

UK COAL MINING LTD.

PROPOSED NORTH GAWBER MINING SCHEME

GEO-ENVIRONMENTAL ASSESSMENT

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1. INTRODUCTION

Scott Doherty Associates (**SDA**) were commissioned by UK Coal Mining Ltd. (**UK Coal**) to undertake a geo-environmental assessment of their proposed North Gawber Mining Scheme. The assessment entailed:

- an examination of the geological plans, reports and borehole data published by the British Geological Survey (**BGS**) or prepared by UK Coal, and the information contained in a Landmark 'Envirocheck' report;
- a review of previous ground investigations and other studies carried out on the Site;
- an intrusive investigation comprising trial pits and cable percussion boreholes to establish the degree and extent of any contamination on the Site and assess the risk of possible migration;
- an appraisal of the ground conditions determined by the intrusive investigation and comment on the measures likely to be required to assist surface mining and possible housing development.

2. SOURCES OF INFORMATION

2.1 General

Part of this study has entailed the collection and review of historical and technical information to determine the land use history at the Site and provide an assessment of the ground conditions. The principal sources of information used in the preparation of this Report are summarized below.

2.2 British Geological Survey

Maps and reports produced by the British Geological Survey (**BGS**) were examined to establish the solid and drift geology of the Site.

2.3 Historic Topographic Plans

Previous editions of the 1/10,560, 1/2500 and 1/1250 scale Ordnance Survey (**OS**) plans were inspected to establish the land use history. Recent OS maps were also examined to determine the nature of any post-war or more recent developments.

A summary of the site history is presented later in this report and extracts of the plans are provided in **Appendix A**.

2.4 Landmark Environmental Database

The Landmark Environmental Database produced by the Landmark Information Group (**Landmark**), comprises approximately fifty environmental data sets from a wide range of UK providers. The information obtained from the database permits an assessment to be made of the environmental sensitivity of a site. A search of the records contained in the database was carried out for an area extending 1km from the centre of North Gawber site.

A copy of the Landmark 'Envirocheck' Report is presented in **Appendix B**.

2.5 Previous Investigations

A desk top study report was compiled for the Site by British Coal in 1990. British Coal also carried out a large programme of exploratory drilling for surface coal reserves. The borehole logs are retained by UK Coal. A copy of the desk study report is provided in **Appendix C**.

2.6 Coal Authority

A Mining Report for the Site was obtained from the Coal Authority and a copy is presented in **Appendix D**.

3. SITE DESCRIPTION

3.1 Location and Topography

The Site occupies an area of approximately 15.5 hectares of derelict land between the villages of Mapplewell, Staincross and Blacker, approximately 1.5km ESE of Darton in the Barnsley District of the County of South Yorkshire (**Figure 1**).

National Grid Reference (**NGR**) for centre of Site: 433050E, 409650N.

The Site is bounded to the north by warehousing and factory buildings, whilst the village of Mapplewell lies to the west. The eastern boundary is formed by Carr Green Lane, beyond which lies an area of relatively modern housing. Commercial and industrial buildings, together with a small number of residential properties lie adjacent to the south-eastern boundary of the Site. An area of woodland extends along most of the southern boundary. This forms the northern margin of a reclaimed colliery spoil tip which is currently used as agricultural pasture.

The ground surface within the Site has been formed into a series of broad terraces. These increase in elevation from about 70m above Ordnance Datum (**AOD**) in the south-eastern corner to 96m AOD in the north at their highest point.

Surface runoff on the Site is generally directed towards the south-west where the ground is waterlogged. Deep erosion gullies have been formed in the deposits of colliery spoil that are exposed on the ground surface.

3.2 Land Use History

3.2.1 General

Early and more recent editions of Ordnance Survey (**OS**) plans were obtained from Landmark to establish the land use history of the Site. The following plans were consulted:

- (i) 1854 Edition - 1/10,560 scale;
- (ii) 1893 Edition - 1/2500 scale;
- (iii) 1894 Edition - 1/10,560 scale;
- (iv) 1906 Edition - 1/2500 scale;
- (v) 1907 Edition - 1/10,560 scale;
- (vi) 1918 Edition - 1/2500 scale;
- (vii) 1938 Edition - 1/10,560 scale;
- (viii) 1956 Edition - 1/10,560 scale;
- (ix) 1962 Edition - 1/2500 scale;
- (x) 1966 Edition - 1/10,560 scale;
- (xi) 1974 Edition - 1/2500 scale;

- (x) 1977 Edition - 1/1250 scale;
- (xi) 1980 Edition - 1/10,000 scale;
- (xii) 1983 Edition - 1/10,000 scale;
- (xiii) 1991 Edition - 1/10,000 scale;
- (xiv) 2000 Edition - 1/10,000 scale.

Copies of the relevant sections of these plans are provided in **Appendix A**.

3.2.2 1854 Edition OS Plan

Although it is difficult to discern accurate details from the 1/10,560 scale, 1854 Edition OS Plan, it is apparent that the Site covers an area of agricultural land. There has been some housing development along Carr Green Lane along the eastern boundary of the Site and a similar development to the north at Spring Gardens. 'Engine House', a solitary building, is shown just north of the centre of the Site and a well is recorded in the north-east corner suggesting that groundwater was present at a relatively shallow depth. Coal pits are shown approximately 700m to the east and 1km to the north of the Site boundary.

3.2.3 1893 Edition OS Plan

The 1/2500 scale OS Plan (1893 Edition) plan shows that significant development had occurred in the North Gawber area since 1854. The North Gawber Colliery Railway had been constructed, running across the northern part of the Site in an east-west direction. The eastern part of the railway terminated at Wentworth Road and the line extended approximately 7km to the west until it joined the Barnsley Branch of the Lancashire and Yorkshire Railway Line.

The plan also shows that North Gawber Colliery had been constructed extending from the eastern boundary of the proposed development Site to 'Engine House' at its centre. Coke ovens had been built just to the south of the railway line, where sidings had been laid to facilitate the movement of materials. An air shaft is marked 100m to the south-west of the coke ovens. The main Colliery access shaft is shown in the northern part of the Site and another mine opening is recorded on the north-eastern boundary. An additional shaft, gasometer and several reservoirs are shown just outside the north-eastern boundary of the Site. Several footpaths are shown to extend NW-SE across the Site and assume an almost parallel orientation.

The plan again shows a stream flowing in a southerly direction through the centre of the Site. A second watercourse follows an almost parallel course to the east of Carr Green Lane.

3.2.4 1894 Edition OS Plan

The 1/10,560 scale, 1894 Edition OS Plan records no developmental changes since the publication of the 1893 plan.

3.2.5 1906 Edition OS Plan

The 1/2500 scale, 1906 Edition OS Plan shows that there had been little or no development on and around the Site since 1894. Additional housing is shown along Spark Lane to the north-west of the Site. Some areas of railway track had been removed to the north of the coke works. The air-shaft shown on the 1894 OS plan is no longer recorded on the 1906 Edition.

3.2.6 1907 Edition OS Plan

None of the details shown on the 1/10,560 scale, 1907 Edition OS Plan is significantly different from those recorded on the 1906 plan.

3.2.7 1918 Edition OS Plan

The 1/2500 scale, 1918 Edition OS Plan shows that there had been few developmental changes since 1907. Additional storage tanks have been constructed in the north-east corner of the Site. The colliery spoil tips had increased in size and had been extended to the north of the railway track. A spoil heap is also recorded to the south of the coke ovens.

3.2.8 1938 Edition OS Plan

The 1/10,560 scale, 1938 Edition OS Plan shows that apart from the extension of the spoil heaps in a westerly direction across the Site, there had been very little change since 1918.

3.2.9 1956 Edition OS Plan

The 1/10,560 scale, 1956 Edition OS Plan indicates that there had been significant change across the Site since 1938. The coke ovens and associated structures had been demolished, but an aerial ropeway has been constructed running approximately 470m from a 'loading point' to a 'deposit point' located on a large spoil heap to the south-west of the Site.

The plan also indicates that there had been further building development in the north-east corner of the Site, and that the volume and extent of the spoil heaps had increased in the north.

3.2.10 1962 Edition OS Plan

The 1/2500 scale, 1962 Edition OS plan shows that four lagoons had been constructed along and just outside the southern boundary of the Site. New drains are indicated adjacent to the aerial ropeway. A single electricity pylon had been erected on the Site and the cables are shown to extend parallel to and approximately 50m inside the eastern boundary. The spoil tip in the northern part of the Site had again increased in size.

3.2.11 1966 Edition OS Plan

The 1/10,560 scale, 1966 Edition OS Plan shows that there had been no significant development on the Site since the publication of the 1962 Plan.

3.2.12 1973 Edition OS Plan

The 1/10,000 scale, 1973 Edition OS Plan shows the colliery spoil heaps in the northern, central and southern parts of the Site as disused. The aerial cable had been dismantled with only the 'loading point' still remaining.

3.2.13 1974 Edition OS Plan

The 1974 Edition OS Plan (1/2500 scale) shows that four slurry ponds had been created in the southern part of the Site. Conveyors had been constructed around the existing mine buildings, the principal of which was used to transport spoil in a south-easterly direction to the North Gawber – Hill End Tip. A stream is shown to flow into the Site from a source just outside the north-west corner and then assume a south-easterly course. Drains are also shown to extend across the Site and both a point of issue and a sink are shown 50m to the east of Carr Green Road.

3.2.14 1977 Edition OS Plan

The 1977 Edition OS Plan (1/1250 scale) shows that another four slurry lagoons had been formed in the western part of the Site. Other lagoons are also recorded in the southern and central parts. A small area of woodland had been developed along the eastern boundary of the Site.

3.2.15 1983 Edition OS Plan

The 1/10,000 scale, 1983 Edition OS Plan indicates that no significant developmental changes had occurred at the Site since the publication of the 1977 Plan.

The Plan clearly shows the route of the main conveyor starting at the mine buildings and depositing materials off-Site at the Hill End Refuse Tip to the south-east.

Examination of a Spoil Tip Plan compiled by the National Coal Board and revised in 1983 shows that the area immediately to the south and west of the mine buildings on the southern side of the North Gawber Colliery Railway is marked as a coal stocking area. A copy of the Spoil Tip Plan is included in **Appendix A**.

3.2.16 1991 Edition OS Plan

The 1/10,000 scale, 1991 Edition OS Plan shows that there had been considerable changes on the Site since the 1983 survey. The North Gawber Colliery Railway had been dismantled. Similarly, the main Colliery buildings (including conveyors) had been completely demolished. An area of colliery spoil just outside the north-west boundary of the Site had been reclaimed to create a football ground.

The buildings and reservoirs shown in the 1983 OS Plan and situated to the north of the Site had also been demolished and drained. The area is now occupied by a depot and factory units. All of the slurry ponds had been backfilled, but a pond had been created in the central part of the Site. This was fed by two drains running from the north-west and north-east. An area of deciduous woodland had been developed just outside the southern boundary of the Site and a drain is shown to run through this area.

3.2.17 2000 Edition OS Plan

The 2000 Edition OS Plan (1/10,000 scale) shows that there had not been any development on the Site since the 1991 survey. Several drainage sinks are recorded across the Site: one is shown in the north-west corner and another just outside the south-eastern boundary.

3.2.18 Recent Surveys and Developments

The 1/1250 scale Surface Features Plan (Drg. No. 175-D01) provided by UK Coal and dated July 2004 shows that there have been few changes on the Site since the year 2000. Areas of concrete hard standing are shown in its northern part, and the various culverts and drains are more clearly defined than on earlier OS plans.

The Site continues to form an area of dereliction. Colliery spoil and concrete hard standing cover most of the ground surface. Vegetative cover is generally sparse, except in the southern part of the Site. Gas venting pipes have been installed adjacent to the northern boundary.

3.2.19 Implications for Development and Potential sources of Contamination

Attention is drawn to the following factors, which represent potential hazards and are likely to have a bearing on the development of the Site:

- (i) the presence of significant quantities of colliery spoil;

At least some of the colliery spoil will have been loosely tipped and is unlikely to provide a suitable foundation for housing development without treatment or compensatory measures in the foundation design.

The weathering of colliery spoil tips leads to the oxidation of widely distributed metallic sulphides, of which iron pyrites is by far the most common. This increases the concentration of sulphate. Galena [PbS], sphalerite [ZnS], arsenopyrite [FeAsS], chalcopyrite [CuFeS₂] and pentlandite [(NiFe)S] are also present in much smaller proportions, but these undergo similar reactions. Solubility of the resulting metallic salts is increased by the consequent acidity of the water.

- (ii) the location of a former coke works facility;

The historic OS plans suggest that the coke works were of the beehive type or of similar construction and this has been confirmed by British Coal (1990). There is no evidence of circular tanks that might otherwise have stored tars and fractionated hydrocarbons. A gasometer is shown to the north-east of the Site, but there does not appear to be a direct association with the coke works and no evidence of purification towers. (These would otherwise provide a source of cyanide wastes or 'blue billy'.) The volatile matter will have been burned off, thereby reducing the risk of hydrocarbon contamination. However, the ground may well have been contaminated by heavy metals that naturally occur in coal and are concentrated by the carbonisation process. They are also likely to have been mobilised in solution along with certain hydrocarbons (e.g. phenols and polycyclic aromatic hydrocarbons) during the external quenching of the hot coke. The contamination might have been spread where the coke was being loaded onto railway wagons or had been stockpiled.

- (iii) the site of a former colliery;

A number of the buildings housed machinery and/or were used for maintenance purposes. Hydrocarbon contamination might have occurred due to the spillage of fuel and lubricating oils.

- (iv) a number of disused mine openings;

Mine openings represent a potential hazard if they are untreated.

- (v) the possible migration or importation of contaminants from external sources.

Given the long history of industrial development and the railway connections that were provided, it is entirely possible that contaminated materials were imported.

4. GEOLOGY

4.1 Published Information

4.1.1 British Geological Survey

A copy of the 1/50,000 scale geological map (Barnsley Sheet 87. Solid & Drift) is presented as **Figure 2**. This shows that the Site is underlain by a succession of mudstones, siltstones, sandstones, coal seams and seatearths forming part of the Duckmantian (Westphalian 'B') Stage of the Upper Carboniferous Coal Measures. This succession extends from above the Kent's Thick (AZ) seam, which outcrops within the Site, to the Barnsley Rider (AY) and Barnsley (AVX) seams. No superficial cover is shown within the Site, but an area of glacial boulder clay has been recorded to the north and east. Deposits of alluvium are present along the course of the River Dearne.

Reference has been made to 'Geology of the Country around Barnsley' (Mitchell et al., 1954). This states that in the 60m or so of strata separating the Kent's Thick (AZ) and the Barnsley (AVX) seams, a thick sandstone is present a few metres above the lowermost coal horizon in the Dearne valley, east of Barugh. This is known as the 'Barnsley Rock'. The Kent's Thick (AZ) lies within an argillaceous succession, together with a number of thinner, unnamed coal seams. Another sandstone horizon is present within the overlying strata and this forms a local escarpment.

4.1.2 Landmark 'Envirocheck' Report

The 'Envirocheck' report (**Appendix B**) records that the Site is underlain by Carboniferous Coal Measures strata. The report also makes reference to the National Radiological Protection Board, which suggests that between 1 and 3% of homes in the North Gawber area are above the 'Action Level' with regard to natural radon gas emissions. The BGS indicates that basic radon protection measures will be required for any residential development on the Site and this is also confirmed by the Building Research Establishment (BRE, 1999).

4.2 Previous Investigations

4.2.1 General

British Coal produced a report entitled, 'Desk Top Study of a Possible Opencast Site at Gawber' in December 1990 (British Coal, 1990a). This report not only covers the area of UK Coal's current interest at North Gawber, but also provided information on many of the surrounding collieries, tips, chemical works, quarries and industrial works. Information relevant to the North Gawber Colliery Site has been extracted from the 1990 Desk Top Study to assist in the production of this Report. It appears that no ground investigations were carried out by British Coal to investigate potential contamination, but the Site was extensively drilled in the early 1990's for surface coal reserves. The latter comprised 104 rotary air flush boreholes.

UK Coal has subsequently produced the following 1/2500 scale plans based upon British Coal borehole data:

- (i) Thickness of Made Ground Plan;
- (ii) Level of Base of Made Ground Plan;
- (iii) Thickness of Glacial Clay Plan;
- (iv) Total Thickness of Superficial Deposits Plan;
- (v) Rockhead Level Plan;
- (vi) Geology Plan;
- (vii) 1/1000 scale Geological Cross Section.

Copies of these plans and sections have been examined by SDA as part of this study and are retained by the client.

4.2.2 Summary of British Coal's Site Investigations

4.2.2.1 Made Ground

The Thickness of Made Ground Plan shows that made ground forms a continuous cover across the Site. The thicknesses range from 0.6m in the southernmost part of the Site to 9.0m just north of its central part. The average thickness for the whole Site totals some 3.9m.

4.2.2.2 Glacial Clay

Exploratory drilling has proved a thin deposit of glacial clay and this extends over most of the Site. The Thickness of Glacial Clay Plan shows that it ranges in thickness from 0.0m, representing no cover, to a maximum of 4.4m in the southernmost part of the Site. However, most of the Site is covered by deposits ranging from 0.7 to 1.7m in thickness. No glacial clay is present just inside the south-western boundary and there are several areas in the north where none was proven.

4.3 Underground Mining

Examination of the Coal Authority's Mining Report (**Appendix D**) shows that the Site is within the likely zone of influence of underground workings in nine coal seams extending up to 340m below ground level (**bgl**). The last recorded date of working is 1981. There is presently no mining activity in the area.

The Coal Authority Report also identified a total of eight mine shafts or adits located on the Site or within 20m of its boundary. Four of these structures have been identified using historical plans and site observations, three of which lie within the Site.

The Site is within 800m of the Barugh Bridge surface mine for which a conditional extraction licence was granted in 1994.

Copies of the abandonment plans for the Kent's Thick (AZ) seam supplied by UK Coal indicate the locations of five shafts and four adits within the Site boundary. These were used to access the workings in the Kent's Thick and Barnsley (AVX) seams. The details from the abandonment plans have been overlaid on the topographic survey and indicate the location of the remaining mine entries not recorded on the OS plans. An extract of the Kent's Thick abandonment plan is presented as **Figure 3**.

One of the abandonment plans shows a small area of backfilled surface excavations along the outcrop of the Kent's Thick (AZ) seam at its southernmost point within the Site. The excavations cover approximately 0.4 ha and were developed during May 1974 at the time of the construction of the slurry ponds (Section 3.2.13).

5. HYDROLOGY AND HYDROGEOLOGY

5.1 Hydrology

5.1.1 Rainfall

The Meteorological Office's website indicates that the long term average rainfall for the Sheffield area (1971 to 2000) is 131.2mm.

5.1.2 Surface Water and Catchment

The Site lies within the catchment of the River Dearne.

There is presently only one watercourse on the Site which flows in a south-easterly direction across its southern half. The stream is culverted for approximately half of its length.

Surface runoff is generally directed towards the southern part of the Site and is largely unimpeded due to the sparse cover of vegetation. Erosion gullies of up to 1m in depth have formed where surface gradients are more excessive (e.g. along the margins of the colliery spoil terraces). The southern part of the Site is waterlogged due to poor drainage and low surface gradients, but the water eventually discharges into the watercourse to the south-east.

5.1.3 Discharge Consents

Information obtained from the Landmark 'Envirocheck' report (**Appendix B**) indicates that there are three discharge consents within 100m of the Site (**Table 1**) and a further seventeen consents within 1km. Eighteen of these consents are held by Yorkshire Water Services Ltd. and the remainder by Darton Rural District Council (now Barnsley District Council). The receiving watercourse is the River Dearne or its tributaries, although not always stated, and the discharges fall into one of the following categories:

- (i) Sewage Discharges – Final/Treated Effluent;
- (ii) Trade Discharges – Site Drainage;
- (iii) Surface Water Effluent.

Twelve consents are recorded as having been revoked.

Operator (Reference No.)	NGR	Distance from Site (km)	Discharge Type	Receiving Watercourse
Yorkshire Water Services Ltd (C4139)	433080 409290	0.062	Sewage discharges – Storm Overflow/Storm Tank	Unnamed tributary of River Dearne
Yorkshire Water Services Ltd (S/UD/51)	433100 409280	0.077	Sewage Effluent Discharge – Storm Effluent	Not Supplied
Yorkshire Water Services Ltd (S/UD/51)	433100 409280	0.081	Sewage Effluent Discharge – Storm Effluent	Not Supplied

Table 1 Summary of Discharge Consents within 100m of the Site

5.1.4 Licensed and Unlicensed Surface Water Abstractions

Information obtained using a Landmark ‘Envirocheck’ report (**Appendix B**) indicates that there are no licensed surface water abstractions within 1km of the centre of the Site. There are no known unlicensed abstractions.

5.1.5 Water Quality

The Landmark ‘Envirocheck’ report (**Appendix B**) indicates that the River Dearne has been classified as GQA Grade C (‘Fairly Good’). There are also records of fourteen pollution incidents to controlled waters within 1km of the Site, of which nine have been categorised as ‘minor incidents’, three as ‘significant’ and the remaining two as ‘major’ by the Environment Agency. Details of the significant and major pollution incidents are summarized in **Table 2**.

