0                    |
| Aliphatic C5-C6   | 23.3 (GSSV)     | mg/kg | <0.1          | 0.1           | 0                    |
| Aliphatic C6-C8   | 65.4 (GSSV)     | mg/kg | <0.1          | 0.1           | 0                    |
| Aliphatic C8-C10  | 16.5 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C10-C12 | 85.2 (GSSV)     | mg/kg | <1            | 97            | 1                    |
| Aliphatic C12-C16 | 373.8 (GSSV)    | mg/kg | 4             | 202           | 0                    |
| Aliphatic C16-C21 | 28937.7 (GSSV)  | mg/kg | 19            | 1368          | 0                    |
| Aliphatic C21-C35 | 28937.7 (GSSV)  | mg/kg | 156           | 3448          | 0                    |

**Table 15B: Summary of Soil Contamination Levels (Speciated TPH's) 5% SOM**

**Glacial Till (Area 1)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 9             | 9             | 0                    |
| Cadmium                 | 1 (SGV)               | mg/kg | <0.2          | <0.2          | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 23            | 23            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 13            | 13            | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | <0.5          | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | <0.3          | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 22            | 22            | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 31            | 31            | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 79            | 79            | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.6           | 0.6           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | -             | -             | -                    |

**Table 16: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 230           | 230           | 0                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | -             | -             | -                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | -             | -             | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | 10            | 10            | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | <2            | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | -             | -             | -                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | -             | -             | -                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 6.7           | 6.7           | 0                    |

**Table 17: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | Mg/kg | 140           | 140           | 0                    |
| Total Phenols | 307.3 (SGV)          | Mg/kg | -             | -             | -                    |
| Total PAH     | 15 (GSSV)            | Mg/kg | -             | -             | -                    |
| TPH C5-C10    | 4.63 (GSSV)          | Mg/kg | -             | -             | -                    |
| TPH C10-C28   | 132.59 (GSSV)        | Mg/kg | -             | -             | -                    |
| TPH C28-C40   | 1801.7 (GSSV)        | Mg/kg | -             | -             | -                    |

**Table 18: Summary of Soil Contamination Levels (Organic Compounds)**

**Glacial Till (Area 2)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 4             | 10            | 0                    |
| Cadmium                 | 2 (SGV)               | mg/kg | <0.2          | <0.2          | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 17            | 22            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 10            | 45            | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | <0.5          | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | 0.7           | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 18            | 24            | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 24            | 25            | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 42            | 72            | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.4           | 1.5           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | -             | -             | -                    |

**Table 19: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 346           | 4009          | 0                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | -             | -             | -                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | -             | -             | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | 10            | 35            | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | <2            | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | -             | -             | -                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | -             | -             | -                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 6.0           | 8.0           | 0                    |

**Table 20: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | Mg/kg | 180           | 2150          | 1                    |
| Total Phenols | 307.3 (SGV)          | Mg/kg | <0.5          | <0.5          | 0                    |
| Total PAH     | 15 (GSSV)            | Mg/kg | <5            | <5            | 0                    |
| TPH C5-C10    | 1.08 (GSSV)          | Mg/kg | <1            | <1            | -                    |
| TPH C10-C28   | 27.36 (GSSV)         | Mg/kg | 963           | 963           | 1                    |
| TPH C28-C40   | 1206.6 (GSSV)        | Mg/kg | 1694          | 1694          | 1                    |

**Table 21: Summary of Soil Contamination Levels (Organic Compounds) 1%**

**SOM**

| Contaminant       | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------|-----------------|-------|---------------|---------------|----------------------|
| Aromatic C5-C7    | 0.03 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C7-C8    | 3.1 (GSSV)      | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C8-C10   | 5.3 (GSSV)      | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C10-C12  | 25.3 (GSSV)     | mg/kg | <1            | <1            | 0                    |
| Aromatic C12-C16  | 100.5 (GSSV)    | mg/kg | <1            | <1            | 0                    |
| Aromatic C16-C21  | 332.2 (GSSV)    | mg/kg | <1            | <1            | 0                    |
| Aromatic C21-C35  | 1206.6 (GSSV)   | mg/kg | 3             | 3             | 0                    |
| Aliphatic C5-C6   | 8.8 (GSSV)      | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C6-C8   | 17.2 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C8-C10  | 3.5 (GSSV)      | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C10-C12 | 17.4 (GSSV)     | mg/kg | 9             | 9             | 0                    |
| Aliphatic C12-C16 | 78.5 (GSSV)     | mg/kg | 26            | 26            | 0                    |
| Aliphatic C16-C21 | 7008.0 (GSSV)   | mg/kg | 106           | 106           | 0                    |
| Aliphatic C21-C35 | 7008.0 (GSSV)   | mg/kg | 2516          | 2516          | 0                    |