Property Type	NGR	Distance from Site (km)	Pollutant Type	Receiving Watercourse/ Severity of Incident
Water Company Sewage: Sewage Treatment Works	432510 408900	0.72	Unknown	Freshwater Stream/River ‘Major’ incident
Water Company Sewage: Sewage Treatment Works	432500 408900	0.72	Unknown	Freshwater Stream/River ‘Major’ incident
Water Company Sewage: Sewage Treatment Works	433000 408800	0.55	Sewage – Treated Effluent	Freshwater Stream/River ‘Significant’ incident
Water Company Sewage: Sewage Treatment Works	432500 408900	0.72	Sewage Sludge	Freshwater Stream/River ‘Significant’ incident
Water Company Sewage: Foul Sewage	432200 409100	0.72	Unknown Sewage	Freshwater Stream/River ‘Significant’ incident

Table 2 Summary of Pollution Incidents within 1km of the Site

The Landmark ‘Envirocheck’ report (**Appendix B**) also shows that seven ‘Substantiated Pollution Incidents’ have been registered. All of these incidents have been classed as having ‘minor’ or ‘no’ impact on the surrounding hydrology.

5.2 Hydrogeology

5.2.1 General

The Landmark ‘Envirocheck’ report (**Appendix B**) indicates that the bedrock strata are classified as a ‘minor aquifer’ of variable permeability by the Environment Agency. The overlying soils are classed as, ‘*soils of high leaching potential (U): soils in which pollutants are unlikely to penetrate the soil layer because water movement is largely horizontal or they have large ability to attenuate diffuse pollutants. Lateral flow from these soils contributes to groundwater recharge elsewhere in the catchment*’. However, the soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere, and the Environment Agency therefore assumes a worst case vulnerability classification (H), until proved otherwise.

5.2.2 Superficial Deposits

5.2.1.1 *Made Ground*

The deposits of made ground are generally granular in nature and will allow at least some surface water to infiltrate at ground surface (hydraulic conductivities in the range 10^{-4} to 10^{-6} m/s). It is expected that some groundwater will accumulate along the interface with the underlying glacial deposits.

5.2.1.2 *Glacial Deposits*

Deposits of glacial till will generally resist surface infiltration because of their low hydraulic conductivity (possibly $<10^{-9}$ m/s) and less than 20% of the total rainfall may ultimately penetrate the underlying bedrock where it is present in substantial thicknesses (e.g. in the southern part of the Site). The groundwater conditions can be summarized as follows:

- (i) the establishment of downward drainage profiles with the development of negative pore pressures during periods of prolonged dry weather;
- (ii) under-drainage where drawdown is present in the bedrock strata;
- (iii) the presence of perched groundwater systems where discrete pockets or lenses of sand and gravel are present within the glacial till.

Where the cover is relatively thin, as is generally the case, the underlying bedrock will be directly recharged by surface infiltration.

5.2.3 Bedrock Strata

The intrinsic permeability of the various rock types forming the Coal Measures succession is very low and strongly anisotropic. Fissures principally control groundwater flow. The hydraulic conductivity of unworked strata generally lies in the range 10^{-6} to 10^{-7} m/s, but may be at least one order of magnitude lower perpendicular to the bedding.

The hydraulic properties of the strata are radically changed by the presence of old workings. The conductivity may increase by orders of magnitude and open voids can give rise to free flow. This is due to the following factors:

- (i) dilation of existing natural joints and fractures;
- (ii) separation of bedding planes due to the underlying collapse of strata into voids;
- (iii) wholesale brittle failure of the rockmass and the creation of a large number of fractures.

Old workings are present in the Kent's Thick (AZ) and Barnsley (AVX) seams and these extend close to outcrop.

5.2.4 Licensed and Unlicensed Groundwater Abstractions

The Landmark 'Envirocheck' report (**Appendix B**) indicates that there is one licensed groundwater abstraction within 2km of the Site (**Table 3**). There are no known unlicensed abstractions.

Operator (Reference No.)	NGR	Distance from Site (km)	Abstraction Source	Purpose of Abstraction
Shaw Carpets Ltd. 2/27/08/114	431400 409700	1.32	Groundwater	Commercial use.

Table 3 Summary of Licensed Groundwater Abstractions within 2km of the Site

5.2.5 Landfill Sites

Information obtained from the Landmark 'Envirocheck' report (**Appendix B**) indicates that there are four local authority recorded landfill sites, five commercially registered sites, one commercially registered waste transfer site and one commercially registered waste treatment or disposal site located within 1km of the Site. Details are summarized in **Table 4**.

The 'Envirocheck' report also indicates that the Site lies adjacent to an area of adopted Green Belt and within an area classified as a nitrate vulnerable zone.

License Holder	NGR	Distance from Site (km)	Waste Type
Barnsley Metropolitan Borough Council	433430 409480	0.22	Not supplied
Barnsley Metropolitan Borough Council	432360 409300	0.48	Not supplied
Barnsley Metropolitan Borough Council	434000 410040	0.79	Not supplied
Barnsley Metropolitan Borough Council	431880 409410	0.87	Not supplied
Blacker Hill Quarries Ltd. *	433260 409530	0.043	Construction and demolition wastes.
National Coal Board*	432570 409370	0.26	Construction and demolition wastes.
William Freeman & Co. *	433860 409840	0.59	Commercial and industrial waste. Soil, subsoil.
C Birkinshaw & Sons Ltd **	432090 409370	0.67	Construction and demolition waste. Excavated natural materials, hardcore.
Shaw Carpets Ltd *	431930 409480	0.80	Construction and demolition waste. Industrial non-hazardous waste. Soil and subsoil
B Eaton* (Waste Transfer Site)	433420 409540	0.18	Commercial and industrial non-hazardous waste. Industrial and non-hazardous. Potentially combustible
Mapplewell Auto Salvage (Waste treatment/disposal)	433450 409720	0.18	Scrap motor vehicles. Tyres

* - Licence lapsed/cancelled/defunct/not applicable/surrendered.

** - Licence revoked.

Table 4 Details of Landfill, Waste Transfer and Treatment/Disposal Sites within 1km of the Site

5.2.5 Groundwater Quality

There are no details of groundwater quality recorded in the Landmark 'Envirocheck' report (**Appendix B**) and there are no known groundwater pollution incidents within 1km of the proposed Site.

The quality of the groundwater in the colliery spoil and bedrock strata will have been adversely affected by the presence of metallic sulphides. This will have increased, amongst other things, the concentrations of soluble sulphate.

6. INTRUSIVE INVESTIGATION AND LABORATORY ANALYSIS

6.1 General

The principle aim of the ground investigation was to investigate the nature and thickness of the superficial materials present on the Site, and the presence of any contamination. The investigations were carried out generally in accordance with BS 10175 (2001).

A series of twenty nine trial pits (nos. TP1 to 29) and twenty boreholes (nos. 1 to 20) were excavated on the Site to assess the ground conditions. The trial pits were largely concentrated in the northern part of the Site where the superficial deposits are thinner. Attention was particularly drawn to the site of the former coke ovens and railway sidings.

6.2 Trial Pits

The trial pits were excavated using a JCB 3CX hydraulic excavator to depths ranging from 0.8 to 3.5m. Some of the excavations were terminated due to very large buried structures.

The trial pits were logged in accordance with BS5930 (1999), particular attention being paid to the types of made ground and the presence of water bearing strata. Small disturbed samples were taken at discrete locations within the trial pits for chemical analysis.

The trial pit logs are provided in **Appendix E** and their locations are shown on **Figure 4**.

6.3 Boreholes

The boreholes were excavated using a Dando 2000 cable percussion rig to depths ranging from 4.4 to 14.1m bgl. The process had to be repeated at some locations due to the presence of concrete obstructions. Bulk samples were taken at regular intervals and at observable changes in stratum, and these were then sub-sampled for chemical analysis. The samples were described in accordance with BS5930 (1999) and logs were produced using the computer software package, 'Holebase'.

Gas and groundwater monitoring installations were constructed in six of the boreholes (nos. 4C, 5, 9, 13, 17 and 18).

The borehole logs are provided in **Appendix F** and their locations are shown on **Figure 4**.

6.4 Laboratory Analysis

Chemical testing was carried out on selected samples by Derwentside Environmental Testing Services Ltd (DETS) using UKAS accredited laboratory facilities and in accordance with schedules prepared by SDA.

The soil samples were analysed for arsenic, cadmium, chromium, lead, mercury, selenium, copper, nickel, zinc, water soluble boron, cyanide, sulphide, sulphate, pH, total phenols, toluene extractable matter (**TEM**) and polycyclic aromatic hydrocarbons (**PAH**). In addition, samples with elevated TEM and PAH levels were further analysed for total petroleum hydrocarbons (**TPH**) and speciated compounds. Leachate tests were also carried out on selected samples with elevated heavy metal concentrations and in accordance with an Environment Agency approved procedure.

The laboratory test certificates are provided in **Appendix G**.

6.5 Gas Monitoring and Groundwater Sampling

The concentrations of methane, carbon dioxide and oxygen were recorded in each of the monitoring stations on the 1st and 29th September 2004 using a GasData LMSx gas detector. Groundwater samples were also taken from a number of installations, dependent upon the volume of available fluid. The installations were initially purged to remove approximately three times the volume of stored water and sampled using a 'Waterra' pump. The samples were then stored in a cool box and delivered to DETS the following day.

7. GROUND CONDITIONS

7.1 General

The Site comprises variable types of made ground overlying thin, discontinuous deposits of glacial till and bedrock strata. In parts of the site where no glacial till is present, the made ground directly overlies the bedrock. Three geological cross sections (A-A', B-B' and C-C') have been compiled using the borehole and trial pit information. These are presented as **Figure 5**.

7.2 Made Ground

Made ground was encountered at ground surface in all the trial pits and cable percussion boreholes ranging in thickness from 3.5 to 13.8m. The thickest deposits were encountered in the north-western part of the Site, adjacent to the football ground.

Three principal types of made ground were encountered on the Site, although localized areas contained significantly different materials.

- (a) Coarse colliery discard – firm black, grey, brown and yellow, sandy, gravelly clay with cobbles of coal, sandstone, mudstone and siltstone. This material was encountered in the majority of trial pits and boreholes.
- (b) Coarse colliery discard – black brown and red, slightly clayey sand and gravel, comprising coal, mudstone, burnt shale and sandstone.
- (c) Coarse colliery discard – red burnt mudstone ('shale') was encountered both as a constituent of the gravel sized clasts within other materials and as discrete lenses.

Other materials encountered within the deposits of made ground are as follows:

- (i) silver coloured coke works(?) slag towards the eastern and north-eastern parts of the Site;
- (ii) bitumen coated aggregate (tarmacadam), paving slabs and kerb stones in the north-eastern part of the Site;
- (iii) steel cables and girders, and wooden sleepers in the central and north-eastern part of the Site;
- (iv) thick, reinforced concrete and brick foundations also located in the central and north-eastern part of the Site;
- (v) fine colliery discard – silt sized particles of coal and burnt shale.

7.3 Topsoil

Evidence of a former topsoil horizon was observed below the deposits of made ground in at least one trial pit excavation (no. TP04). This suggests that the colliery spoil was partly spread over previously untreated ground, a common practice prior to the 1969 Aberfan disaster.

7.4 Glacial Till

Glacial till was encountered in the majority of the trial pits and boreholes. The till comprises firm to stiff, light brown, mottled grey, sandy, gravelly clay and, where present, ranges in thickness from 0.3 to 2.5m. It is underlain by weathered bedrock.

7.5 Bedrock

All of the boreholes encountered moderately to highly weathered bedrock at depths of between 3.6 and 13.8m bgl with the exception of those that encountered obstructions. The bedrock comprised weathered mudstone, siltstone and fine grained sandstone.

One trial pit (no. TP22) in the north-eastern corner of the Site encountered possible sandstone bedrock at 2.9m bgl.

7.6 Groundwater

The majority of trial pits did not encounter groundwater, although relatively moist horizons were encountered in some of the excavations. Groundwater was encountered in cable percussion borehole nos. 4 to 4C, 5, 9, 13, 17 and 18, but was only observed to rise in borehole nos. 4C and 5. Standpipes were installed in most of these boreholes for monitoring and sampling purposes. A summary of the recorded water levels is provided in **Table 5**. These show that perched systems are locally developed where downward infiltration is impeded by glacial till or intense weathering in the underlying bedrock. In the southern part of the Site, the area immediately adjacent to the watercourse was found to be saturated to ground level.

Borehole No.	01/09/04		29/09/04		Horizon(s)
	Depth (m bgl)	Level (m AOD)	Depth (m bgl)	Level (m AOD)	
4C	0.35	75.15	0.93	74.57	Made ground and highly weathered sandstone/siltstone.
5	0.60	72.00	0.66	71.94	Made ground, glacial till and sandstone/siltstone.
9	3.20	76.10	3.45	75.85	Made ground.
13	4.90	74.20	Dry	-	Made ground, glacial till and siltstone.
17	3.20	80.90	3.25	80.85	Made ground.
18	5.20	85.20	5.45	84.95	Made ground.

Table 5 Summary of Standpipe Monitoring Results

It is expected that the superficial deposits are under-drained by continued abstraction from the Coal Measures strata. However, significant recovery will have occurred since the closure of the remaining collieries in the Barnsley area. Exploratory drilling by British Coal suggests that the workings in the Kent's Thick (AZ) seam are dewatered within the depth range it is proposed to excavate. However, this should be verified by installing piezometers.

7.7 Gas

The gas monitoring results are presented in **Table 6**. These indicate the complete absence of methane. However, the carbon dioxide concentrations exceed 1.5% by volume in most of the borehole installations. This threshold represents the level at which the risks posed to any future housing development should be carefully assessed. The National House Building Council (NHBC) may require up to 12 months of monitoring on at least a monthly basis before they will 'underwrite' any residential properties. They may insist that gas protection measures are incorporated into the building foundations (e.g. membranes in the floor slab and extended across the cavity walls). Further monitoring should also be undertaken to assess the variations in gas concentration with changes in atmospheric pressure. 'Sharp falls' in atmospheric pressure can significantly increase gas emissions. These are defined by British Coal (1990b) as a fall of 3-8 mB in 8 hours and result from the passage of Atlantic type weather systems.

Borehole No.	01/09/04				29/09/04			
	Methane (% v/v)	Carbon Dioxide (%v/v)	Oxygen (% v/v)	Atmospheric Pressure (mB)	Methane (% v/v)	Carbon Dioxide (%v/v)	Oxygen (% v/v)	Atmospheric Pressure (mB)
4	0	0.5	1006	4	0	0.4	15.1	1005
5	0	3.7	1007	5	0	0	20.2	1005
9	0	2.2	1006	9	0	2.0	17.7	1005
13	0	5.4	1006	13	0	2.2	18.7	1005
17	0	2.2	1006	17	0	3.4	15.6	1005
18	0	2.8	1004	18	0	2.4	16.7	1005

Table 6 Summary of Gas Monitoring Results

If the old workings in the Kent's Thick (AZ) and Barnsley (AVX) seams are dewatered then they may represent an important source of 'stythe': a gaseous mixture of carbon dioxide, nitrogen and depleted levels of oxygen produced by the oxidation of coal. However, the gas concentrations recorded in the boreholes are thought to be the result of chemical oxidation of coal particles in the made ground, rather than the result of migration from deeper levels, though this may be unimpeded in some parts of the Site due to the paucity of impervious glacial cover. (The disused mine openings could also form important migration pathways.) Nevertheless, the risks posed by stythe will have to be assessed as part of the proposed surface mining and subsequent housing developments. Protective measures might be required for building structures (e.g. gas proof membranes in floor slabs or venting of underfloor spaces).

(Note. Problems have recently been experienced with the migration of methane gas in Barnsley.)

8. CONTAMINATION ASSESSMENT

8.1 General

A total 99 soil samples and 4 groundwater samples were submitted for detailed analysis at the laboratory of Derwentside Environmental Testing Services Ltd. The test results were compared with published guideline levels to make an initial (screening) assessment of the various contaminants. The following guidelines have been used to carry out the assessment.

- (a) Soil Guideline Values (SGV's) provided by the CLEA model and developed at the Centre for Research into the Built Environment at Nottingham Trent University (Environment Agency, 2002). Four land-use categories are considered: residential, with and without plant uptake; allotments; and commercial/industrial. The most stringent category, residential with plant uptake, has been assumed in this study. At present the SGV's cover only a limited number of contaminants. Use of the CLEA model to produce SGV's for additional contaminants requires the entry of approved toxicological data, most of which are not currently available.
- (b) Guidelines published by the Dutch Government (Dutch Ministry of Housing, 2002). Two assessment levels are provided in the Dutch guidelines: 'intervention' and 'target' levels. The 'intervention' level indicates when the functional characteristics and properties of soil and groundwater of relevance to humans, animals and plants have been seriously reduced or when there is a threat of such a reduction. It represents the level of contamination above which there is a case of significant contamination. The 'target' level indicates the level at which there is no significant contamination. (It should be stressed that these levels are considered to be conservative and that compliance with the Dutch guidelines is not a legal requirement in the UK.) For the purposes of this study, reference has been made to the Dutch 'intervention' level.

It should be noted, however, that a number of contaminants are not covered in either the CLEA model or Dutch guidelines. These include water soluble boron, sulphide and sulphate where an assessment is made based on experience gained at other sites.

8.2 Assessment of Soil Contamination

8.2.1 General

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

- (a) **Mean Value Test.** The sample mean for a small number of samples may be significantly less than the true (population) mean. Therefore, a decision to take ‘no remedial action’ based on a small number of samples may not be adequately health protective. The test entails the determination of the 95% confidence limits of the measured mean and to compare the upper 95th percentile with the Soil Guideline Value for a particular contaminant.
- (b) **Maximum Value Test.** This test 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.

8.2.2 Screening Assessment

The results of the screening assessment are presented in **Table 7**.

Contaminant	Screening Value	Units	Minimum Value	Maximum Value	Number Exceeding Screening Value
Arsenic	20	mg/kg	3	120	28
Cadmium	8	mg/kg	<0.2	2.4	0
Chromium (total)	130	mg/kg	<1	91	0
Lead	450	mg/kg	<1	52	0
Mercury	8	mg/kg	<0.3	0.4	0
Selenium	35	mg/kg	<0.3	3.2	0
Copper	190	mg/kg	10	200	1
Nickel	50	mg/kg	2	68	3
Zinc	720	mg/kg	16	370	0
Boron	Assume 3	mg/kg	0.4	2.4	0
Cyanide	50	mg/kg	<1	<1	0
Sulphide	Assume 250	mg/kg	<10	550	4
Sulphate	Assume 0.2	%	0.02	6.01	54
Acidity/alkalinity	<5		3.3	10.5	21
Phenol (total)	40	mg/kg	<0.2	4.6	0
TEM	5000	mg/kg	<40	12000	4
PAH (total)	40	mg/kg	<5	170	5
TPH (total)*	1000	mg/kg	1800	11700	4

* Denotes a contaminant where only selected samples were tested.

Table 7 Summary of Contamination Levels for Soil Samples

The screening assessment indicates that levels of arsenic, copper, nickel, sulphide, sulphate, toluene extractable matter (TEM), polycyclic aromatic hydrocarbons (PAH) and total petroleum hydrocarbons (TPH) are above the screening levels used. However, levels of copper and nickel are not significantly elevated and are not widespread.

8.2.3 Mean Value Test

It is usual practice to consider only those materials present within 2m of ground surface in the mean value test, as it is considered that exposure below this depth is unlikely. However, UK Coal proposes to undertake surface mining on the Site and all the analyses results have therefore been considered. Where samples have returned a result below the laboratory detection limit for the analytical method used, the detection limit for that contaminant has been adopted.

The mean value test has been carried out for all contaminants where at least one result was above the screening value. The results are presented in **Table 8**.

Contaminant	Screening Value	Units	Mean Value Test Result (US ₉₅)
Arsenic	20	mg/kg	23.61
Copper	190	mg/kg	38.62
Nickel	50	mg/kg	21.72
Sulphide	250	mg/kg	61.38
Sulphate	Assume 0.2	%	0.79
TEM (total)	5000	mg/kg	903.93
PAH (total)	40	mg/kg	14.99
TPH (total)*	1000	mg/kg	14490.64

* Denotes a contaminant where only a small number of samples were tested.

Table 8 Mean Value Test Results for Soil Samples

The mean value test indicates that the average (US₉₅) results for copper, nickel, sulphide, TEM and PAH are significantly below the screening levels used and therefore, are unlikely to present a risk to site users. However, the average (US₉₅) results for arsenic, sulphate and TPH are above the screening values and therefore may present a risk to operatives.

8.2.4 Maximum Value Test

The maximum value test is used to determine statistically whether or not the highest result in a group represents an outlier (i.e. a localized area of contamination or 'hotspot') or lies within the anticipated range of results for the group.

The maximum value test indicates that the maximum recorded values of nickel, TPH and sulphate can be accepted as part of the range of results for the group and do not represent a hotspot of contamination. Conversely, the test indicates that the maximum recorded values of arsenic, copper, sulphide, TEM and PAH may be treated as outliers or hotspots of contamination.

8.3 Assessment of Groundwater Contamination

8.3.1 General

Four groundwater samples were taken from standpipe piezometer nos. 4A, 5, 17 and 18, and analysed by DETS for a range of contaminants. The test results were compared with published guideline levels as part of a screening assessment. The following guidelines were used:

- (i) Guidelines published by the Dutch government (Dutch Ministry of Housing, 2000) and described in Section 8.1;
- (ii) Water Quality Regulations (1989 & 2000), which provide standards for drinking water and consider a number of contaminants not covered in the Dutch guidelines.

8.3.2 Screening Assessment

The results of the screening assessment are shown in **Table 9**.

Contaminant	Screening Value	Units	Minimum Value	Maximum Value	Number Exceeding Screening Value
Arsenic	0.06	mg/l	<0.001	<0.001	0
Boron	1	mg/l	0.34	0.53	0
Cadmium	0.006	mg/l	<0.002	<0.002	0
Chromium	0.03	mg/l	<0.01	0.01	0
Copper	0.075	mg/l	0.005	0.011	0
Lead	0.075	mg/l	<0.01	0.02	0
Mercury	0.0003	mg/l	<0.0002	<0.0002	0
Nickel	0.075	mg/l	<0.01	0.08	0
Selenium	0.16	mg/l	<0.003	<0.003	0
Zinc	0.8	mg/l	0.09	0.48	0
Acidity/alkalinity	-		5.9	8.5	0
Sulphate	250	mg/l	252	5280	3
Sulphide	250	mg/l	0.81	<0.5	0
Total Cyanide	1.5	mg/l	<0.02	<0.02	0
TPH (total)	1	mg/l	1.1	6.6	4
Phenol (total)	2	mg/l	<0.0005	<0.0005	0
PAH (total)	0.08	mg/l	0.0004	0.0073	0

Table 9 Summary of Contamination Levels for Groundwater Samples

The screening assessment shows that there is little contamination in the groundwater. There are no significant concentrations of heavy metals, but hydrocarbon and sulphate levels are elevated in all of the samples taken.

8.3.3 Leachate Test Results

Leachate tests were carried out on 13 soil samples with elevated levels of nickel, copper and/or arsenic. The samples were tested to assess the potential for contaminant mobility. Of the samples tested, seven were analysed for arsenic, five for nickel and one for copper. The results were compared with the screening values used in Section 8.3.2 and are presented in **Table 10**.

Contaminant	Screening Value	Units	Minimum Value	Maximum Value	Number Exceeding Screening Value
Arsenic	0.06	mg/l	<0.001	<0.001	0
Nickel	0.075	mg/l	<0.01	0.17	1
Copper	0.075	mg/l	-	0.15	1

Table 10 Leachate Test Results

The results show that the majority of the contaminants are not soluble and therefore do not pose a risk to groundwater. However one sample with a low pH has a relatively high concentration of leachable nickel, whilst another has a relatively high concentration of leachable copper.

8.4 Summary

Sulphate concentrations that exceed the screening values were encountered across the Site in both the soil and the groundwater. This is to be expected where colliery spoil is present.

Three soil samples recorded elevated nickel concentrations and one recorded elevated copper. These samples were located in the north-eastern part of the Site. Elevated arsenic levels were distributed over the majority of the Site, but were not encountered in the north-west.

The investigation also highlighted isolated areas with particularly acidic soils which would facilitate the mobilisation of heavy metals. Leachate tests were carried out on a number of samples with elevated metal concentrations and, not unsurprisingly, it was found that by far the greatest proportions were insoluble. However, soluble nickel and copper were recorded from isolated hotspots (trial pit nos. 17 and 21, and borehole no. 17).

Elevated concentrations of TEM and PAH were encountered in the north-east corner of the Site in the area formerly occupied by the Colliery. Particular attention is drawn to trial pit nos. TP18, TP20, TP21 and TP29 and borehole no. 18, and to borehole no. 20 in the north. Those samples which encountered elevated TEM concentrations were re-analysed for speciated TPH. This showed the presence of mineral range organics.

All of the groundwater samples recorded elevated concentrations of TPH demonstrating the mobility of some of the hydrocarbon contamination.

The results show that the former site of the Colliery and the coke works represents the source of the majority of the contamination. Any future reclamation of the Site should aim to remove isolated pockets of hydrocarbons to either a suitably licensed landfill site or to a purpose built repository located on the Site. UK Coal has established a number of precedents when seeking authorisation for the construction and future monitoring of contaminant repositories at their former Ferrymoor site in South Yorkshire. It is suggested that a similar approach could be adopted at North Gawber. Alternately, it may be possible partly or wholly treat the materials by ex-situ bioremediation prior to their disposal under less restricted circumstances.

9. RISK ASSESSMENT AND CONCEPTUAL MODEL

9.1 General

An assessment has been carried out to determine the risk to both human and environmental receptors posed by the Site in its current and proposed future condition. The assessment presents risks based on the data presented in this Report.

9.2 Concept

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

9.3 Potential Contaminants - Source

Any contamination found in excess of the screening values is considered to be a source. Based on the work described in this Report, the following sources are evident:

- (i) elevated levels of arsenic, copper, nickel, sulphide, sulphate and TEM, principally in the deposits of made ground;
- (ii) elevated levels of hydrocarbon contamination in the vicinity of the former colliery and coke works. Hydrocarbon contamination is also recorded in the groundwater

It should be noted that despite a relative comprehensive intrusive investigation, additional sources of contamination may come to light during the development of the Site. The presence of underground structures (e.g. old storage tanks) cannot be discounted and these could contain materials of a potentially harmful nature.

9.4 Receptors

A receptor is a potential recipient of the pollution, to which significant harm or deterioration in quality may be caused. The receptors under consideration include:

- (i) human site users;
- (ii) surface watercourses;
- (iii) groundwater resources;
- (iv) site vegetation;
- (v) adjacent properties;
- (vi) new buildings on the Site.

9.5 Migration Pathways

Migration pathways are routes along which contamination may move towards the target. The pathways of exposure for human targets include dermal contact, ingestion and inhalation. The pathways of exposure for the surface watercourses are surface runoff and lateral migration of contamination through permeable strata. The pathway for exposure for plants is by direct contact between the roots and phytotoxic contaminants dissolved in the soil or water. The pathways for exposure for adjacent properties are either from direct surface runoff carrying contaminants in suspension or solution, or by downward seepage or lateral movement of polluted or leaching groundwaters.

The principal pathways by which targets on a site might become exposed to contamination include direct human contact with contaminated soil or water, surface runoff, migration of contamination through permeable strata, plant uptake and contact of buried sub-structures with contaminated soil or groundwater.

9.6 Risk Assessment – Pollutant Linkages

Risk can be defined as the combination of the consequences of a harmful effect and the probability of its occurrence. For each pollutant linkage identified, both these factors are considered to determine whether there may be an unacceptable risk. The risk has been classified into the following categories:

- (i) low – no action likely to be required;
- (ii) medium – some mitigation may be required;
- (iii) high – action will definitely be required.

Tables 11 to 13 summarize the pollutant linkages that might exist on the Site. The assessment assumes that the Site will eventually be redeveloped for housing with private gardens. However, the assessment also considers the remediation proposals.

Receptor	Pathway(s)	Source	Linkage?	Risk and Comment
Adjacent properties	Permeable strata and surface runoff.	Contamination in made ground.	Yes – groundwater levels are high in some parts of the Site and surface water runoff is extensive due to the lack of vegetative cover.	Low to medium – contaminants could be transported, although few are soluble.
Site users and general public	Direct contact: ingestion, inhalation and dermal contact.	Contamination in made ground.	Yes – possible direct contact with the soil.	Low to medium – the site is sparsely vegetated, but contamination is not present in large concentrations.
Site vegetation	Plant uptake.	Contamination in made ground	Yes.	Medium – most contaminants are insoluble and not phytotoxic. Soluble copper and nickel are phytotoxic, but are present in small quantities.
Surface watercourses	Migration of contamination in surface runoff or through permeable strata.	Hydrocarbon and soluble heavy metals in made ground.	Yes – mobile groundwater in the made ground may lead to transport of soluble or miscible contaminants from isolated hotspots.	Medium - no contamination is evident in the watercourses at present. However, contaminated groundwater lies at shallow depth. Some of the recorded water levels lie above that of the stream.
Groundwater	Migration of contaminants through permeable strata.	Hydrocarbon and soluble heavy metals in made ground.	Yes – mobile groundwater in permeable made ground.	Low – the site is underlain by Coal Measures with various worked horizons and the groundwater is likely to be significantly contaminated below the Site.

Table 11 Environmental Risk Assessment of Source-Pathway-Receptor Linkages for Current Site Conditions

Receptor	Pathway(s)	Source	Linkage?	Risk and Comment
Site workers	Direct contact: ingestion, inhalation and dermal contact.	Contamination in made ground.	Yes – site workers in close contact with soil.	Medium to low – contaminated soil will be exposed during construction works, isolated hotspots of soluble materials will be dispersed during remediation.
Site vegetation	Direct contact: uptake of dissolved contaminants.	Contamination in made ground.	Yes - possible direct contact with contaminated soil.	Medium – contaminated soils likely to be disturbed may affect vegetation. Vegetative cover is poor and will be removed during remediation.
General public and residents	Direct contact: ingestion, inhalation and dermal contact.	Contamination in made ground.	Yes - possible direct contact with contaminated soil.	Medium – small areas of contaminated soil may be exposed during construction works. However, access to areas undergoing remediation will be restricted to site operatives only.
Surface watercourses	Migration of contamination in surface runoff or through permeable strata.	Contamination in made ground.	Yes – mobile groundwater within permeable ground.	Medium – disturbance of soils likely to increase mobility of contaminants.
Groundwater	Migration of contaminants through permeable strata	Contamination in made ground.	Yes – mobile groundwater within permeable ground.	Medium - disturbance of soils likely to increase movement of contaminants, but this is unlikely to pose a significant risk to groundwater.

Table 12 Environmental Risk Assessment of Source-Pathway-Receptor Linkages during Remediation and Redevelopment

(Note. Current risks are usually intensified during redevelopment because disturbance of the ground increases the mobility of contaminants.)

Receptor	Pathway(s)	Source	Linkage?	Risk and Comment
General public and residents	Direct contact: ingestion, inhalation and dermal contact.	Contamination in made ground.	No – hard standing, black top and a clean cover of topsoil will prevent contact.	Low – contaminated soil will be inaccessible to the general public provided a clean cover of topsoil is provided in all areas not developed for foundations, hardstanding and black top.
Site vegetation	Direct contact: uptake of dissolved contaminants.	Contamination in made ground.	Yes, but unlikely– deep roots may make contact with soluble contaminants.	Low – contaminated soils unlikely to affect vegetation provided ground levels are raised or drainage improved in saturated areas.
Concrete foundations	Concrete attack by soluble contaminants in mobile groundwater.	Contamination in made ground.	Yes.	Low – provided appropriate concrete design is used.
Surface watercourses	Migration of contamination in surface runoff or through permeable strata.	Contamination in made ground.	Yes, but unlikely – mobile groundwater lies within permeable ground although hard standing, black top and a clean cover of topsoil will prevent contaminated surface run-off.	Low– provided the Site has a clean cover of topsoil in those areas not used for foundations, hard standing and black top, and with appropriate drainage in the southern part of the Site.
Groundwater	Migration of contamination through permeable strata	Contamination in made ground.	Yes – mobile groundwater within permeable ground.	Medium - disturbance of soils likely to increase movement of contaminants, although this is not a significant threat to groundwater.

Table 13 Environmental Risk Assessment of Source-Pathway-Receptor Linkages for Conditions after Redevelopment

10. DEVELOPMENT PROPOSALS AND SITE REMEDIATION

10.1 General

It is assumed that the proposed development will comprise limited surface mining followed by the construction of housing, with associated garages, drives, and front and rear gardens. It is also assumed that some areas will be left as open space with public access.

10.2 Summary of Ground Conditions

The ground conditions at the Site are reviewed in Section 7. They have been determined using the sources of information listed in Section 2 and the intrusive investigations described in Section 6. They can be summarized as follows:

- (i) a continuous cover of made ground, principally comprising coarse colliery discard and ranging in thickness from 0.6 to 13.8m;
- (ii) an underlying, but discontinuous deposit of glacial ‘boulder clay’ or till (0.00 to 2.5m in thickness);
- (iii) bedrock strata comprising a succession of mudstones, siltstones, sandstones, coal seams and seatearths, variously weathered towards rockhead.

10.3 Treatment of Contaminated Materials

10.3.1 General

The intrusive investigation and assessment has indicated that the area of the former North Gawber Colliery and coke works is the source of the majority of the contamination on the Site. There are localized hotspots of phytotoxic copper and nickel, and hydrocarbon contamination.

The intrusive investigation has also indicated that a small amount of hydrocarbon contamination may be encountered in the north-eastern part of the proposed surface excavations, although it will again be localized. Soluble concentrations of nickel were also proved.

It is recommended that the hydrocarbons are removed to a suitably licensed landfill site or a purpose built repository on the Site. Alternately, it might be possible to carry out ex-situ bioremediation prior to their on-Site disposal.

Elevated levels of arsenic have been encountered across the Site. However, the leachate tests have indicated that it is largely insoluble and should not pose a risk to Site operatives or end users. However, the risk can be further reduced by providing clean cover (imported topsoil) in areas intended for use as gardens or open spaces with public access. The thickness of cover can be assessed using the guidelines provided by the Building Research Establishment (BRE) and published in 2004.

Groundwater encountered within the proposed excavations may be contaminated with hydrocarbon and skin contact should be avoided. However, it is possible that there will be sufficient dilution with surface water during the operation of the Site and specific treatment may not be required. Removal of the hydrocarbon hot spots in the made ground should assist in its long term remediation.

Attention is drawn to the elevated sulphate concentrations and low pH values that are present in the colliery spoil. Buried concrete structures will have to be designed to resist sulphate and acid attack, and attention is drawn to BRE Special Digest No. 1 (2001).

10.3.2 Location and Quantification of Contaminants

The location of the various contaminants is shown in **Figure 6** and the areas affected by, for example, hydrocarbons can be clearly identified.

A rough estimate has been made of the volume of hydrocarbon contaminated soils that will require excavation. This estimate attempts to provide a pessimistic or conservative figure by taking account of the likely over-excavation and the inclusion of uncontaminated materials. Experience has shown that unless suitable plant is deployed and the works closely supervised by a qualified technician or engineer, large scale earthworks can effectively double the volume of material removed for treatment and/or disposal. It is therefore strongly recommended that specific plant, other than that required for any surface mining, is deployed for the removal of contaminated soils. Additional testing and monitoring will be required at the time of the excavations to determine that all the contaminants have been removed. This should form part of the Site supervision.

For the purposes of planning future site operations, providing preliminary designs for a repository and estimating the cost of any off-Site disposal or treatment, it is suggested that a volume of 28,000m³ is used for the hydrocarbon contaminated soils. Hopefully, this will prove to be overly conservative. Additional, but minor excavations might be required to remove two areas of elevated nickel concentrations also located in the north-eastern part of the Site. This may depend upon further discussions with the Environment Agency, but the material could be safely deposited on Site either diluted by other colliery spoil materials from which the contaminant is most definitely sourced or within a purpose built cell.

10.4 Stabilisation of Shallow Old Workings and Recovery of Incidental Coal

UK Coal proposes to carry out limited surface excavations on the Site along the outcrop of the Kent's Thick (AZ) seam. This will achieve two objectives:

- (i) the recovery of valuable mineral;
- (ii) the removal of old workings voids and stabilisation of the ground in that area.

Item (ii) could represent a significant 'planning gain' such that UK Coal's proposed development could be viewed as stabilisation works rather than mineral extraction. Coal recovery would be incidental if it facilitated building development and could appreciate the value of the land, subject to planning permission. Should this prove to be an acceptable proposal, then it is recommended that the excavations are extended such that the ratio of bedrock cover to extracted coal thickness is at least 10:1 where possible. This is in accordance with the advice provided in CIRIA (1984) and is a general requirement of the NHBC if they underwrite the development.

Where the ratio of rock overburden to extracted void exceeds 10:1, then conventional residential development can generally proceed without further treatment of old workings. In areas where old workings cannot be removed by excavation and the depth of cover is insufficient, then it is usual practice to grout the voids prior to building construction. This is a relatively expensive process and one which ordinarily requires close supervision to ensure satisfactory completion.

Any surface excavations to remove old workings voids would have to be backfilled in a controlled manner such that the materials are properly compacted. If the area is developed for residential properties, experience suggests that the NHBC or some other 'underwriter' would insist upon a detailed compaction specification (i.e. one that entails close supervision, in-situ testing and certification). The compaction properties of the fill materials would have to be assessed by bulk sampling and laboratory testing. Compaction trials would also have to be undertaken with in-situ nuclear density and sand replacement tests to determine the worthiness of the compaction methodology. This would be based on the Highways Agency Series 600 Earthworks Specification (1998).

Satisfactory compaction of the backfill would enable building construction to take place within the excavation areas using suitably designed raft foundations. Experience again suggests that this is a necessary pre-requisite for the NHBC. Piles would be required where it was intended to 'bridge' areas extending across the excavation highwalls.

The 1/1000 scale cross section provided by UK Coal suggests that there is sufficient rock cover above the Barnsley (AVX) seam across the whole Site area. However, this should be checked by UK Coal and any other developer as part of a broader geotechnical assessment for building construction.

10.5 Treatment of Mine Openings

Early editions of the OS plans (Section 3) and the Coal Authority Mining Report (**Appendix D**) indicate that a number of mine openings are present on the Site. These have been backfilled, but it is not known if any other treatment has been undertaken. The fact that significant settlement should occur in one of the backfilled shafts during SDA's intrusive investigation suggests that at least some of the mine openings have not been capped or sealed.

At the time of compiling this Report, it is understood that the Coal Authority still has responsibility for the security of the mine openings, but this may change if UK Coal undertake surface mining and/or the land is sold for building development. Where the structures cannot be completely removed by excavation, they will have to be treated in accordance with a specification agreed with the Coal Authority, generally in accordance with the recommendations given in NCB (1982). Experience suggests that the NHBC will not permit building development above mine openings, even if they have been properly treated.

10.6 Compaction of Made Ground

No geotechnical laboratory or in-situ testing was carried out at North Gawber Site on the instructions of the client. It is strongly recommended that a comprehensive geotechnical investigation is carried out at the Site prior to development.

Before the Aberfan disaster in 1969, the colliery spoil on the Site would have been loosely tipped and no specific compaction would have been carried out. After this time, colliery tips were constructed in layers according to an approved methodology and in accordance with a specific design. Nevertheless, it is expected that some self-weight compaction will have occurred in the older deposits of spoil. Some of this material also appears to have been re-distributed during the development of North Gawber Colliery. This might have entailed layered deposition and significant trafficking, thereby increasing the level of compaction.

In order to facilitate building construction, the made ground will have to properly compacted where its thickness precludes the use of trench or strip footings extended into the underlying glacial till or bedrock. Indeed, the suitability of the glacial till as a foundation will have to be assessed as part of a recommended geotechnical investigation. Alternately, piled foundations could be used with the piles extended beyond the upper weathered horizons of the bedrock.

The made ground can be compacted by excavation followed by systematic layering and rolling in accordance with an approved specification. The NHBC will probably insist on a detailed specification with in-situ testing. Alternately, it may be possible to use a rapid impact compactor or conventional dynamic compaction equipment dependent upon its thickness. However, vibration and noise levels will have to be carefully considered because of the close proximity of occupied dwellings.

Taylor (1984) provides some information as to the likely geotechnical properties of the colliery spoil at the Site including their compaction characteristics (Tables 14 and 15). This predominantly comprises unburnt coarse discard, which is produced by mining, excavating and coal washing. However, fine discard, which is solely a product of coal processing and consists of dewatered slurry or tailings, was found in the northern part of the Site. Burnt discards were also encountered.

Type of Discard	Natural Moisture Content (%)			Liquid Limit (%)			Plastic Limit (%)			Bulk Density (Mg/m ³)		
	No.	Mean or Median	Std. Dev.	No.	Mean or Median	Std. Dev.	No.	Mean or Median	Std. Dev.	No.	Mean or Median	Std. Dev.
Unburnt Coarse Discard	1267*	11.0 (12.0)	(6.0)	720	36.8	6.92	720*	21.0 (21.4)	(4.0)	1102*	1.902 (1.863)	(0.219)
Burnt Coarse Discard	13*	13.5 (14.5)	(5.04)	9	36.3	4.47	9*	23.0 (22.7)	(2.3)	11*	1.973 (1.919)	(0.198)
Unburnt Fine Discard	390	34.8	12.9	373*	38.0 (38.8)	(7.63)	352*	15.7	5.7	321*	1.457 (1.492)	(0.233)

* Skew distribution.

Means and standard deviations are shown in parenthesis when the median is the appropriate measure of central tendency.

Table 14 Classification Test Results for UK Coarse and Fine Colliery Discards (Taylor (1984))

Type of Discard	Compaction Test Method	No. of Tests	Optimum Moisture Content (%)		Maximum Dry Density (Mg/m ³)	
			Mean	Standard Deviation	Mean	Standard Deviation
Unburnt Coarse Discard (all UK)	2.5kg	132	13.2	4.22	1.74	0.16
	4.5kg	93	10.1	3.20	1.81	0.16
	Vibrating Hammer	138	11.7	3.90	1.79	0.16
Burnt Coarse Discard (all UK)	2.5kg	51	16.7	3.99	1.77	0.12
	4.5kg	3	14.6	3.38	1.86	0.12
	Vibrating Hammer	25	15.0	3.00	1.88	0.12

Table 15 Summary of Compaction Test Results from Taylor (1984)

Although burnt discard materials are present on the Site, there was no evidence of active combustion during the intrusive investigation. However, the combustion potential should be assessed prior to any building development. Systematic compaction is recognised as a means of eliminating the risk (NCB, 1973).