**Table 21A: Summary of Soil Contamination Levels (Speciated TPH's) 1% SOM**

**Glacial Till (Area 3)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 6             | 43            | 2                    |
| Cadmium                 | 1 (SGV)               | mg/kg | 0.2           | 0.7           | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 19            | 40            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 14            | 161           | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | <0.5          | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | 1.2           | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 11            | 66            | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 10            | 30            | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 41            | 198           | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.6           | 1.5           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 103           | 104           | 0                    |

**Table 22: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 1399          | 9961          | 0                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | 2448          | 3239          | 0                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 15            | 38            | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | <10           | 81            | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | <2            | 0                    |
| Loss on ignition       | 25 (no SGV or GSSV)     | % w/w | -             | -             | -                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | -             | -             | -                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 3.6           | 7.9           | 1                    |

**Table 23: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | mg/kg | <50           | 840           | 1                    |
| Total Phenols | 343.3 (SGV)          | mg/kg | <0.5          | <0.5          | 0                    |
| Total PAH     | 15 (GSSV)            | mg/kg | 50            | 50            | 1                    |
| TPH C5-C10    | 4.63 (GSSV)          | mg/kg | <1            | <1            | -                    |
| TPH C10-C28   | 132.59 (GSSV)        | mg/kg | 553           | 553           | 1                    |
| TPH C28-C40   | 1801.7 (GSSV)        | mg/kg | 284           | 284           | 0                    |

**Table 24: Summary of Soil Contamination Levels (Organic Compounds) 5%**

**SOM**

| Contaminant          | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|----------------------|-----------------|-------|---------------|---------------|----------------------|
| Naphthalene          | 16.9 (GSSV)     | mg/kg | 0.3           | 0.3           | 0                    |
| Acenaphthylene       | 659.2 (GSSV)    | mg/kg | 1.0           | 1.0           | 0                    |
| Acenaphthene         | 1860.4 (GSSV)   | mg/kg | 0.1           | 0.1           | 0                    |
| Fluorene             | 1774.4 (GSSV)   | mg/kg | 0.3           | 0.3           | 0                    |
| Phenanthrene         | 1447.2 (GSSV)   | mg/kg | 7.6           | 7.6           | 0                    |
| Anthracene           | 15108.9 (GSSV)  | mg/kg | 2.9           | 2.9           | 0                    |
| Fluoranthene         | 2468.1 (GSSV)   | mg/kg | 9.9           | 9.9           | 0                    |
| Pyrene               | 1817 (GSSV)     | mg/kg | 7.9           | 7.9           | 0                    |
| Benzo(a)anthracene   | 12.1 (GSSV)     | mg/kg | 5.1           | 5.1           | 0                    |
| Chrysene             | 27.6 (GSSV)     | mg/kg | 1.0           | 1.0           | 0                    |
| Benzo(b)fluoranthene | 9.6 (GSSV)      | mg/kg | 4.1           | 4.1           | 0                    |
| Benzo(k)fluoranthene | 42.3 (GSSV)     | mg/kg | 2.7           | 2.7           | 0                    |
| Benzo(a)pyrene       | 1.3 (GSSV)      | mg/kg | 4.0           | 4.0           | 1                    |
| Indeno(123cd)pyrene  | 15.7 (GSSV)     | mg/kg | 2.2           | 2.2           | 0                    |
| Dibenz(ah)anthracene | 0.67 (GSSV)     | mg/kg | 0.5           | 0.5           | 0                    |
| Benzo(ghi)perylene   | 1906.5 (GSSV)   | mg/kg | <0.1          | <0.1          | 0                    |