10.7 Excavation Slopes

UK Coal currently proposes to excavate at least part of the Site to depths that extend from 6 to 22m below ground level. The stability of the excavation slopes will have to be assessed for reasons of health and safety, and in the absence of any site specific testing it may prove necessary to use assumed shear strength parameters.

Taylor (1984) analysed the results of 1,162 effective peak shear strength tests for unburnt coarse colliery discard using p' - q' plots. A 'best fit' power curve corresponding to $c' = 0$ kN/m^2 and $\phi' = 33.4^\circ$ was derived, although the ϕ' value reduces to 32° at higher values of p' (generally >500 kN/m^2). The test results for burnt discard, 96 in total, show a much greater spread reflecting the varying degrees of combustion. Linear regression of the triaxial and shear box test results for fine discards provided a ϕ' value of 34.5° ($c' = 0$ kN/m^2). Upper and lower limits equivalent to ϕ' values of about 21 and 50° were also found.

11. SUMMARY OF MAIN POINTS

1. The examination of various sources of archive information has identified a number of potential sources of contamination on the Site and other factors that will have a bearing on its development. These include:
 - (i) the presence of significant quantities of made ground (colliery spoil);
 - (ii) the location of a former coke works facility;
 - (iii) the site of a former colliery;
 - (iv) a number of disused mine openings;
 - (v) the presence of shallow old workings in the Kent's Thick (AZ) seam, which 'outcrops' on the Site (i.e. subcrops beneath the superficial deposits);
 - (vi) the BGS's recommendation that basic protection measures will be required to protect any housing development from radon gas;
 - (vii) the possible migration or previous importation of contaminants from external sources.
2. *At least some of the colliery spoil will have been loosely tipped and although earthworks have been carried out on the Site as part of its historic development possibly entailing its compaction, it is unlikely to form a suitable foundation for housing development. The ground will therefore have to be improved by compaction or the foundations will have to be designed such that they are located on a suitable substrate.*
3. The former coke works area provides the principal source of contamination, but this is not considered to be particularly significant. Isolated pockets of hydrocarbon contamination are present, but these can be selectively removed to a suitably licensed landfill site or purpose built repository on the Site. Consideration should also be given to ex-situ bioremediation prior to on-Site disposal.
4. The colliery spoil has been weathered and shows typical chemical characteristics. Elevated arsenic and sulphate concentrations have been found. The latter will have a bearing on the design of buried concrete structures. The arsenic is largely insoluble and unlikely to pose a risk to operatives and end-users. Elevated nickel and copper concentrations will give rise to phytotoxicity, but are unlikely to pose a risk to human health. However, potentially soluble proportions of nickel and copper have been identified.
5. The site of the former North Gawber Colliery may represent a source of some of the hydrocarbon contamination (e.g. mineral range organics from fuel and lubricating oils).
6. There is no evidence to suggest the migration of contaminants onto the Site from external sources. This includes various landfill sites. It is entirely possible that contaminated materials were imported onto the Site during its long history of development. However, none have been identified during the intrusive investigation.

7. Additional gas monitoring will be required on the Site to further assess the risks posed by carbon dioxide concentrations that presently exceed 1.5% by volume in the made ground. The risks posed by mine gas (stytthe) should also be properly assessed. The BGS recommend that measures should be taken to protect properties on the Site from radon. The incorporation of suitable membranes into the floor slabs and cavity walls of the individual properties could provide the protection required for all of these gases.
8. Perched groundwater is present in the made ground and is supported by the underlying deposits of glacial till, where present, and weathered bedrock. The groundwater has been shown to be contaminated with hydrocarbons and sulphates. Removal of the hydrocarbon contamination in the made ground will assist in the remediation of the groundwater, but the elevated sulphate concentrations are a characteristic of colliery spoil tips.
9. The level of the groundwater in the underlying bedrock strata is not known, but is still likely to be drawn down despite large scale recovery following the closure of various collieries in the Barnsley area. This groundwater will have elevated sulphate concentrations due to the presence of old workings.
10. A number of disused mine openings are present on the Site. These have been backfilled but may not be properly sealed. Suitable treatment works will be required prior to development.
11. The shallow old workings in the Kent's Thick (AZ) seam will have to be treated to facilitate building development. This could entail their excavation to a depth corresponding to a ratio of at least 10:1 rock overburden to extracted thickness and could represent a significant 'planning gain' for UK Coal. The excavations would have to be backfilled in a controlled manner such that the materials are properly compacted. Alternately, the voids would have to be grouted or a combination of the two treatment methods undertaken.
12. A comprehensive geotechnical investigation of the Site will be required prior to any building development and the stability of any surface excavations properly assessed.

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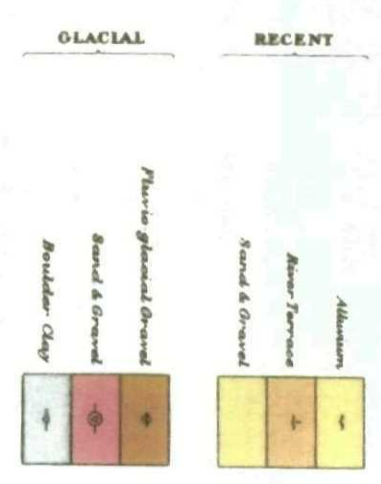
The Water Supply (Water Quality) Regulations (2000). HMSO, London

FIGURES

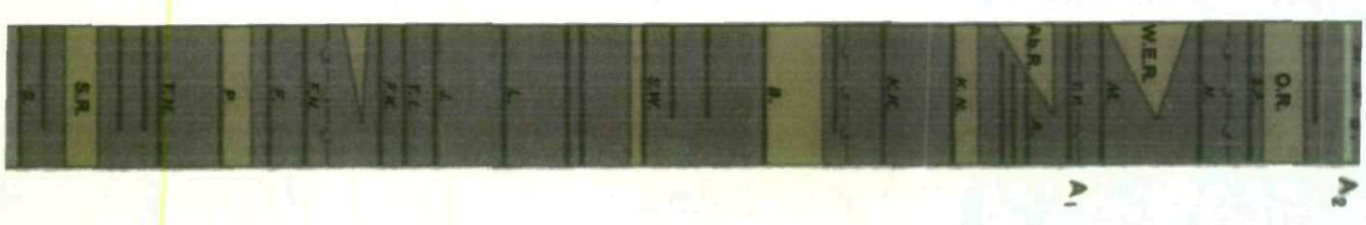
				Drawing Title LOCATION PLAN FIGURE 1		 SCOTT DOHERTY associates
Project NORTH GAWBER COLLIERY REMEDIATION AND REDEVELOPMENT SCHEME GEO-ENVIRONMENTAL ASSESSMENT REPORT				Drawing no. SDA/04014/01		
				Scale 1 : 50,000		
				Status FINAL		
Drawn	Date	Checked	Passed	Deworthside Business Centre Consett Business Park Consett, Co. Durham DH9 6BP		Geotechnical Engineers Environmental Consultants Hydrogeologists Mineral Surveyors
PD	JAN 05	SD	DAB			



EXPLANATION of Geological Signs Colours and Abbreviations



- Dip of strata, the angle in degrees.
 Dip proved underground
 Horizontal strata
 Gently inclined strata
 Mine shaft
 Mine shaft abandoned
 Borehole
 Water bore
 Mine shaft
 Mine shaft abandoned
 Landfills
 Faults, shown with on downthrow side
 Coal crops
 Gold lines are Mineral veins
 Geological boundaries (shaded)
 Boundaries, coal crops and faults
 where uncertain, are shown broken.
 Geological boundaries (Dotted)
 Fossil localities
 Mansfield Marine Band
 Marine Bands
 Horizontal Section only
 Carboniferous Bands



MIDDLE COAL MEASURES

- | Abbreviation | Name |
|--------------|------------------------------------|
| Br | Brerley |
| Sh | Shatton |
| Sw | Swinton Pottery |
| N | Newhill |
| M | Woodmoor, Washwood or Nelson Field |
| Tr | Two Foot |
| A | Abdy or Whiner |
| Kt | Ken's Thin |
| Kt | Ken's Thick or Mappleton |
| B | Barnaby |
| Sw | Swallow Wood or Haigh Moor |
| L | Lidgate |
| J | Joan |
| Ti | Tanberley Ironstone |
| Ft | Flockton Thick |
| Ft | Flockton Thin |
| P | Penon |
| P | Parkgate |
| Tr | Thorncliffe Thin |
| S | Silstone |
| W | Whitmoor |
| H | Hard Bed Band |
| H | Garter or Hard Bed |
| M | Day or Middle Band |
| C | Caking or Soft Bed |
| P | Pot Clay |
- Sandstones and Grits**
- | | |
|---|--|
| R | Ravenfield Rock |
| W | Wickertley Rock |
| D | Dalton or Brerley Rock |
| A | Adworth Rock |
| M | Mearnsburgh or Royaton Rock |
| O | Oaks Rock |
| W | Woolley Edge Rock |
| A | Abdy Rock |
| S | Silstone Rock |
| P | Penistone Flags |
| G | Greenside Sandstone |
| G | Greenmoor Rock |
| W | Wharfedale Rock |
| L | Laxley Edge Rock |
| C | Crawshaw Sandstone |
| R | Rough Rock |
| W | Widdersfield White Rock |
| R | Rivelin Grit (Horizontal Section only) |
| G | Millstone Grits |
- Where the Sandstones cover small areas they have been generalized or omitted.





EXTRACT OF KENT'S THICK SEAM
ABANDONMENT PLAN
FIGURE 3

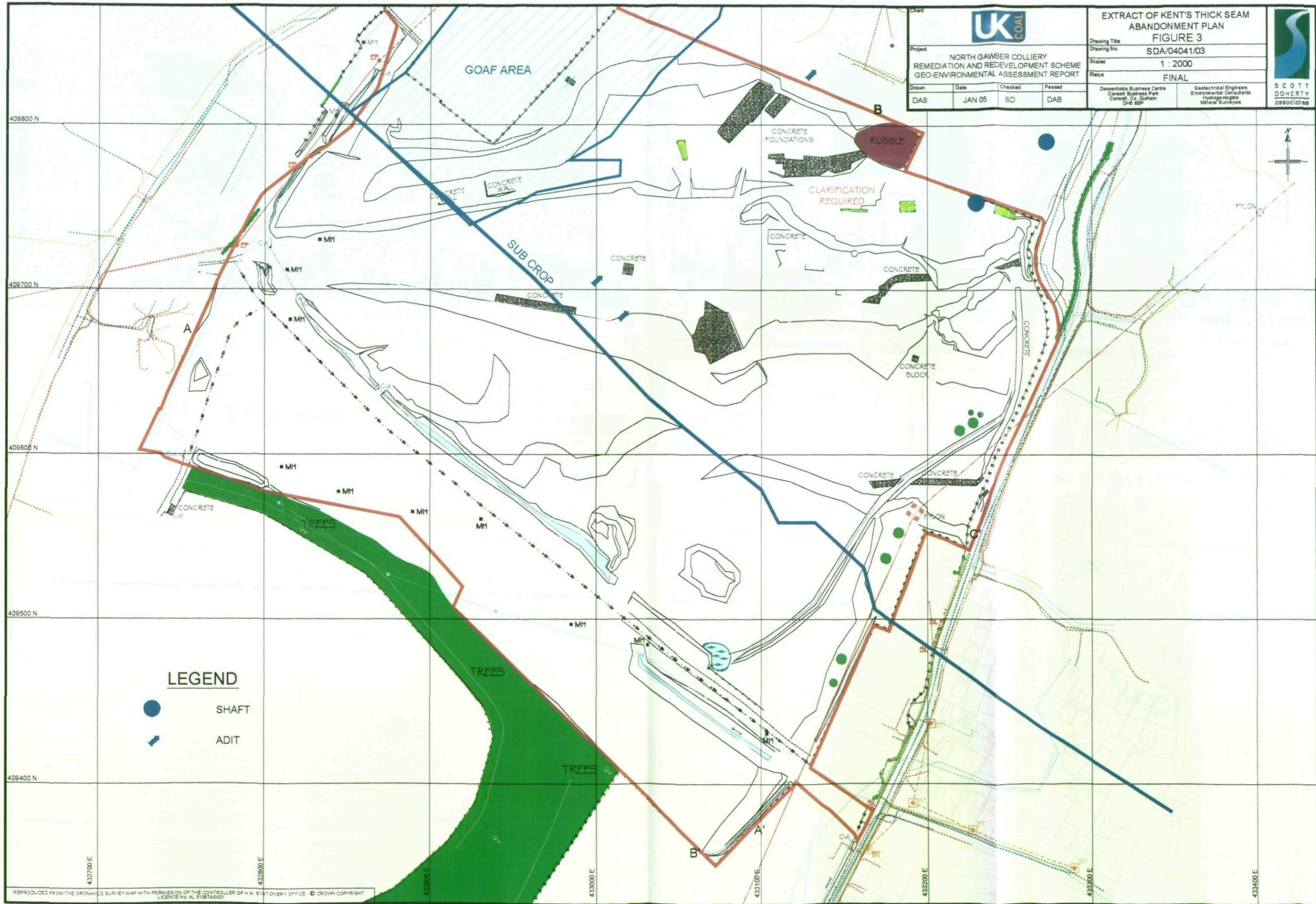
Project
NORTH GAWBER COLLIERY
REMEDATION AND REDEVELOPMENT SCHEME
GEO-ENVIRONMENTAL ASSESSMENT REPORT

Drawing Title
Drawing No. SDA/04041/03
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Status FINAL



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DH6 8BP

Geotechnical Engineers
Environmental Consultants
Hydrogeologists
Mineral Surveyors



LEGEND

-  SHAFT
-  ADIT



Drawing Title
**EXPLORATORY HOLE LOCATION PLAN
FIGURE 4**



Project
**NORTH GAWBER COLLIERY
REMEDATION AND REDEVELOPMENT SCHEME
GEO-ENVIRONMENTAL ASSESSMENT REPORT**

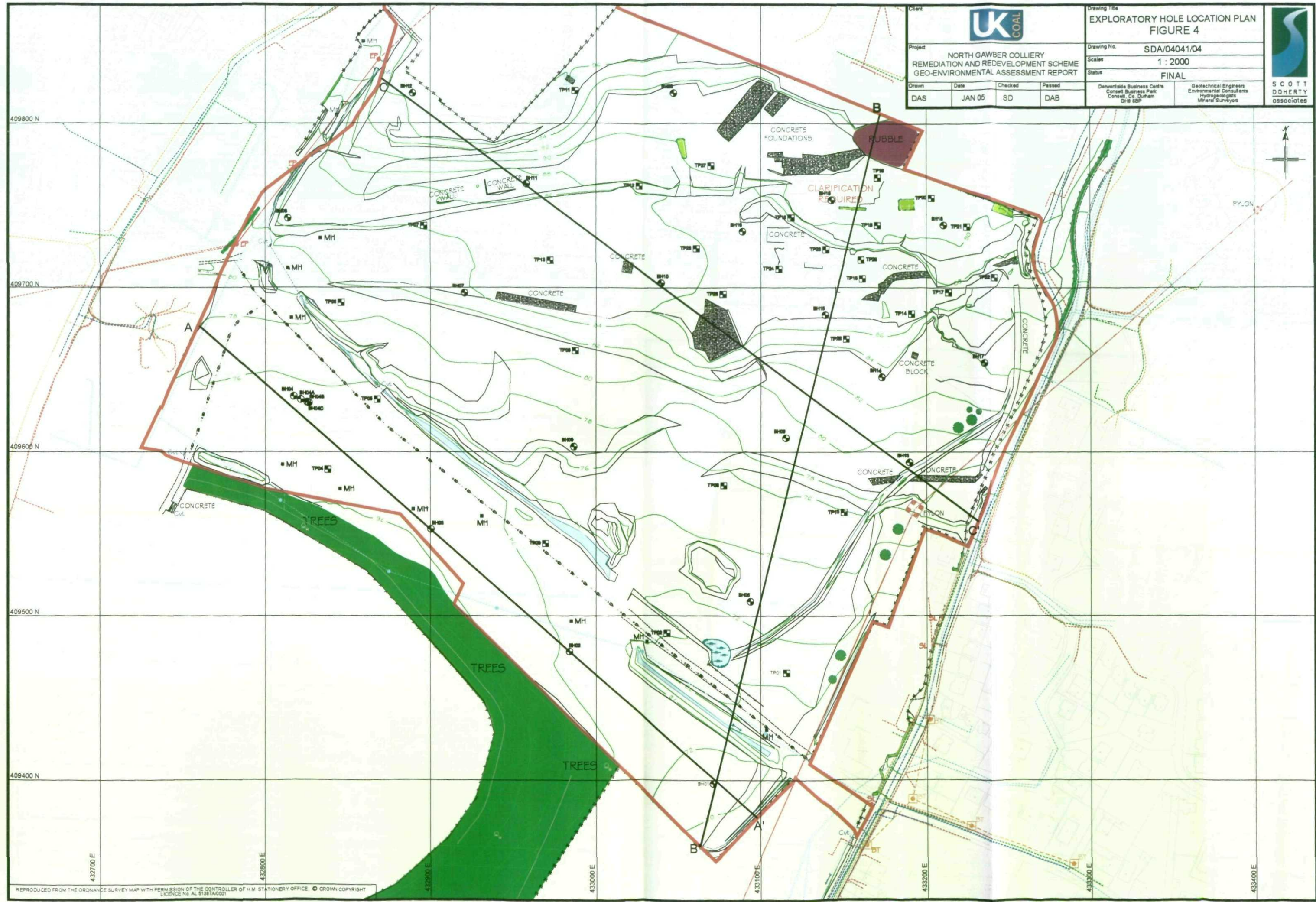
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Environmental Consultants
Hydrogeologists
Mineral Surveyors

**SCOTT
DOHERTY
associates**





LOCATION OF CONTAMINATED SOILS
FIGURE 6

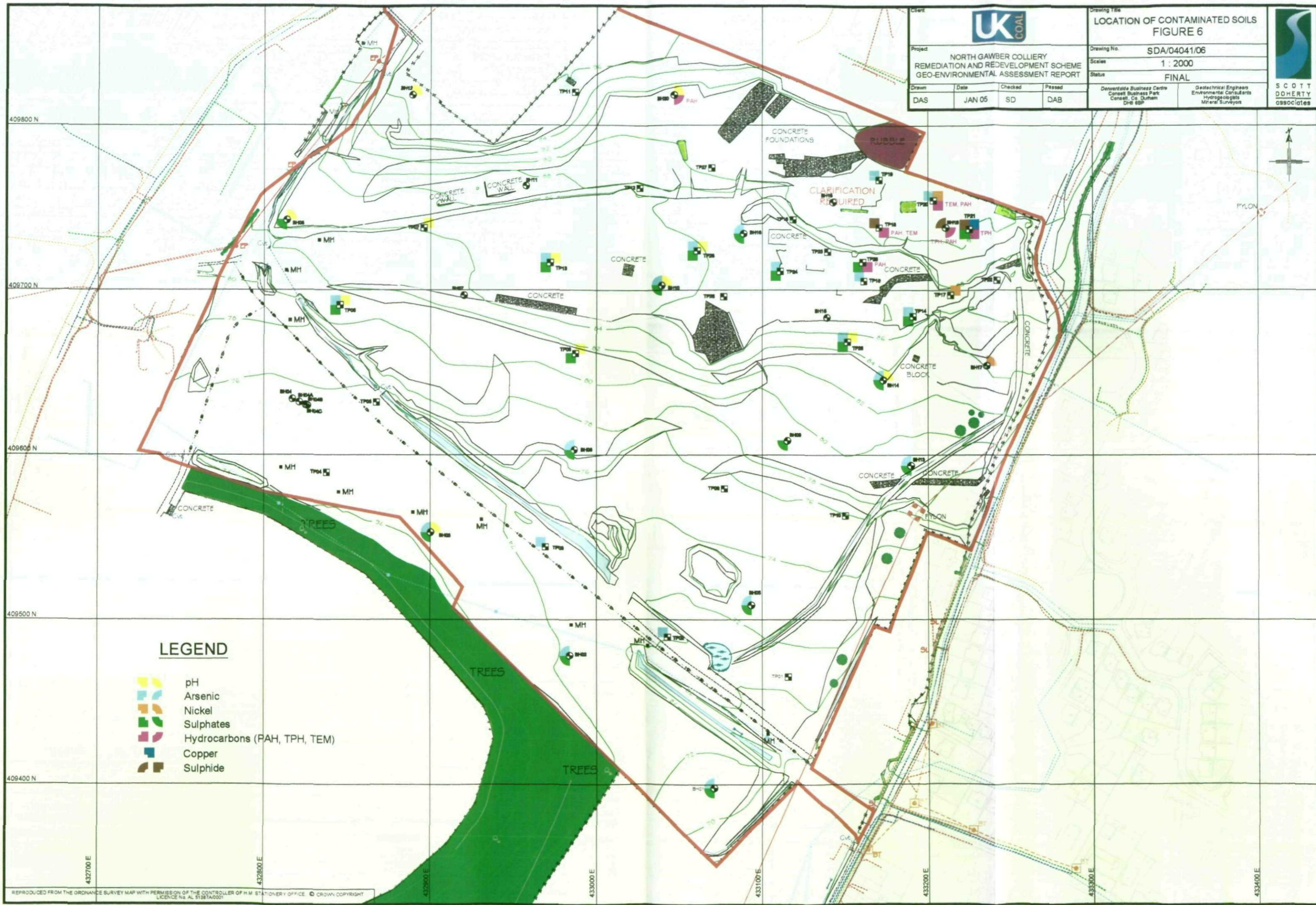
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NORTH GAWBER COLLIERY
REMEDATION AND REDEVELOPMENT SCHEME
GEO-ENVIRONMENTAL ASSESSMENT REPORT

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Environmental Consultants
Hydrogeologists
Mineral Surveyors



LEGEND

-  pH
-  Arsenic
-  Nickel
-  Sulphates
-  Hydrocarbons (PAH, TPH, TEM)
-  Copper
-  Sulphide

APPENDIX A

COPIES OF ORDNANCE SURVEY PLANS

Envirocheck[®] Report:

Historical Map List

Report on:

North Gawber Colliery
Barnsley

National Grid Reference :

433000, 409610

Prepared For :

Scott Doherty Associates
10545
5, Derwentside Business Centre
Consett Business Park
Consett
County Durham DH8 6BP

Your Reference

Mr A Coverdale, SDA/04014

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Ordnance Survey County Series Published 1892 to 1893

County	Mapsheet	Scale	Year
Yorkshire	262_15	1:2,500	1893
Yorkshire	274_03	1:2,500	1892

Ordnance Survey County Series Published 1906

County	Mapsheet	Scale	Year
Yorkshire	262_15	1:2,500	1906
Yorkshire	274_03	1:2,500	1906

Ordnance Survey County Series Published 1918 to 1931

County	Mapsheet	Scale	Year
Yorkshire	262_15	1:2,500	1918
Yorkshire	274_03	1:2,500	1931

Ordnance Survey Plan Published 1962

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE3209	1:2,500	1962
Ordnance Survey Plan	SE3309	1:2,500	1962

Ordnance Survey Plan Published 1974

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE3209	1:2,500	1974
Ordnance Survey Plan	SE3309	1:2,500	1974

Ordnance Survey Plan Published 1977

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE3209NE	1:1,250	1977
Ordnance Survey Plan	SE3309NW	1:1,250	1977

Ordnance Survey County Series Published 1854 to 1855

County	Mapsheet	Scale	Year
Yorkshire	262_00	1:10,560	1854
Yorkshire	274_00	1:10,560	1855

Ordnance Survey County Series Published 1891 to 1894

County	Mapsheet	Scale	Year
Yorkshire	262_SE	1:10,560	1894
Yorkshire	262_SW	1:10,560	1894
Yorkshire	274_NE	1:10,560	1894
Yorkshire	274_NW	1:10,560	1891

Ordnance Survey County Series Published 1907

County	Mapsheet	Scale	Year
Yorkshire	262_SE	1:10,560	1907
Yorkshire	262_SW	1:10,560	1907
Yorkshire	274_NE	1:10,560	1907
Yorkshire	274_NW	1:10,560	1907

Ordnance Survey County Series Published 1938

County	Mapsheet	Scale	Year
Yorkshire	262_SE	1:10,560	1938
Yorkshire	262_SW	1:10,560	1938
Yorkshire	274_NE	1:10,560	1938
Yorkshire	274_NW	1:10,560	1938

Ordnance Survey Plan Published 1956

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30NW	1:10,560	1956
Ordnance Survey Plan	SE31SW	1:10,560	1956

Ordnance Survey Plan Published 1965 to 1966

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30NW	1:10,560	1966
Ordnance Survey Plan	SE31SW	1:10,560	1965

Ordnance Survey Plan Published 1973 to 1980

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30NW	1:10,000	1973
Ordnance Survey Plan	SE31SW	1:10,000	1980

Ordnance Survey Plan Published 1983

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30NW	1:10,000	1983

Ordnance Survey Plan Published 1991 to 1993

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30NW	1:10,000	1993
Ordnance Survey Plan	SE31SW	1:10,000	1991

Ordnance Survey Plan Published 2000

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30NW	1:10,000	2000
Ordnance Survey Plan	SE31SW	1:10,000	2000



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
28-May-2004 10:00
 Customer Ref: Mr A Coverdale, SDA/B4014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 8BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Sunken Road
Marsh	Reeds	Raised Road	
Osiers		Instrumental Contour	
Arrow denotes flow of Water		Sketched Contour	

YORKSHIRE

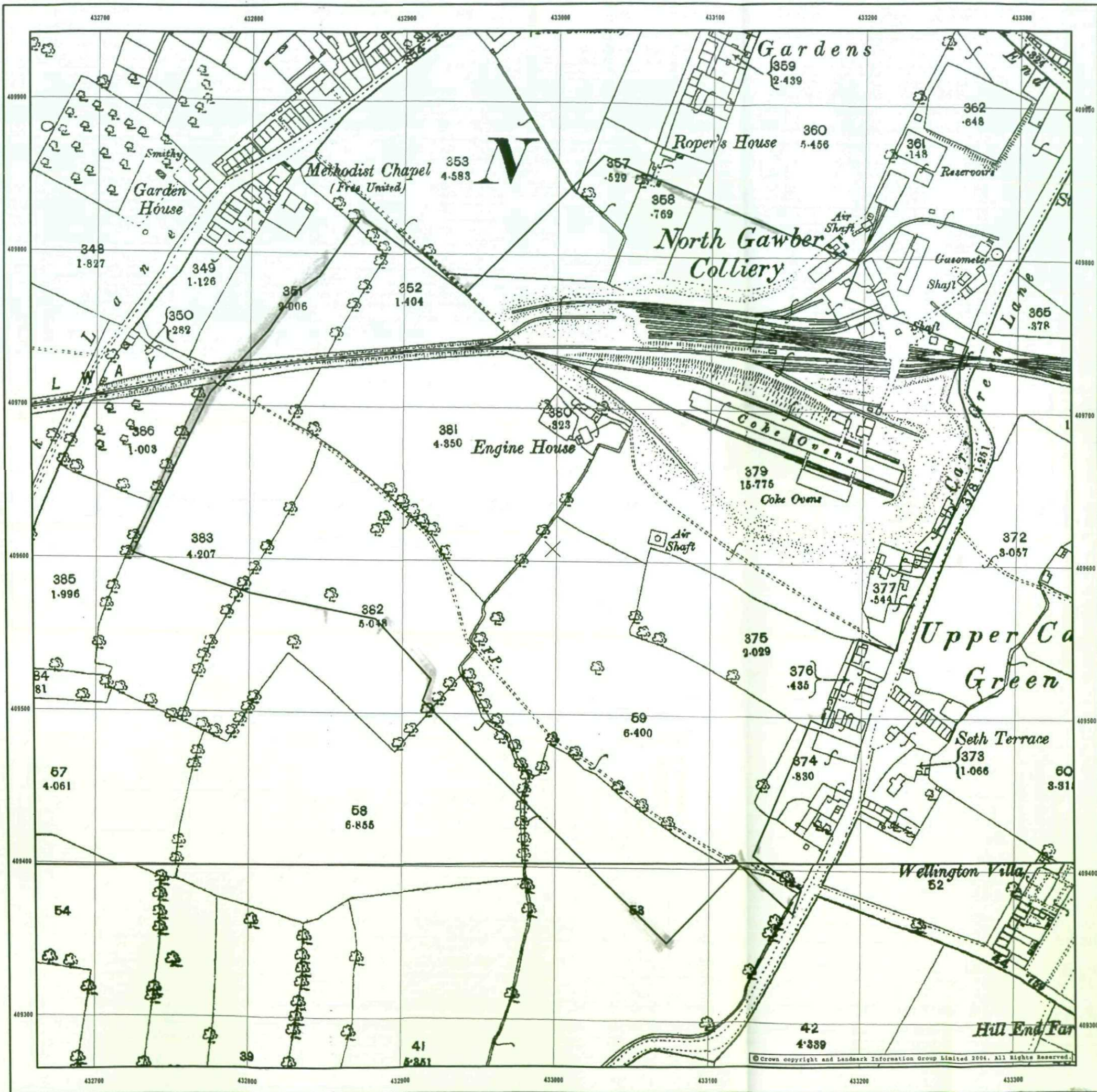
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1970, the first 1:1,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,560

1854
1855

Date(s) of Publication



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(20-May-2004 10:50)

Customer Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610

North Gawber Colliery
 Barnsley

Historical Map Legend

YORKSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published data given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1893
1892

Date(s) of Publication

1 of 10





CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(09-May-2004 10:58)
 Customer Ref: Mr A Coverdale_SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Road over River or Canal
Marsh	Reeds	Sunken Road	Sunken Road
Osiers		Raised Road	Raised Road
Arrow denotes flow of Water	Instrumental Contour		Sketched Contour

YORKSHIRE

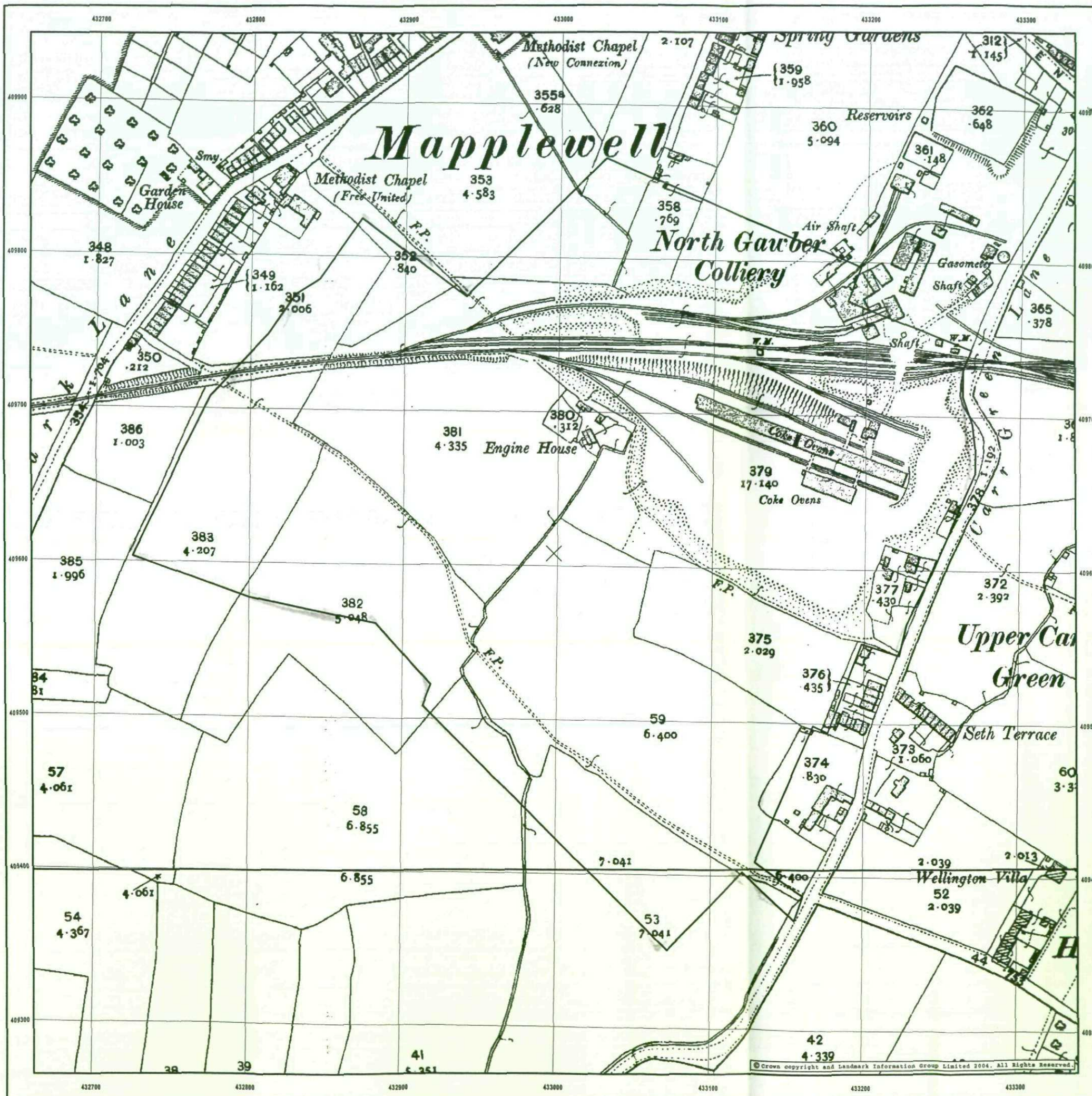
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:10,560 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in adjoining areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfringed - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1976, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,560

1894	1894
1891	1894

Date(s) of Publication



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(25-May-2004 15:30)
 Customer Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

Quarry	Sand Pit	Marsh	Reeds
Gravel Pit	Clay Pit	Rough Pasture	Furze
Refuse Heap	Shingle	Osiers	Ford
Railway crossing River or Canal	Railway crossing Road	Level Crossing	
Embankment	Cutting	Road crossing Railway	
Road over single Stream	Road over River or Canal	Arrow denotes flow of Water	

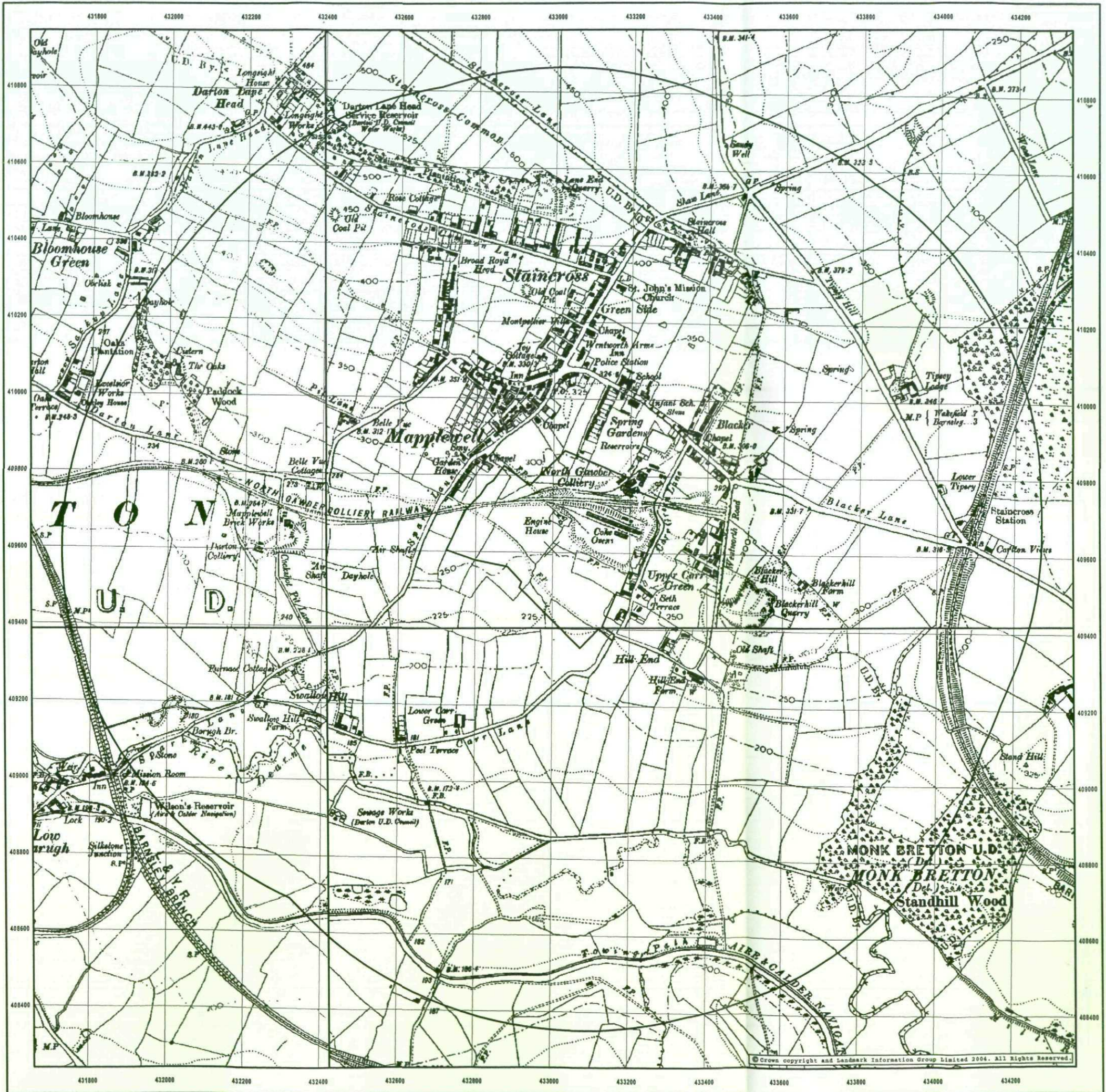
YORKSHIRE
 The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published data given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.
 Source map scale - 1:2,500

1906

1906

Date(s) of Publication

2 of 14



CLIENT DETAILS Envirocheck Order No. **EC3967251_1_1**
(28-May-2004 10:00)

CUSTOMER Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS **Grid Reference** 433000 409610

North Gawber Colliery
 Barrsley

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Sunken Road
Marsh	Reeds	Raised Road	Instrumental Contour
Osiers	Sketched Contour		
Arrow denotes flow of Water			

YORKSHIRE

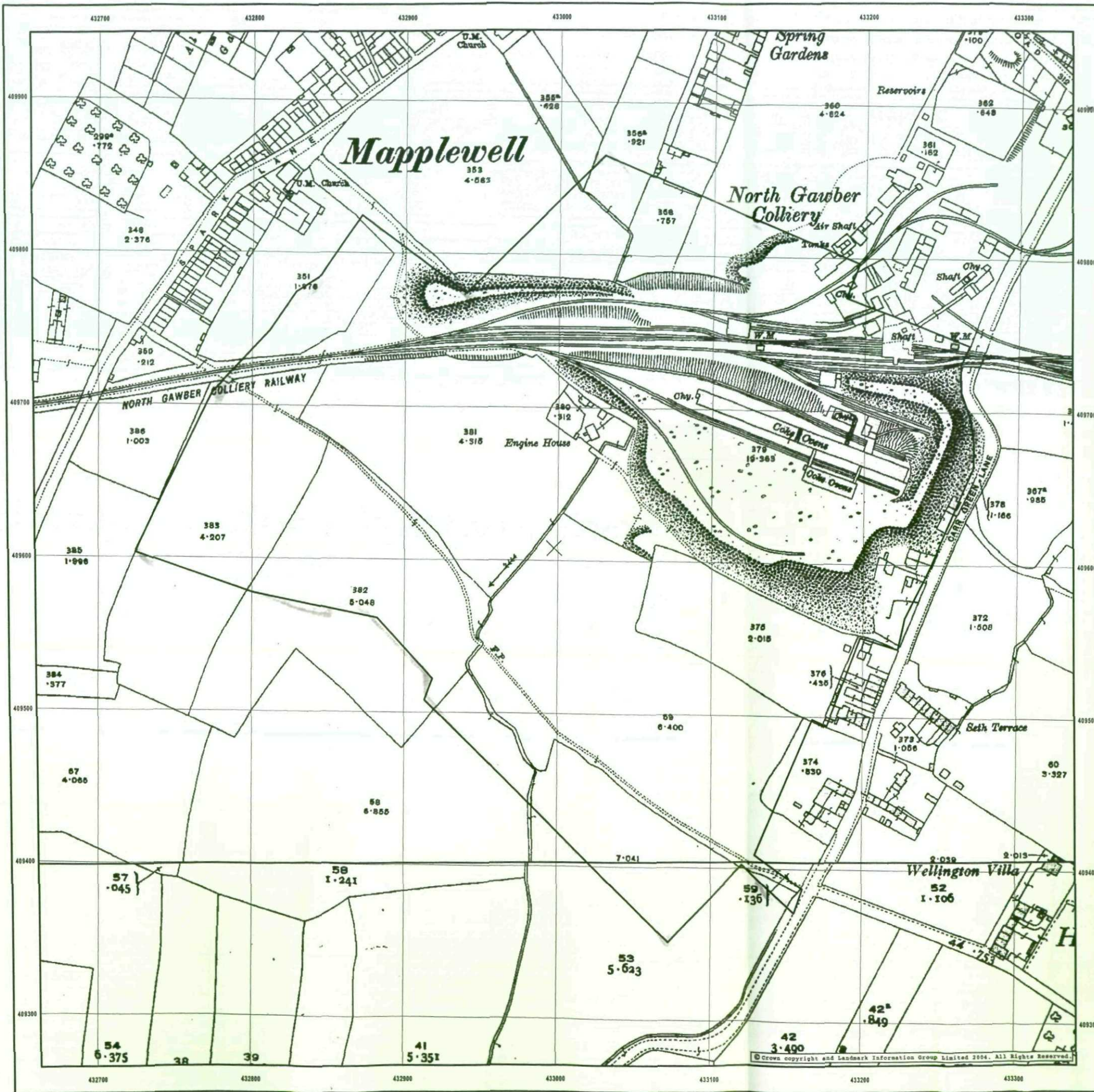
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1970, the first 1:10,560 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,560

1907	1907
1907	1907

Date(s) of Publication



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(28-May-2004 10:55)

Customer Ref: Mr A Coverdale, SDA/04014
Scott Doherty Associates
5, Derwentside Business Centre Consett Business Park
Consett
County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610