**Table 24A: Summary of Soil Contamination Levels (Speciated PAH's) 5% SOM**

| Contaminant       | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------|-----------------|-------|---------------|---------------|----------------------|
| Aromatic C5-C7    | 0.1 (GSSV)      | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C7-C8    | 14.3 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C8-C10   | 26.0 (GSSV)     | mg/kg | <0.01         | <0.01         | 0                    |
| Aromatic C10-C12  | 122.8 (GSSV)    | mg/kg | <1            | <1            | 0                    |
| Aromatic C12-C16  | 452.9 (GSSV)    | mg/kg | 5             | 5             | 0                    |
| Aromatic C16-C21  | 1058.2 (GSSV)   | mg/kg | 41            | 41            | 0                    |
| Aromatic C21-C35  | 1801.7 (GSSV)   | mg/kg | 27            | 27            | 0                    |
| Aliphatic C5-C6   | 23.3 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C6-C8   | 65.4 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C8-C10  | 16.5 (GSSV)     | mg/kg | <0.1          | <0.1          | 0                    |
| Aliphatic C10-C12 | 85.2 (GSSV)     | mg/kg | 33            | 33            | 0                    |
| Aliphatic C12-C16 | 373.8 (GSSV)    | mg/kg | 71            | 71            | 0                    |
| Aliphatic C16-C21 | 28937.7 (GSSV)  | mg/kg | 232           | 232           | 0                    |
| Aliphatic C21-C35 | 28937.7 (GSSV)  | mg/kg | 501           | 501           | 0                    |

**Table 24B: Summary of Soil Contamination Levels (Speciated TPH's) 5% SOM**

**Glacial Till (Area 4)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 1             | 6             | 0                    |
| Cadmium                 | 2 (SGV)               | mg/kg | <0.2          | 0.6           | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 17            | 21            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 8             | 20            | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | <0.5          | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | 0.9           | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 9             | 12            | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 9             | 22            | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 40            | 56            | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.3           | 0.7           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 34            | 34            | 0                    |

**Table 25: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 453           | 7219          | 0                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | 584           | 584           | 0                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 455           | 455           | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | <10           | 105           | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | <2            | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | -             | -             | -                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | -             | -             | -                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 6.5           | 7.9           | 0                    |

**Table 26: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | mg/kg | 70            | 200           | 0                    |
| Total Phenols | 307.3 (SGV)          | mg/kg | -             | -             | -                    |
| Total PAH     | 15 (GSSV)            | mg/kg | -             | -             | -                    |
| TPH C5-C10    | 1.08 (GSSV)          | mg/kg | -             | -             | -                    |
| TPH C10-C28   | 27.36 (GSSV)         | mg/kg | -             | -             | -                    |
| TPH C28-C40   | 1206.6 (GSSV)        | mg/kg | -             | -             | -                    |

**Table 27: Summary of Soil Contamination Levels (Organic Compounds) 1% SOM**



**Glacial Till (Area 5)**

| Contaminant             | Screening Value       | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------------------|-----------------------|-------|---------------|---------------|----------------------|
| Arsenic                 | 20 (SGV)              | mg/kg | 3             | 8             | 0                    |
| Cadmium                 | 1 (SGV)               | mg/kg | <0.2          | <0.2          | 0                    |
| Chromium                | 130 (SGV)             | mg/kg | 11            | 13            | 0                    |
| Lead                    | 450 (SGV)             | mg/kg | 7             | 15            | 0                    |
| Mercury                 | 8 (SGV)               | mg/kg | <0.5          | 0.7           | 0                    |
| Selenium                | 35 (SGV)              | mg/kg | <0.3          | <0.3          | 0                    |
| Copper                  | 130 (GSSV)            | mg/kg | 8             | 18            | 0                    |
| Nickel                  | 50 (SGV)              | mg/kg | 7             | 25            | 0                    |
| Zinc                    | 580 (GSSV)            | mg/kg | 27            | 61            | 0                    |
| Boron                   | 1300 (GSSV)           | mg/kg | 0.3           | 0.8           | 0                    |
| Water Soluble Magnesium | 1200 (no SGV or GSSV) | mg/l  | 8.8           | 8.8           | 0                    |

**Table 28: Summary of Soil Contamination Levels (Metal Compounds)**

| Contaminant            | Screening Value         | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|------------------------|-------------------------|-------|---------------|---------------|----------------------|
| Total Sulphate         | 10,000 (no SGV or GSSV) | mg/kg | 375           | 6577          | 0                    |
| Total Sulphur          | 5,000 (no SGV or GSSV)  | mg/kg | 2217          | 2217          | 0                    |
| Water Soluble Sulphate | (no SGV or GSSV)        | mg/l  | 715           | 715           | -                    |
| Sulphide               | 250 (no SGV or GSSV)    | mg/kg | <10           | 133           | 0                    |
| Cyanide                | 66 (GSSV)               | mg/kg | <2            | <2            | 0                    |
| Loss on Ignition       | 25 (no SGV or GSSV)     | % w/w | -             | -             | -                    |
| Calorific Value        | 2,000 (no SGV or GSSV)  | kJ/kg | -             | -             | -                    |
| pH                     | <5.5 (no SGV or GSSV)   | -     | 4.2           | 7.9           | 3                    |

**Table 29: Summary of Soil Contamination Levels (Inorganic Compounds)**

| Contaminant   | Screening Value      | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|---------------|----------------------|-------|---------------|---------------|----------------------|
| TEM           | 500 (No SGV or GSSV) | mg/kg | <50           | 200           | 0                    |
| Total Phenols | 307.3 (SGV)          | mg/kg | -             | -             | -                    |
| Total PAH     | 15 (GSSV)            | mg/kg | -             | -             | -                    |
| TPH C5-C10    | 1.08 (GSSV)          | mg/kg | -             | -             | -                    |
| TPH C10-C28   | 27.36 (GSSV)         | mg/kg | -             | -             | -                    |
| TPH C28-C40   | 1206.6 (GSSV)        | mg/kg | -             | -             | -                    |

**Table 30: Summary of Soil Contamination Levels (Organic Compounds) 1%**

**SOM**

### Leachates

| Contaminant | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------|-----------------|-------|---------------|---------------|----------------------|
| Arsenic     | 10              | Ug/l  | <1            | 3             | 0                    |
| Cadmium     | 5               | Ug/l  | <1            | <1            | 0                    |
| Chromium    | 50              | Ug/l  | <3            | <3            | 0                    |
| Lead        | 25              | Ug/l  | <9            | <9            | 0                    |
| Mercury     | 1               | Ug/l  | <1            | <1            | 0                    |
| Selenium    | 10              | Ug/l  | <1            | 13            | 0                    |
| Copper      | 2000            | Ug/l  | <4            | <4            | 0                    |
| Nickel      | 50              | Ug/l  | <3            | 21            | 0                    |
| Zinc        | 5000            | Ug/l  | <20           | 76            | 0                    |
| Boron       | 1000            | ug/l  | <30           | 290           | 0                    |
| Sulphate    | 0.250           | g/l   | <0.010        | 0.877         | 3                    |
| Cyanide     | 50              | ug/l  | <20           | <20           | 0                    |
| pH          | <6.5            | Units | 4.8           | 8.9           | 1                    |
| PAH         | 0.1             | ug/l  | <0.10         | 14.8          | 2                    |
| TPH         | 10              | ug/l  | 40            | 1130          | 9                    |
| Phenol      | 0.5             | ug/l  | <0.5          | <0.5          | 0                    |

**Table 31: Summary of Leachate Test Results**

### Groundwater

| Contaminant | Screening Value | Units | Minimum Value | Maximum Value | No. Exceeding Screen |
|-------------|-----------------|-------|---------------|---------------|----------------------|
| Arsenic     | 10              | ug/l  | <1            | 2             | 0                    |
| Cadmium     | 5               | ug/l  | <1            | 9             | 1                    |
| Chromium    | 50              | ug/l  | <3            | <3            | 0                    |
| Lead        | 25              | ug/l  | <9            | 15            | 0                    |
| Mercury     | 1               | ug/l  | <1            | <1            | 0                    |
| Selenium    | 10              | ug/l  | <1            | 121           | 1                    |
| Copper      | 2000            | ug/l  | <4            | 5             | 0                    |
| Nickel      | 50              | ug/l  | 10            | 1898          | 3                    |
| Zinc        | 5000            | ug/l  | <20           | 4353          | 0                    |
| Boron       | 1000            | ug/l  | 150           | 1510          | 1                    |
| Sulphate    | 0.250           | g/l   | 0.613         | 7.243         | 5                    |
| Cyanide     | 50              | ug/l  | <20           | <20           | 0                    |
| pH          | <6.5            | Units | 5.0           | 7.1           | 1                    |
| PAH         | 0.1             | ug/l  | <0.1          | <0.1          | 0                    |
| TPH         | 10              | ug/l  | <10           | 40            | 2                    |
| Phenol      | 0.5             | ug/l  | <0.5          | <0.5          | 0                    |