North Gawber Colliery
Barnsley

Historical Map Legend

Quarry	Sand Pit	Marsh	Reeds
Gravel Pit	Clay Pit	Rough Pasture	Furze
Refuse Heap	Shingle	Osiers	Ford
Railway crossing River or Canal	Railway crossing Road	Level Crossing	
Embankment	Cutting	Road crossing Railway	
Road over single Stream	Road over River or Canal	Arrow denotes flow of Water	

YORKSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1918
1931

Date(s) of Publication

3 of 18



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
20-May-2004 10:00
 Customer Ref: Mr A Coverdale, BDA/B4014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Sunken Road
Marsh	Reeds	Raised Road	
Osiers	Instrumental Contour		
Arrow denotes flow of Water	Sketched Contour		

YORKSHIRE

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940's. In 1854 the 1:2500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the survey date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1978, the first 1:10,560 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,560

1938	1938
1938	1938

Date(s) of Publication

10 of 10



CLIENT DETAILS Envirocheck Order No. **EC3967251_1_1**
09-May-2004 10:50
 Customer Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference **433000 409610**
 North Gawber Colliery
 Barnsley

Historical Map Legend

	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees		Bracken
	Gravel Pit		Coniferous Trees		Heath
	Sand Pit		Scrub		Rough Grassland
	Disused Pit or Quarry		Lake, Loch or Pond		Reeds
	Refuse or Slag Heap		Pylon		Saltings
	Direction of Flow of Water		Electricity Transmission Line		Marsh
	Cutting		Shingle		Sand
	Road Under		Road Over		Level Crossing
	Foot Bridge		Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge		

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1954 the 1:25,000 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1933, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,560

1956

1956

Date(s) of Publication

11 of 18



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(28-May-2004 10:07)
 Customer Ref: Mr A Coverdale, SDA/94014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 8BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit			Culvert
Slope	Slope			
Pylon	Electricity Transmission Line	Direction of Water flow	Coppice, Osier	
Marsh	Saltings	Orchard Tree	Reeds	
Rough Grassland	Scrub	Henth	Bracken	
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)	Non-coniferous Tree (Not Surveyed)	

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1918, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1962	1962
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Date(s) of Publication

4 of 16



CLIENT DETAILS Envirocheck Order No. **EC3967251_1_1**
(08-000-2004 10-00)
 Customer Ref: Mr A Coverdale, BDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference **433000 409610**
 North Gawber Colliery
 Barmsey

Historical Map Legend

	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees		Bracken
	Gravel Pit		Coniferous Trees		Heath
	Sand Pit		Scrub		Rough Grassland
	Disused Pit or Quarry		Lake, Loch or Pond		Reeds
	Refuse or Slag Heap		Pylon		Saltings
	Direction of Flow of Water		Pole Transmission Line		Marsh
	Shingle		Cutting		Embankment
	Sand		Standard Gauge		Multiple Track
	Road Under		Standard Gauge Single Track		Siding, Tramway or Mineral Line
	Road Over		Level Crossing		Foot Bridge
	Foot Bridge		Narrow Gauge		

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1932, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:25,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,560

1965
1966

Date(s) of Publication

12 of 16



CLIENT DETAILS Envirocheck Order No. **EC3967251_1_1**
(23-May-2004 11:00)
 Customer Ref: Mr A Coverdale, BDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 8BP

SITE DETAILS Grid Reference **433000 409610**
 North Gawber Colliery
 Barmsey

Historical Map Legend

	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees		Bracken
	Gravel Pit		Coniferous Trees		Heath
	Sand Pit		Scrub		Rough Grassland
	Disused Pit or Quarry		Lake, Loch or Pond		Reeds
	Refuse or Slag Heap		Pylon		Electricity Transmission Line
	Direction of Flow of Water		Shingle		Marsh
	Sand		Cutting		Embankment
	Road "T" Under		Road Over		Level Crossing
	Foot Bridge		Standard Gauge		Multiple Track
	Standard Gauge Single Track		Siding, Tramway or Mineral Line		Narrow Gauge

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1954 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,000 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1930, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

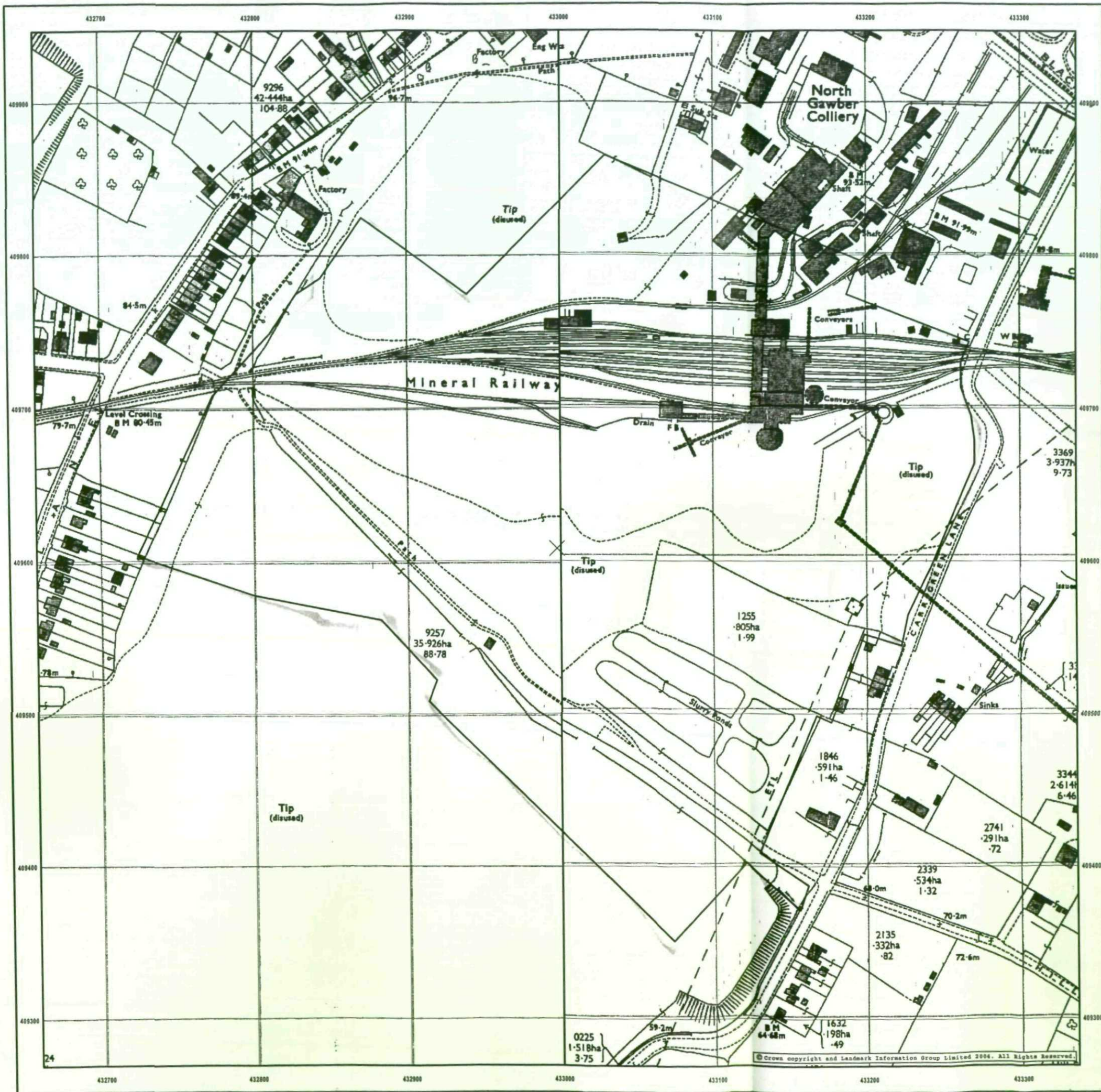
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,000 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,000

1980
1973

Date(s) of Publication

13 of 18



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(28-May-2004 10:07)
 Customer Ref: Mr A Coverdale, BDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit		Culvert
Slope	Slope		
Pylon	Electricity Transmission Line	Direction of Water flow	Coppice, Osier
Marsh	Saltings	Orchard Tree	Reeds
Rough Grassland	Scrub	Heath	Bracken
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)	Non-coniferous Tree (Not Surveyed)

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1884 the 1:2,500 scale was adopted for mapping urban areas and by 1898 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:2,500

1974	1974
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Date(s) of Publication

5 of 14



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(28-May-2004 10:57)
 Customer Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

Inactive Quarry	Chalk Pit or Clay Pit	Active Quarry	Chalk Pit or Clay Pit	Culvert
Slope	Slope	Slope	Slope	Slope
Pylon	Electricity Transmission Line	Direction of Water flow	Coppice, Osier	
Marsh	Saltings	Orchard Tree	Reeds	
Rough Grassland	Scrub	Heath	Bracken	
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)	Non-coniferous Tree (Not Surveyed)	

ORDNANCE SURVEY PLAN

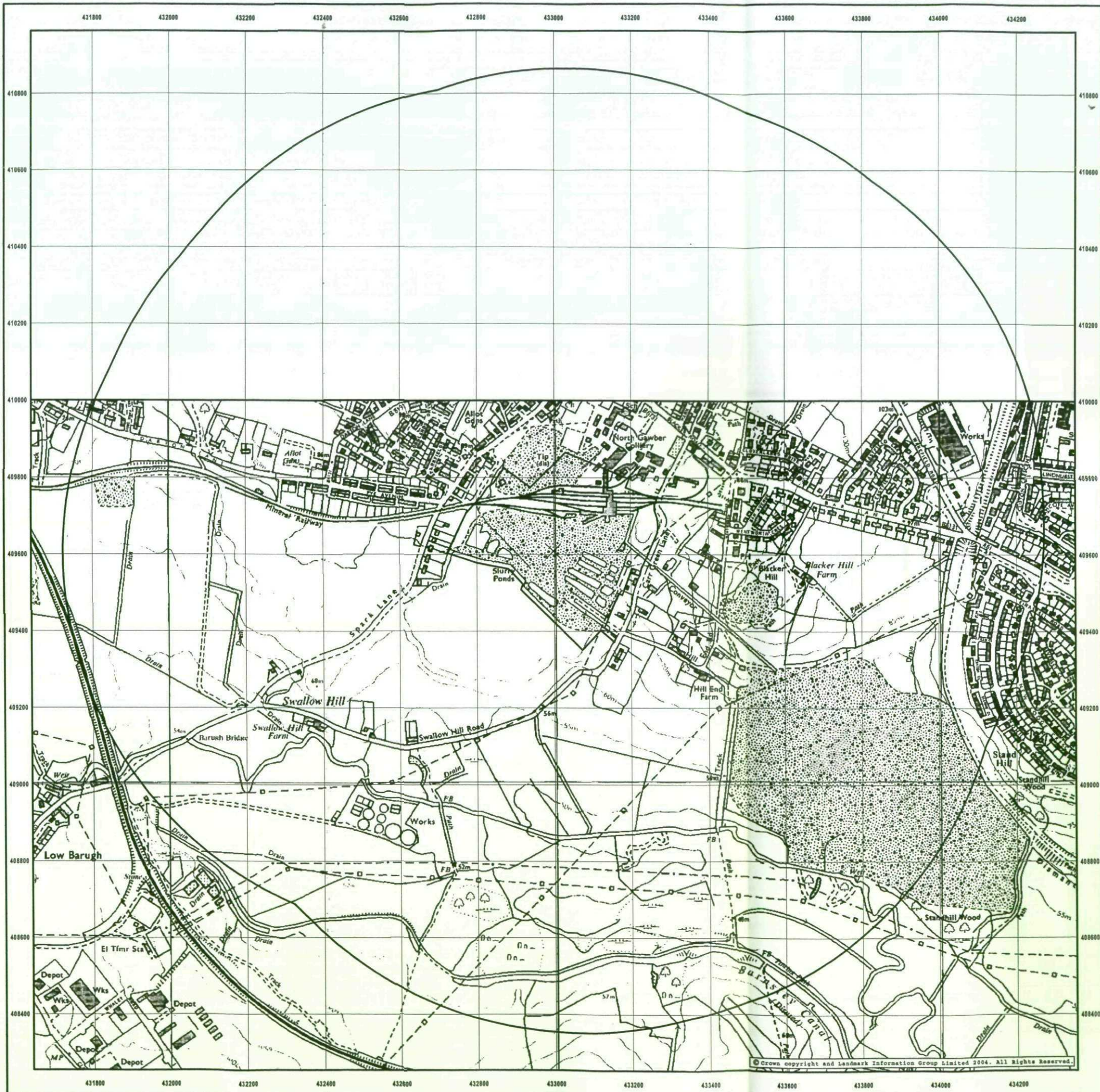
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940's. In 1864 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1936, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Source map scale - 1:1,250

1977	1977
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Date(s) of Publication

8 of 16



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(17-May-2004 11:00)

Customer Ref: Mr A Coverdale, SDA/04014
Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS **Grid Reference** 433000 409610

North Gawber Colliery
 Barmby

Historical Map Legend			
	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees
	Gravel Pit		Coniferous Trees
	Sand Pit		Scrub
	Disused Pit or Quarry		Lake, Loch or Pond
	Refuse or Slag Heap		Pylon
	Direction of Flow of Water		Electricity Transmission Line
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Shingle		Standard Gauge
	Sand		Multiple Track
	Marsh		Standard Gauge Single Track
	Heath		Siding, Tramway or Mineral Line
	Rough Grassland		Narrow Gauge
	Reeds		
	Saltings		
	Bracken		

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1930, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,000

1983

Date(s) of Publication

14 of 16



CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(23-May-2004 11:00)
 Customer Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

Historical Map Legend

	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees		Bracken
	Gravel Pit		Coniferous Trees		Heath
	Sand Pit		Scrub		Rough Grassland
	Disused Pit or Quarry		Lake, Loch or Pond		Reeds
	Refuse or Slag Heap		Pylon		Electricity Transmission Line
			Direction of Flow of Water		Marsh
			Shingle		
			Sand		
	Cutting		Embankment		Standard Gauge Multiple Track
	Road Under		Road Over		Standard Gauge Single Track
			Level Crossing		Siding, Tramway or Mineral Line
			Foot Bridge		Narrow Gauge

ORDNANCE SURVEY PLAN

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,000 maps. The published date given on the right therefore is often some years later than the surveys date. Before 1930, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

In the late 1940's a Provisional Edition was produced, which updated the 1:10,000 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overlaid with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Source map scale - 1:10,000

1991

1993

Date(s) of Publication

15 of 10

CLIENT DETAILS Envirocheck Order No. **EC3967251_1_1**
(28-May-2004 11:00)

Customer Ref: Mr A Coverdale, SDA/04014
Scott Doherty Associates
5, Derwentside Business Centre Consett Business Park
Consett
County Durham DH8 6BP

SITE DETAILS Grid Reference **433000 409610**

North Gawber Colliery
Barnsley

Historical Map Legend

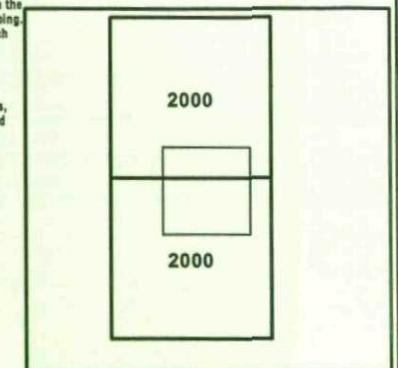
	Non-coniferous Trees		Pylon
	Coniferous Trees		Telephone Line (where shown)
	Orchard		Electricity Transmission Line (with poles)
	Rough Grassland		Gravel Pit
	Heath		Shingle
	Scrub		Refuse Tip or Slag Heap
	Marsh, Salt Marsh or Reeds		Sand
	County Boundary (England only)		Sand Pit
	Civil Parish or Community Boundary		Slopes
	Constituency Boundary		District, Unitary, Metropolitan, London Borough Boundary

ORDNANCE SURVEY PLAN

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan[®] which replaced the old 1:10,000 maps originally published in 1970.

The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Source map scale - 1:10,000



Date(s) of Publication



APPENDIX B
EXTRACTS FROM 'ENVIROCHECK' REPORT

Envirocheck[®] Report

Datasheet

Report on:

North Gawber Colliery
Barnsley

National Grid Reference :

433000, 409610

Prepared For :

Scott Doherty Associates
5, Derwentside Business Centre
Consett Business Park
Consett
County Durham
DH8 6BP

Your Reference:

Mr A Coverdale, SDA/04014

Summary

Agency & Hydrological

Waste

Hazardous Substances

Geological

Industrial Land Use

Sensitive Land Use

Data Currency

Data Suppliers & Copyright Statements

Useful Contacts

BGS Borehole Order Form

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity Datasheet places great emphasis on statutory data provided by the Environment Agency and the Scottish Environment Protection Agency; it also incorporates data from English Nature (and the Scottish and Welsh equivalents), the Environment Agency (and the Scottish equivalent) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the legend database to 1km from a single point or a site boundary provided by the client

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers

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Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological				
Air Pollution Controls				4
Air Pollution Control Enforcements				
Contaminated Land Register Entries and Notices				
Discharge Consents		3		17
Enforcement and Prohibition Notices				
Integrated Pollution Controls				
Integrated Pollution Prevention And Control				
Nearest Surface Water Feature	Yes			
Pollution Incidents to Controlled Waters		4	1	9
Substantiated Pollution Incident Register	1	2		4
Prosecutions Relating to Authorised Processes				
Prosecutions Relating to Controlled Waters				
Water Industry Act Referrals				
Registered Radioactive Substances				
River Quality				1
River Quality Biology Sampling Points				
River Quality Chemistry Sampling Points				
Water Abstractions				(*1)
Groundwater Vulnerability	Yes			
Fluvial Indicative Floodplains				
Tidal Indicative Floodplains				
Source Protection Zones				
River Flood Data (Scotland)				
Waste				
BGS Recorded Landfill Sites				
Integrated Pollution Control Registered Waste Sites				
Licensed Waste Management Facilities (Landfill Boundaries)				
Licensed Waste Management Facilities (Locations)		1		
Local Authority Recorded Landfill Sites		1	1	2
Registered Landfill Sites		1	1	3
Registered Waste Transfer Sites		1		
Registered Waste Treatment or Disposal Sites		1		

Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Hazardous Substances				
Control of Major Accident Hazards Sites (COMAH)				
Explosive Sites				
Notification of Installations Handling Hazardous Substances (NIHHS)				
Planning Hazardous Substance Consents				
Planning Hazardous Substance Enforcements				
Geological				
BGS Boreholes		7	45	31
BGS Recorded Mineral Sites				
BGS 1:625,000 Solid Geology	Yes			
Brine Compensation Areas				
Coal Mining Affected Areas	Yes			
Shallow Mining Hazards	Yes			
Compressible Ground Subsidence Hazards				
Ground Dissolution Subsidence Hazards				
Gulls And Cambering Subsidence Hazards	Yes	Yes		
Landslip Subsidence Hazards	Yes			
Swelling Clay Subsidence Hazards				
Mining Instability	Yes			
Natural and Mining Cavities				
Radon Affected Areas	Yes			
Radon Protection Measures	Yes			
Industrial Land Use				
Contemporary Trade Directory Entries		28	9	10
Fuel Station Entries				2

Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Uses				
Areas of Adopted Green Belt	1			
Areas of Unadopted Green Belt				
Areas of Outstanding Natural Beauty				
Environmentally Sensitive Areas				
Forest Parks				
Local Nature Reserves				
Marine Nature Reserves				
National Nature Reserves				
National Parks				
National Scenic Areas				
Nitrate Sensitive Areas				
Nitrate Vulnerable Zones	1			
Ramsar Sites				
Sites of Special Scientific Interest				
Special Areas of Conservation				
Special Protection Areas				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Air Pollution Controls					
1	Name: William Freeman Limited Location: Suba Seal Works, Wakefield Road, Mapplewell, Barnsley, South Yorkshire, S75 6DH Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Epa101 Dated: 29th November 1999 Process Type: Local Authority Air Pollution Control Description: PG6/28 Rubber processes Status: Application has been authorised and any conditions apply to the operator Positional: Automatically positioned to the address Accuracy:	E	777	1	434030 409910
Air Pollution Controls					
2	Name: William Freeman Limited Location: Wakefield Road, Staincross, Barnsley, South Yorkshire, S75 6DH Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Epa102 Dated: 6th March 2000 Process Type: Local Authority Air Pollution Control Description: PG6/32 Adhesive coating Status: Application has been authorised and any conditions apply to the operator Positional: Automatically positioned to the address Accuracy:	E	777	1	434030 409910
Air Pollution Controls					
3	Name: Turn Pike Garage Location: Wakefield Road, Mapplewell, BARNSELEY, South Yorkshire, S75 6JX Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Epa/Petrol07 Dated: 24th March 1999 Process Type: Local Authority Air Pollution Control Description: PG 1/14 Petrol filling station Status: Application has been authorised and any conditions apply to the operator Positional: Automatically positioned to the address Accuracy:	NE	828	1	433450 410590
Air Pollution Controls					
4	Name: Walter Franks & Son Ltd Location: Wakefield Road, BARNSELEY, South Yorkshire, S71 3LU Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Epa36 Dated: 19th March 1993 Process Type: Local Authority Air Pollution Control Description: PG2/6 Aluminium and aluminium alloy processes Status: Application has been authorised and any conditions apply to the operator Positional: Automatically positioned to the address Accuracy:	E	865	1	434130 409700
Discharge Consents					
5	Operator: Yorkshire Water Services Ltd Property Type: Undefined Or Other Location: Carr Green Lane, Mapplewell, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C4139 Permit Version: 1 Effective Date: 20th December 1985 Issued Date: 20th December 1985 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Unnamed Trib Of River Dearne Status: Transferred from COPA 1974 Positional: Located by supplier to within 100m Accuracy:	S	62	2	433080 409290

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Discharge Consents				
5	Operator: Yorkshire Water Services Ltd Property Type: Sewerage Network - Sewers Location: Carr Green Lane,MAPPLEWELL, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 30th June 1993 Revocation Date: Not Supplied Discharge Type: Sewage Effluent Discharge-Storm Effluent Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional: Located by supplier to within 100m Accuracy:	S	77	2	433100 409280
	Discharge Consents				
5	Operator: Yorkshire Water Services Ltd Property Type: Sewerage Network - Sewers Location: Carr Green Lane,MAPPLEWELL, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 5th June 1963 Revocation Date: Not Supplied Discharge Type: Sewage Effluent Discharge-Storm Effluent Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional: Located by supplier to within 100m Accuracy:	S	81	2	433100 409280
	Discharge Consents				
6	Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 4 Effective Date: 18th October 1999 Issued Date: 18th October 1999 Revocation Date: 30th September 2000 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Dearne Status: Varied by Application - (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional: Located by supplier to within 10m Accuracy:	SW	611	2	432620 408940

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Discharge Consents					
6	Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 5 Effective Date: 1st October 2000 Issued Date: 18th October 1999 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Dearne Status: Varied by Application - (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	SW	611	2	432620 408940
Discharge Consents					
6	Operator: Darton Rural District Council Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 6 Effective Date: 17th January 1966 Issued Date: 17th January 1966 Revocation Date: 22nd December 1988 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Dearne Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961 Positional Accuracy: Located by supplier to within 100m	SW	653	2	432600 408900
Discharge Consents					
6	Operator: Darton Rural District Council Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 6 Effective Date: 17th January 1966 Issued Date: 17th January 1966 Revocation Date: 22nd December 1988 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Dearne Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961 Positional Accuracy: Located by supplier to within 100m	SW	653	2	432600 408900
Discharge Consents					
7	Operator: Yorkshire Water Authority Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 1 Effective Date: 23rd December 1988 Issued Date: 23rd December 1988 Revocation Date: 12th July 1990 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Dearne Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m	S	617	2	432700 408860

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Discharge Consents					
7	Operator: YORKSHIRE WATER SERVICES LTD Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 2 Effective Date: 13th July 1990 Issued Date: 13th July 1990 Revocation Date: 31st December 1992 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: RIVER DEARNE Status: Transferred from Water Act 1989 Positional: Located by supplier to within 10m Accuracy:	S	617	2	432700 408860
Discharge Consents					
7	Operator: Yorkshire Water Authority Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 1 Effective Date: 23rd December 1988 Issued Date: 23rd December 1988 Revocation Date: 12th July 1990 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Dearne Status: Transferred from COPA 1974 Positional: Located by supplier to within 10m Accuracy:	S	617	2	432700 408860
Discharge Consents					
7	Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 2 Effective Date: 13th July 1990 Issued Date: 13th July 1990 Revocation Date: 31st December 1992 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Dearne Status: Transferred from Water Act 1989 Positional: Located by supplier to within 10m Accuracy:	S	617	2	432700 408860
Discharge Consents					
7	Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 3 Effective Date: 1st January 1993 Issued Date: 13th July 1990 Revocation Date: 17th October 1999 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Dearne Status: Transferred from Water Act 1989 Positional: Located by supplier to within 10m Accuracy:	S	617	2	432700 408860

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Discharge Consents					
7	Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 3 Effective Date: 1st January 1993 Issued Date: 13th July 1990 Revocation Date: 17th October 1999 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Dearne Status: Transferred from Water Act 1989 Positional Accuracy: Located by supplier to within 10m	S	617	2	432700 408860
Discharge Consents					
8	Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 5 Effective Date: 1st October 2000 Issued Date: 18th October 1999 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Dearne Status: Varied by Application - (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	SW	667	2	432510 408970
Discharge Consents					
8	Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 4 Effective Date: 18th October 1999 Issued Date: 18th October 1999 Revocation Date: 30th September 2000 Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Dearne Status: Varied by Application - (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	SW	672	2	432500 408970

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
8	Discharge Consents Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 4 Effective Date: 18th October 1999 Issued Date: 18th October 1999 Revocation Date: 30th September 2000 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Dearne Status: Varied by Application - (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	SW	672	2	432500 408970
8	Discharge Consents Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Darton Wwtw Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2026 Permit Version: 5 Effective Date: 1st October 2000 Issued Date: 18th October 1999 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Dearne Status: Varied by Application - (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	SW	672	2	432500 408970
9	Discharge Consents Operator: Yorkshire Water Services Ltd Property Type: Coal Extraction, Surface Location: Barugh Bridge R. Dearne Occs Dearne Hall Road, Low Barugh, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wra8062 Permit Version: 1 Effective Date: 1st April 2004 Issued Date: 17th November 2003 Revocation Date: 31st December 2004 Discharge Type: Trade Discharges - Site Drainage Discharge: Freshwater Stream/River Environment: Receiving Water: River Dearne Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	SW	807	2	432200 408990

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Discharge Consents					
10	Operator: Yorkshire Water Services Ltd Property Type: Sewerage Network - Sewers Location: Darton Lane Sws,BARNSLEY, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: WA6007 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Surface Water Effluent Discharge: Freshwater Stream/River Environment: Receiving Water: Dearne Status: Not Supplied Positional: Located by supplier to within 100m Accuracy:	SW	898	2	431950 409150
Discharge Consents					
11	Operator: Yorkshire Water Services Ltd Property Type: Sewerage Network - Sewers Location: Dearne Hill Road,LOW BARUGH, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 5th June 1963 Revocation Date: Not Supplied Discharge Type: Sewage Effluent Discharge-Storm Effluent Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional: Located by supplier to within 100m Accuracy:	SW	943	2	431940 409080
Pollution Incidents to Controlled Waters					
12	Property Type: Industrial Premises Location: Footbridge/Footbridge Dearne 18 Authority: Environment Agency, North East Region Pollutant: Chemicals - Detergents/Surfactant Note: Not Supplied Incident Date: 12th September 1994 Incident Reference: 153128 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	SE	41	2	433200 409400
Pollution Incidents to Controlled Waters					
13	Property Type: Miscellaneous Premises: Unknown Location: Footbridge/Footbridge Dearne 18 Authority: Environment Agency, North East Region Pollutant: Chemicals - Detergents/Surfactant Note: Not Supplied Incident Date: 12th September 1994 Incident Reference: 153431 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	S	58	2	433100 409300

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Pollution Incidents to Controlled Waters					
14	Property Type: Fire Water Location: Blacker Road, Hepplewell, BARNSELY Authority: Environment Agency, North East Region Pollutant: Unknown Sewage Note: Watercourse :River Dearne; From New Lodge To Old Mill Incident Date: 19th February 1998 Incident Reference: SH980080 Catchment Area: Dearne Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	NE	66	2	433300 409800
Pollution Incidents to Controlled Waters					
15	Property Type: Water Company Sewage: Foul Sewer Location: Footbridge/Footbridge Dearne 18 Authority: Environment Agency, North East Region Pollutant: Unknown Note: Not Supplied Incident Date: 14th September 1992 Incident Reference: 136720 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	N	81	2	432900 409900
Pollution Incidents to Controlled Waters					
16	Property Type: Industrial Premises Location: Mouth/Todmorden Calder Afl Authority: Environment Agency, North East Region Pollutant: Oils - Diesel (Including Agricultural) Note: Not Supplied Incident Date: 12th March 1991 Incident Reference: 120419 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	E	437	2	433700 409800
Pollution Incidents to Controlled Waters					
17	Property Type: Water Company Sewage: Sewage Treatment Works Location: Footbridge/Footbridge Dearne 18 Authority: Environment Agency, North East Region Pollutant: Sewage - Treated Effluent Note: Not Supplied Incident Date: 18th July 1990 Incident Reference: 112757 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 2 - Significant Incident Positional: Located by supplier to within 100m Accuracy:	S	556	2	433000 408800
Pollution Incidents to Controlled Waters					
18	Property Type: Water Company Sewage: Foul Sewer Location: Footbridge/ Road Bridge B6428 Dearne 19 Authority: Environment Agency, North East Region Pollutant: Crude Sewage Note: Not Supplied Incident Date: 17th March 1993 Incident Reference: 145877 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	SW	662	2	432200 409200

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Pollution Incidents to Controlled Waters					
19	Property Type: Water Company Sewage: Sewage Treatment Works Location: Footbridge/ Road Bridge B6428 Dearne 19 Authority: Environment Agency, North East Region Pollutant: Sewage Sludge Note: Not Supplied Incident Date: 11th April 1989 Incident Reference: 6849 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 2 - Significant Incident Positional: Located by supplier to within 100m Accuracy:	SW	724	2	432500 408900
Pollution Incidents to Controlled Waters					
19	Property Type: Water Company Sewage: Sewage Treatment Works Location: Footbridge/ Road Bridge B6428 Dearne 19 Authority: Environment Agency, North East Region Pollutant: Unknown Note: Not Supplied Incident Date: 16th June 1990 Incident Reference: 111816 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 1 - Major Incident Positional: Located by supplier to within 100m Accuracy:	SW	724	2	432510 408900
Pollution Incidents to Controlled Waters					
19	Property Type: Water Company Sewage: Sewage Treatment Works Location: Footbridge/ Road Bridge B6428 Dearne 19 Authority: Environment Agency, North East Region Pollutant: Unknown Note: Not Supplied Incident Date: 14th June 1990 Incident Reference: 111764 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 1 - Major Incident Positional: Located by supplier to within 100m Accuracy:	SW	727	2	432500 408900
Pollution Incidents to Controlled Waters					
20	Property Type: Water Company Sewage: Foul Sewer Location: Road Bridge B6428 /Road Brdg B6131 Dearne 20 Authority: Environment Agency, North East Region Pollutant: Unknown Sewage Note: Not Supplied Incident Date: 21st June 1989 Incident Reference: 100461 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 2 - Significant Incident Positional: Located by supplier to within 100m Accuracy:	SW	727	2	432200 409100
Pollution Incidents to Controlled Waters					
21	Property Type: Water Company Sewage: Storm Overflow Location: Dearne Hall Road, BARUGH Authority: Environment Agency, North East Region Pollutant: Sewage - Storm Overflow Note: No Fish Killed Incident Date: 26th September 1997 Incident Reference: SH970516 Catchment Area: Dearne Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	SW	882	2	432000 409100

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Pollution Incidents to Controlled Waters					
22	Property Type: Miscellaneous Premises: Unknown Location: Road Bridge B6428 /,Road Brdg B6131 Dearnie 20 Authority: Environment Agency, North East Region Pollutant: Mining Water Note: Not Supplied Incident Date: 14th April 1991 Incident Reference: 121394 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	SW	966	2	431900 409100
Pollution Incidents to Controlled Waters					
22	Property Type: Water Company Sewage: Storm Overflow Location: LOW BARUGH Authority: Environment Agency, North East Region Pollutant: Sewage - Storm Overflow Note: River Dearnie; Fish Killed: No Information Incident Date: 16th August 1998 Incident Reference: SH980317 Catchment Area: Dearnie Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional: Located by supplier to within 100m Accuracy:	SW	969	2	431900 409100
Substantiated Pollution Incident Register					
23	Authority: Environment Agency - North East Region, Ridings Area Incident Date: 14th June 2001 Incident Reference: 9372 Water Impact: Category 4 - No Impact Air Impact: Category 2 - Significant Incident Land Impact: Category 3 - Minor Incident Positional: Located by supplier to within 10m Accuracy: Pollutant: Atmospheric Pollutants And Effects: Smoke Contaminated Water: Firefighting Run-Off	NE	0	2	433090 409820
Substantiated Pollution Incident Register					
24	Authority: Environment Agency - North East Region, Ridings Area Incident Date: 19th September 2002 Incident Reference: 109062 Water Impact: Category 3 - Minor Incident Air Impact: Category 3 - Minor Incident Land Impact: Category 4 - No Impact Positional: Located by supplier to within 10m Accuracy: Pollutant: Oils - Unknown	S	47	2	433080 409310
Substantiated Pollution Incident Register					
25	Authority: Environment Agency - North East Region, Ridings Area Incident Date: 8th August 2001 Incident Reference: 22839 Water Impact: Category 3 - Minor Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional: Located by supplier to within 10m Accuracy: Pollutant: Crude Sewage	S	72	2	433030 409290
Substantiated Pollution Incident Register					
26	Authority: Environment Agency - North East Region, Ridings Area Incident Date: 14th July 2003 Incident Reference: 173615 Water Impact: Category 3 - Minor Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional: Located by supplier to within 10m Accuracy: Pollutant: Crude Sewage	SW	881	2	432000 409110

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Substantiated Pollution Incident Register					
26	Authority: Environment Agency - North East Region, Ridings Area Incident Date: 28th July 2003 Incident Reference: 177258 Water Impact: Category 3 - Minor Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional: Located by supplier to within 10m Accuracy: Pollutant: Crude Sewage	SW	884	2	431990 409110
Substantiated Pollution Incident Register					
26	Authority: Environment Agency - North East Region, Ridings Area Incident Date: 22nd January 2002 Incident Reference: 53844 Water Impact: Category 3 - Minor Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional: Located by supplier to within 10m Accuracy: Pollutant: Crude Sewage	SW	918	2	431960 409100
Substantiated Pollution Incident Register					
27	Authority: Environment Agency - North East Region, Ridings Area Incident Date: 7th October 2002 Incident Reference: 113015 Water Impact: Category 3 - Minor Incident Air Impact: Category 4 - No Impact Land Impact: Category 3 - Minor Incident Positional: Located by supplier to within 10m Accuracy: Pollutant: Oils - Lubricating	SE	971	2	433820 408670
River Quality					
	Name: River_Dearne GQA Grade: River Quality C Reach: Cawthorne_Dyke_New_Lodg Estimated Distance of Reach (km): 2 Flow Rate: Flow less than 0.62 cumecs Flow Type: River Year: 2000	S	519	2	432830 408860
Water Abstractions					
	Operator: Shaw Carpets Ltd Licence Number: 2/27/08/114 Permit Version: Not Supplied Location: Po Box. 4,Darton,BARNESLEY Authority: Environment Agency, North East Region Abstraction: Commercial Use(pubs etc) Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 312 Yearly Rate (m3): 85072 Details: Licence Status: Active Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional: Located by supplier to within 100m Accuracy:	W	1328	2	431400 409700
Groundwater Vulnerability					
	Geological Classification: Minor Aquifer (Variably permeable) - These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 11 South Pennines Scale: 1:100,000	-	0	2	433000 409610

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Drift Deposits					
Description	None	-	-	-	-
Fluvial Indicative Floodplains					
Description	None	-	-	-	-
Tidal Indicative Floodplains					
Description	None	-	-	-	-
River Flood Data (Scotland)					
Description	None	-	-	-	-

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Licensed Waste Management Facilities (Locations)					
28	Licence Number: 60555 Location: Wentworth Road, Mapplewell, Barnsley, South Yorkshire, S75 6BS Operator Name: Mapplewell Autosalvage Operator Location: Wentworth Road, Mapplewell, Barnsley, S Yorks, S75 6BS Authority: Environment Agency - North East Region, Ridings Area Site Category: Metal Recycling Sites (Vehicle Dismantlers) Licence Status: Issued Issued: 22nd November 1996 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	E	183	2	433400 409500
Local Authority Landfill Coverage					
	Name: Barnsley Metropolitan Borough Council - Has supplied landfill data	-	0	1	433000 409610
Local Authority Recorded Landfill Sites					
29	Location: Not Supplied Reference: 19 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional accuracy: Positioned by the supplier Boundary Quality: Moderate	E	217	1	433430 409480
Local Authority Recorded Landfill Sites					
30	Location: Not Supplied Reference: 69 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional accuracy: Positioned by the supplier Boundary Quality: Moderate	SW	479	1	432360 409300
Local Authority Recorded Landfill Sites					
31	Location: Not Supplied Reference: 82 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional accuracy: Positioned by the supplier Boundary Quality: Moderate	NE	793	1	434000 410040
Local Authority Recorded Landfill Sites					
32	Location: Not Supplied Reference: 98 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional accuracy: Positioned by the supplier Boundary Quality: Moderate	W	871	1	431880 409410

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Registered Landfill Sites					
33	Licence Holder: Blacker Hill Quarries Ltd Licence Reference: WD20 B 278 Site Location: Blacker Hill Quarry, Mapplewell, Darton, Barnsley, South Yorkshire Licence Easting: 433500 Licence Northing: 409450 Operator Location: As Site Address Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill Maximum Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st April 1980 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Ind. Non-Haz. Waste	E	43	2	433260 409530
Registered Landfill Sites					
34	Licence Holder: N.C.B. Licence Reference: WD20 B 176 MOD 1 Site Location: Quarry At Spark Lane, Mapplewell, Darton, Barnsley, South Yorkshire Licence Easting: 432350 Licence Northing: 409250 Operator Location: Barnsley Area Off. Grimethorpe, Barnsley, South Yorkshire Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill Maximum Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st July 1983 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Prohibited Waste: Liquids In Containers Over 4l Cap. Slurry In Containers Over 4l Cap.	SW	265	2	432570 409370

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Registered Landfill Sites					
35	<p>Licence Holder: William Freeman & Co. Licence Reference: WD20 B 364 MOD 1 Site Location: Suba Seal Works, Staincross, Darton, Barnsley, South Yorkshire Licence Easting: 434100 Licence Northing: 409900 Operator Location: As Site Address Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill Maximum Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st April 1983 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional: Manually positioned to the address or location Accuracy: Boundary Accuracy: Not Applicable Authorised Waste: Com. + Ind. Waste Soil, Subsoil Prohibited Waste: All Forms Of Asbestos Waste</p>	E	597	2	433860 409840
Registered Landfill Sites					
36	<p>Licence Holder: C Birkinshaw & Sons Ltd Licence Reference: WD20 B 490 Site Location: Between Darton Lane, & Dearne Hall Road, Darton, Barnsley, South Yorkshire Licence Easting: 431850 Licence Northing: 409300 Operator Location: Oaks Farm, Darton Lane, Darton, Barnsley, South Yorkshire Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill Maximum Input Rate: Large (Equal to or greater than 75,000 and less than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence revoked Dated: 21st October 1985 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional: Manually positioned to the address or location Accuracy: Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Excavated Natural Materials \$ Hardcore And Rubble Prohibited Waste: Asbestos Biodegradable/Putrescible Waste Combustible/Potentially Combustible Liquids In Containers Over 4l Cap. Slurry In Containers Over 4l Cap.</p>	W	676	2	432090 409370

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Registered Landfill Sites					
37	<p>Licence Holder: Shaw Carpets Ltd Licence Reference: WD20 B 265 Site Location: Barnsley Road, Darton, Barnsley, South Yorkshire Licence Easting: 431680 Licence Northing: 409450 Operator Location: As Site Address Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill Maximum Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source: Only waste produced on site Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st April 1980 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional: Manually positioned to the address or location Accuracy: Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Ind. Non-Haz. Waste Soil & Subsoil Prohibited Waste: Asbestos Liquids In Containers Over 4l Cap. Slurry In Containers Over 4l Cap.</p>	W	806	2	431930 409480
Registered Waste Transfer Sites					
38	<p>Licence Holder: B Eaton Licence Reference: WD20 B 439 MOD 1 Site Location: 114 Wentworth Road, Mapplewell, Darton, BARNSELEY, South Yorkshire, S75 6DU Operator Location: As Site Address Authority: Environment Agency - North East Region, Ridings Area Site Category: Transfer Maximum Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st October 1984 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional: Manually positioned to the road within the address or location Accuracy: Boundary Quality: Not Supplied Authorised Waste: Com. + Ind. Non-Haz. Waste Ind. Non-Haz. Potentially Combustible Prohibited Waste: Asbestos Liquids In Containers Over 4l Cap. Slurry In Containers Over 4l Cap.</p>	E	186	2	433420 409540

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Registered Waste Treatment or Disposal Sites					
39	Licence Holder: Mapplewell Auto Salvage Licence Reference: WD20 B1126 MOD 2 Site Location: Wentworth Road, Mapplewell, Staincross, BARNSELY, South Yorkshire, S75 6BS Operator Location: As Site Address Authority: Environment Agency - North East Region, Ridings Area Site Category: Scrapyard Maximum Input: Very Small (Less than 10,000 tonnes per year) Rate: Waste Source: No known restriction on source of waste Restrictions: Licence Status: Operational as far as is known Dated: 22nd November 1996 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional: Manually positioned to the address or location Accuracy: Boundary Quality: Not Supplied Authorised Waste: Max.Waste Permitted By Licence Scrap Motor Vehicles Max.Stor Tyres Max.Stor Prohibited Waste: Liquid Wastes Waste N.O.S.	E	187	2	433450 409720