**Table 32: Summary of Groundwater Test Results**

**APPENDIX H**  
**Gas and Groundwater Readings**

### North Gawber - Gas Monitoring Results

| Borehole | Reading            | 5-Dec-07 | 21-Jan-08 | 18-Feb-08 | 4-Mar-08 |
|----------|--------------------|----------|-----------|-----------|----------|
| BH101    | Methane (%)        | 0.0      | 0.0       | 0.0       | 0.0      |
|          | Carbon Dioxide (%) | 7.9      | 11.8      | 9.8       | 8.4      |
|          | Oxygen (%)         | 7.6      | 4.1       | 12.2      | 1.6      |
|          | Air Pressure (mB)  | 992      | 996       | 1030      | 1024     |
| BH104    | Methane (%)        | 0.0      | 0.0       | 0.0       | 0.0      |
|          | Carbon Dioxide (%) | 2.0      | 3.1       | 1.9       | 2.3      |
|          | Oxygen (%)         | 17.1     | 17.0      | 16.8      | 14.5     |
|          | Air Pressure (mB)  | 994      | 996       | 1031      | 1024     |
| BH105    | Methane (%)        | 0.0      | 0.0       | 0.0       | 0.0      |
|          | Carbon Dioxide (%) | 5.3      | 6.4       | 7.8       | 2.9      |
|          | Oxygen (%)         | 12.1     | 6.8       | 9.5       | 16.0     |
|          | Air Pressure (mB)  | 993.0    | 996       | 1031      | 1023     |
| BH109    | Methane (%)        | 0.0      | 0.0       | 0.0       | 0.0      |
|          | Carbon Dioxide (%) | 7.7      | 2.0       | 0.4       | 0.0      |
|          | Oxygen (%)         | 6.8      | 16.3      | 16.8      | 19.4     |
|          | Air Pressure (mB)  | 994      | 996       | 1030      | 1024     |
| BH112    | Methane (%)        | 0.0      | FLOODED   | 0.0       | 0.0      |
|          | Carbon Dioxide (%) | 2.7      |           | 0.0       | 0.0      |
|          | Oxygen (%)         | 18.5     |           | 19.1      | 19.4     |
|          | Air Pressure (mB)  | 993      |           | 1031      | 1024     |
| BH115    | Methane (%)        | 0.1      | 0.0       | 0.0       | 0.0      |
|          | Carbon Dioxide (%) | 11.5     | 4.8       | 5.3       | 6.9      |
|          | Oxygen (%)         | 1.2      | 10.9      | 5.4       | 8.2      |
|          | Air Pressure (mB)  | 994      | 997       | 1031      | 1024     |
| BH118    | Methane (%)        | 0.0      | 0.0       | 0.0       | 0.0      |
|          | Carbon Dioxide (%) | 0.0      | 2.3       | 3.4       | 2.1      |
|          | Oxygen (%)         | 20.1     | 19.9      | 17.8      | 16.0     |
|          | Air Pressure (mB)  | 995      | 997       | 1030      | 1024     |

North Gawber - Groundwater Readings

| Borehole | 5-Dec-07 | 21-Jan-08 | 18-Feb-08 | 4-Mar-08 |
|----------|----------|-----------|-----------|----------|
| BH101    | DRY      | 4.05      | 3.85      | 3.80     |
| BH104    | DRY      | 5.93      | 5.82      | 5.76     |
| BH105    | 6.97     | 7.03      | 7.20      | 7.15     |
| BH109    | 1.79     | 1.03      | 1.60      | 1.90     |
| BH112    | 0.42     | FLOODED   | 0.10      | 0.32     |
| BH115    | 5.47     | 4.38      | 4.17      | 4.01     |
| BH118    | 0.34     | 0.30      | 0.15      | 0.22     |

**North Gawber - Flow Monitoring Results**

| <b>Borehole</b> | <b>Reading</b>            | <b>5-Dec-07</b> | <b>21-Jan-08</b> | <b>18-Feb-08</b> | <b>4-Mar-08</b> |
|-----------------|---------------------------|-----------------|------------------|------------------|-----------------|
| <b>BH101</b>    | Total av. Litres/per hour | 0.0             | 0.0              | 0.0              | 0.0             |
| <b>BH104</b>    | Total av. Litres/per hour | 0.0             | 0.0              | 0.0              | 0.0             |
| <b>BH105</b>    | Total av. Litres/per hour | 0.0             | 0.0              | 0.0              | 0.0             |
| <b>BH109</b>    | Total av. Litres/per hour | 0.0             | 0.0              | 0.0              | 0.0             |
| <b>BH112</b>    | Total av. Litres/per hour | 0.3             | FLOODED          | 0.0              | 0.0             |
| <b>BH115</b>    | Total av. Litres/per hour | 0.0             | 0.0              | 0.0              | 0.0             |
| <b>BH118</b>    | Total av. Litres/per hour | 0.0             | 0.0              | 0.0              | 0.0             |