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
BGS Boreholes					
40	BGS Reference: Se30nw18 Drilled Length (m): Not Supplied Borehole Name: North Gawber Colliery 2	NE	6	3	433100 409840
BGS Boreholes					
41	BGS Reference: Se30nw9/A Drilled Length (m): 93.27 Borehole Name: North Gawber Colliery Blacker	NE	66	3	433300 409800
BGS Boreholes					
41	BGS Reference: Se30nw9/B Drilled Length (m): 103.63 Borehole Name: North Gawber Colliery Barnsley To Lidgett	NE	66	3	433300 409800
BGS Boreholes					
41	BGS Reference: Se30nw9/C Drilled Length (m): 203 Borehole Name: North Garber Colliery New Lidgett Shaft	NE	66	3	433300 409800
BGS Boreholes					
42	BGS Reference: Se30nw547 Drilled Length (m): 3.66 Borehole Name: Staincross Health Centre 6	NW	224	3	432730 410000
BGS Boreholes					
42	BGS Reference: Se31sw292 Drilled Length (m): 3.66 Borehole Name: Staincross Health Centre 5	NW	240	3	432720 410010
BGS Boreholes					
42	BGS Reference: Se30nw546 Drilled Length (m): 6.1 Borehole Name: Staincross Health Centre 4	NW	244	3	432700 410000
BGS Boreholes					
42	BGS Reference: Se31sw291 Drilled Length (m): 2.36 Borehole Name: Staincross Health Centre 3	NW	253	3	432700 410010
BGS Boreholes					
43	BGS Reference: Se31sw290 Drilled Length (m): 3.05 Borehole Name: Staincross Health Centre 2	NW	281	3	432680 410030
BGS Boreholes					
43	BGS Reference: Se31sw289 Drilled Length (m): 3.05 Borehole Name: Staincross Health Centre 1	NW	282	3	432660 410010
BGS Boreholes					
44	BGS Reference: Se31sw227 Drilled Length (m): 3.05 Borehole Name: Darton Mapplewell Sch Bh 2	N	325	3	432950 410180
BGS Boreholes					
44	BGS Reference: Se31sw230 Drilled Length (m): 3.05 Borehole Name: Darton Mapplewell Sch Bh 5	N	347	3	432910 410190
BGS Boreholes					
44	BGS Reference: Se31sw226 Drilled Length (m): 2.74 Borehole Name: Darton Mapplewell Sch Bh 1	N	360	3	432970 410220
BGS Boreholes					
45	BGS Reference: Se31sw237 Drilled Length (m): 3.05 Borehole Name: Staincross Health Centre Bh B	NW	329	3	432750 410130
BGS Boreholes					
45	BGS Reference: Se31sw236 Drilled Length (m): 3.05 Borehole Name: Staincross Health Centre Bh A	NW	354	3	432760 410160

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes				
46	BGS Reference: Se31sw229 Drilled Length (m): 3.05 Borehole Name: Darton Mapplewell Sch Bh 4	N	379	3	432930 410230
	BGS Boreholes				
46	BGS Reference: Se31sw232 Drilled Length (m): 3.05 Borehole Name: Darton Mapplewell Sch Bh 7	N	410	3	432890 410250
	BGS Boreholes				
47	BGS Reference: Se31sw233 Drilled Length (m): 3.05 Borehole Name: Darton Mapplewell Sch Bh 8	N	380	3	432870 410210
	BGS Boreholes				
47	BGS Reference: Se31sw272 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 7	N	406	3	432840 410230
	BGS Boreholes				
47	BGS Reference: Se31sw235 Drilled Length (m): 2.74 Borehole Name: Darton Mapplewell Sch Bh 10	N	417	3	432840 410240
	BGS Boreholes				
48	BGS Reference: Se30nw47 Drilled Length (m): Not Supplied Borehole Name: New Lodge 2 Surface Bh	SE	381	3	433520 409260
	BGS Boreholes				
49	BGS Reference: Se31sw274 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 9	N	386	3	432790 410200
	BGS Boreholes				
49	BGS Reference: Se31sw273 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 8	N	391	3	432820 410210
	BGS Boreholes				
49	BGS Reference: Se31sw271 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 6	N	412	3	432780 410230
	BGS Boreholes				
50	BGS Reference: Se31sw228 Drilled Length (m): 3.05 Borehole Name: Darton Mapplewell Sch Bh 3	N	423	3	432950 410280
	BGS Boreholes				
50	BGS Reference: Se31sw231 Drilled Length (m): 3.05 Borehole Name: Darton Mapplewell Sch Bh 6	N	461	3	432910 410310
	BGS Boreholes				
51	BGS Reference: Se31sw270 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 5	N	430	3	432810 410250
	BGS Boreholes				
51	BGS Reference: Se31sw269 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 4	N	446	3	432840 410270
	BGS Boreholes				
51	BGS Reference: Se31sw268 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 3	N	450	3	432780 410260
	BGS Boreholes				
51	BGS Reference: Se31sw267 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 2	N	471	3	432810 410290

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes				
52	BGS Reference: Se31sw150 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh1	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw151 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh2	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw152 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh3	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw153 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh4	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw154 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh5	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw155 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh6	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw156 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh7	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw157 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh8	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw158 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh9	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw159 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh10	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw160 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh11	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw161 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh12	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw163 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh14	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw164 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh15	N	436	3	433000 410300
	BGS Boreholes				
52	BGS Reference: Se31sw165 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh16	N	436	3	433000 410300

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
BGS Boreholes					
52	BGS Reference: Se31sw166 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh17	N	436	3	433000 410300
BGS Boreholes					
52	BGS Reference: Se31sw168 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh19	N	436	3	433000 410300
BGS Boreholes					
52	BGS Reference: Se31sw169 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh20	N	436	3	433000 410300
BGS Boreholes					
52	BGS Reference: Se31sw162 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh13	N	436	3	433000 410300
BGS Boreholes					
52	BGS Reference: Se31sw167 Drilled Length (m): Not Supplied Borehole Name: New Road Staincross Bh18	N	436	3	433000 410300
BGS Boreholes					
53	BGS Reference: Se31sw234 Drilled Length (m): 2.44 Borehole Name: Darton Mapplewell Sch Bh 9	N	464	3	432870 410300
BGS Boreholes					
54	BGS Reference: Se31sw266 Drilled Length (m): 3 Borehole Name: Darton Mapplewell Site 1 Bh 1	N	486	3	432770 410300
BGS Boreholes					
55	BGS Reference: Se30hw64 Drilled Length (m): 16.76 Borehole Name: Dodworth Colliery No.5 Ugbh	S	727	3	432880 408650
BGS Boreholes					
56	BGS Reference: Se31sw27 Drilled Length (m): 36.58 Borehole Name: Staincross Nr.Barnsley	NE	749	3	433930 410100
BGS Boreholes					
57	BGS Reference: Se31sw94 Drilled Length (m): 92.89 Borehole Name: Woolley Colliery No.64 Ugbh	NE	790	3	433490 410530
BGS Boreholes					
58	BGS Reference: Se31sw4 Drilled Length (m): 43.98 Borehole Name: North Gawber Colliery No.3	NE	875	3	433740 410480
BGS Boreholes					
59	BGS Reference: Se31sw219 Drilled Length (m): 4 Borehole Name: Oaks Farm Est Darton Bh 36	NW	907	3	431940 410070
BGS Boreholes					
59	BGS Reference: Se31sw207 Drilled Length (m): 5 Borehole Name: Oaks Farm Est Darton Bh 24	NW	917	3	431940 410090
BGS Boreholes					
59	BGS Reference: Se31sw218 Drilled Length (m): 4 Borehole Name: Oaks Farm Est Darton Bh 35	NW	919	3	431930 410070
BGS Boreholes					
59	BGS Reference: Se31sw195 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 12	NW	927	3	431940 410100

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
BGS Boreholes					
59	BGS Reference: Se31sw206 Drilled Length (m): 5 Borehole Name: Oaks Farm Est Darton Bh 23	NW	932	3	431920 410090
BGS Boreholes					
59	BGS Reference: Se31sw217 Drilled Length (m): 4 Borehole Name: Oaks Farm Est Darton Bh 34	NW	932	3	431920 410070
BGS Boreholes					
59	BGS Reference: Se31sw194 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 11	NW	940	3	431920 410110
BGS Boreholes					
59	BGS Reference: Se31sw205 Drilled Length (m): 5 Borehole Name: Oaks Farm Est Darton Bh 22	NW	946	3	431910 410090
BGS Boreholes					
59	BGS Reference: Se31sw216 Drilled Length (m): 4 Borehole Name: Oaks Farm Est Darton Bh 33	NW	946	3	431900 410080
BGS Boreholes					
60	BGS Reference: Se31sw19 Drilled Length (m): 19.58 Borehole Name: Woolley Colliery 16 U/G	NE	936	3	433630 410630
BGS Boreholes					
60	BGS Reference: Se31sw18 Drilled Length (m): 19.3 Borehole Name: Woolley Colliery 15 U/G	NE	954	3	433670 410630
BGS Boreholes					
61	BGS Reference: Se31sw193 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 10	NW	951	3	431910 410110
BGS Boreholes					
61	BGS Reference: Se31sw204 Drilled Length (m): 5 Borehole Name: Oaks Farm Est Darton Bh 21	NW	959	3	431900 410100
BGS Boreholes					
61	BGS Reference: Se31sw192 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 9	NW	963	3	431900 410110
BGS Boreholes					
61	BGS Reference: Se31sw225 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 42	NW	974	3	431890 410110
BGS Boreholes					
61	BGS Reference: Se31sw215 Drilled Length (m): 4 Borehole Name: Oaks Farm Est Darton Bh 32	NW	975	3	431870 410090
BGS Boreholes					
61	BGS Reference: Se31sw221 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 38	NW	976	3	431890 410110
BGS Boreholes					
61	BGS Reference: Se31sw224 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 41	NW	980	3	431880 410110
BGS Boreholes					
61	BGS Reference: Se31sw203 Drilled Length (m): 5 Borehole Name: Oaks Farm Est Darton Bh 20	NW	980	3	431880 410100

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
BGS Boreholes					
61	BGS Reference: Se31sw191 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 8	NW	984	3	431880 410120
BGS Boreholes					
61	BGS Reference: Se31sw223 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 40	NW	986	3	431880 410110
BGS Boreholes					
61	BGS Reference: Se31sw222 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 39	NW	988	3	431870 410110
BGS Boreholes					
61	BGS Reference: Se31sw220 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 37	NW	990	3	431870 410120
BGS Boreholes					
61	BGS Reference: Se31sw202 Drilled Length (m): 5 Borehole Name: Oaks Farm Est Darton Bh 19	NW	993	3	431860 410100
BGS Boreholes					
61	BGS Reference: Se31sw190 Drilled Length (m): 6 Borehole Name: Oaks Farm Est Darton Bh 7	NW	996	3	431870 410120
BGS Boreholes					
62	BGS Reference: Se31sw214 Drilled Length (m): 4 Borehole Name: Oaks Farm Est Darton Bh 31	NW	986	3	431860 410090
BGS Boreholes					
62	BGS Reference: Se31sw213 Drilled Length (m): 4 Borehole Name: Oaks Farm Est Darton Bh 30	NW	1000	3	431850 410090
BGS 1:625,000 Solid Geology					
	Description: Lower Westphalian (mainly Productive Coal Measures)	-	0	4	433000 409610
Coal Mining Affected Areas					
	Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	-	0	5	433000 409610
Shallow Mining Hazards					
	Risk: Low-Moderate Source: British Geological Survey, Information Services Group	-	0	4	433000 409610
Compressible Ground Subsidence Hazards					
	Description: No Hazard	-	-	-	-
Ground Dissolution Subsidence Hazards					
	Description: No Hazard	-	-	-	-
Gulls And Cambering Subsidence Hazards					
	Risk: Low Source: British Geological Survey, Information Services Group	-	0	4	433000 409610
Gulls And Cambering Subsidence Hazards					
	Risk: Low Source: British Geological Survey, Information Services Group	N	135	4	433000 410000
Landslip Subsidence Hazards					
	Risk: Low Source: British Geological Survey, Information Services Group	-	0	4	433000 409610

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Swelling Clay Subsidence Hazards				
	Description: No Hazard	-	-	-	-
	Mining Instability				
	Mining Evidence: Inconclusive Coal Mining	-	0	-	433000
	Source: Ove Arup & Partners				409610
	Boundary Quality: As Supplied				
	Radon Affected Areas				
	Description: Between 1% and 3% of homes are above the Action Level	-	0	6	433000
	Source: National Radiological Protection Board				409610
	Radon Protection Measures				
	Type: Basic radon protective measures should be installed	-	0	4	433000
	Source: British Geological Survey, Information Services Group				409610
	Radon Protection Measures				
	Type: No radon protective measures are necessary	NW	0	4	432800
	Source: British Geological Survey, Information Services Group				409740

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
63	Name: Specialised Aerosols Co Ltd Location: Carr Green Lane, Mapplewell, Barnsley, South Yorkshire, S75 6DY Classification: Chemicals & Allied Products Status: Active Positional: Automatically positioned to the address Accuracy:	SE	13	-	433150 409410
Contemporary Trade Directory Entries					
64	Name: D & S Motors Location: 29, Spark Lane, Mapplewell, Barnsley, South Yorkshire, S75 6AA Classification: Garage Services Status: Active Positional: Automatically positioned to the address Accuracy:	N	94	-	433010 409960
Contemporary Trade Directory Entries					
64	Name: O'Briens Location: The Garage, Spark Lane, Mapplewell, Barnsley, South Yorkshire, S75 6AA Classification: Garage Services Status: Active Positional: Automatically positioned to the address Accuracy:	N	101	-	432980 409950
Contemporary Trade Directory Entries					
64	Name: Derby Dale Shirt Co Ltd Location: The Old School House, Spark Lane, Mapplewell, Barnsley, South Yorkshire, S75 6AB Classification: Shirt Makers Status: Active Positional: Automatically positioned to the address Accuracy:	N	112	-	432960 409950
Contemporary Trade Directory Entries					
65	Name: Dena System Bk Ltd Location: Unit 14, Maple Industrial Estate, Wentworth Road, Mapplewell, Barnsley, South Yorkshire, S75 6DT Classification: Machinery - Industrial & Commercial Status: Active Positional: Automatically positioned to the address Accuracy:	E	98	-	433360 409620
Contemporary Trade Directory Entries					
66	Name: G R Motors Location: Edward Street, Mapplewell, Barnsley, South Yorkshire, S75 6BL Classification: Car Body Repairs Status: Active Positional: Automatically positioned to the address Accuracy:	E	136	-	433380 409570
Contemporary Trade Directory Entries					
67	Name: M & R Precision Engineering Ltd Location: Unit 2, Courtyard 3, Wentworth Road, Mapplewell, Barnsley, South Yorkshire, S75 6DT Classification: Engineers - General Status: Active Positional: Automatically positioned to the address Accuracy:	E	136	-	433410 409680
Contemporary Trade Directory Entries					
67	Name: Aries Motor Engineers Location: Wentworth Road, Mapplewell, Barnsley, South Yorkshire, S75 6DT Classification: Garage Services Status: Inactive Positional: Automatically positioned to the address Accuracy:	E	146	-	433420 409700
Contemporary Trade Directory Entries					
67	Name: The Joshua Tree Location: Unit 16, Maple Estates, Wentworth Rd, Mapplewell, Barnsley, South Yorkshire, S75 6DT Classification: Furniture Manufacturers - Home & Office Status: Active Positional: Manually positioned within the geographical locality Accuracy:	E	151	-	433420 409660

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
67	Name: Gi-Gi Household Products Location: Unit 17a,Courtyard 3,Wentworth Road,Mapplewell,Barnsley,South Yorkshire,S75 6DT Classification: Footwear Manufacturers Status: Active Positional: Automatically positioned in the proximity of the address Accuracy:	E	164	-	433430 409660
Contemporary Trade Directory Entries					
67	Name: Flaming Hot Fires Location: Maple Leaf Ind Est,Wentworth Rd,Mapplewell,Barnsley,South Yorkshire,S75 6DT Classification: Fireplaces & Mantelpieces Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	E	178	-	433450 409680
Contemporary Trade Directory Entries					
68	Name: Oak Lodge Location: 134,Blacker Road,Mapplewell,Barnsley,South Yorkshire,S75 6DB Classification: Joinery Manufacturers Status: Inactive Positional: Automatically positioned to the address Accuracy:	NE	152	-	433390 409830
Contemporary Trade Directory Entries					
69	Name: Gail Brayshaw Location: Unit 17a,Courtyard 3,Wentworth Road,Mapplewell,Barnsley,South Yorkshire,S75 6DT Classification: Screen Process Printers Status: Active Positional: Automatically positioned to the address Accuracy:	E	158	-	433410 409590
Contemporary Trade Directory Entries					
69	Name: Transfix Location: Unit 8 The Maple Ind Est,Wentworth Rd,Mapplewell,Barnsley,South Yorkshire,S75 6DT Classification: Gearboxes Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	E	177	-	433440 409620
Contemporary Trade Directory Entries					
70	Name: Industrial Door Solutions Ltd Location: Unit 4 Mapplewell Business Park,Blacker Rd,Staincross,Barnsley,South Yorkshire,S75 6PB Classification: Door Manufacturers - Industrial Status: Active Positional: Manually positioned to the address or location Accuracy:	N	161	-	433080 410020
Contemporary Trade Directory Entries					
71	Name: R B M Ltd Location: Unit 10,Mapplewell Business Park,Blacker Rd,Staincross,Barnsley,South Yorkshire,S75 6BP Classification: Builders' Merchants Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	NE	194	-	433260 409980
Contemporary Trade Directory Entries					
72	Name: K J Spares Location: 3,Wentworth Road,Mapplewell,Barnsley,South Yorkshire,S75 6DT Classification: Motor Cycle Breakers & Dismantlers Status: Inactive Positional: Automatically positioned to the address Accuracy:	E	202	-	433470 409710
Contemporary Trade Directory Entries					
73	Name: Fireside House Location: 41,Towngate,Mapplewell,Barnsley,South Yorkshire,S75 6AS Classification: Fireplaces & Mantelpieces Status: Inactive Positional: Automatically positioned to the address Accuracy:	N	204	-	432900 410030

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
73	Name: Fireside House Location: 41, Towngate, Mapplewell, Barnsley, South Yorkshire, S75 6AS Classification: Fireplaces & Mantelpieces Status: Active Positional: Automatically positioned to the address Accuracy:	N	204	-	432900 410030
Contemporary Trade Directory Entries					
74	Name: Oakwell Resprays Location: Unit B2, Mapplewell Business Park, Blacker Rd, Mapplewell, Barnsley, South Yorkshire, S75 6BS Classification: Car Body Repairs Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	NE	208	-	433180 410030
Contemporary Trade Directory Entries					
74	Name: Radiator Services Location: Blacker Rd, Mapplewell, Barnsley, South Yorkshire, S75 6BS Classification: Car Radiator Servicing & Repairs Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	N	210	-	433160 410040
Contemporary Trade Directory Entries					
74	Name: D-Grease Ltd Location: Unit 3 North Gawber Ind Park, Blacker Rd, Mapplewell, Barnsley, South Yorkshire, S75 6BS Classification: Cleaning Materials & Equipment Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	N	210	-	433160 410040
Contemporary Trade Directory Entries					
75	Name: Gd Gaskets & Seals Location: Unit 1, Mapplewell Business Park, Staincross, Barnsley, South Yorkshire, S75 6BP Classification: Gaskets Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	N	212	-	433150 410050
Contemporary Trade Directory Entries					
75	Name: Sorted Location: Mapplewell Business Park, Blacker Rd, Staincross, Barnsley, South Yorkshire, S75 6BP Classification: Car Customizing Specialists Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	N	213	-	433120 410060
Contemporary Trade Directory Entries					
75	Name: S & S Auto Dismantlers Location: Mapplewell Business Park, Blacker Road, Mapplewell, Barnsley, South Yorkshire, S75 6BP Classification: Car Breakers & Dismantlers Status: Active Positional: Automatically positioned in the proximity of the address Accuracy:	N	223	-	433120 410070
Contemporary Trade Directory Entries					
75	Name: Electroson Location: Unit 17, Mapplewell Business Park, Blacker Road, Mapplewell, Barnsley, South Yorkshire, S75 6BP Classification: Precision Engineers Status: Active Positional: Automatically positioned in the proximity of the address Accuracy:	N	223	-	433120 410070
Contemporary Trade Directory Entries					
75	Name: Dodworth Plastics Ltd Location: Mapplewell Business Park, Blacker Road, Mapplewell, Barnsley, South Yorkshire, S75 6BP Classification: Recycling Centres Status: Active Positional: Automatically positioned in the proximity of the address Accuracy:	N	223	-	433120 410070

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
76	Name: Roy'S Autos Location: 55a,Blacker Road,Mapplewell,Barnsley,South Yorkshire,S75 6BS Classification: Garage Services Status: Active Positional: Automatically positioned to the address Accuracy:	NE	224	-	433210 410030
Contemporary Trade Directory Entries					
77	Name: Taylor Engineering & Site Services Ltd Location: 25 Greenside,Mapplewell,Barnsley,South Yorkshire,S75 6AU Classification: Wrought Ironwork Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	N	252	-	433040 410120
Contemporary Trade Directory Entries					
77	Name: Auto Class Location: 25,Greenside,Mapplewell,Barnsley,South Yorkshire,S75 6AU Classification: Classic Car Specialists Status: Inactive Positional: Automatically positioned to the address Accuracy:	N	263	-	433010 410130
Contemporary Trade Directory Entries					
77	Name: P & D Fasteners Location: 25,Greenside,Mapplewell,Barnsley,South Yorkshire,S75 6AU Classification: Nuts, Bolts & Fixings Status: Active Positional: Automatically positioned to the address Accuracy:	N	263	-	433010 410130
Contemporary Trade Directory Entries					
78	Name: The Auto Repair Centre Location: Greenside,Mapplewell,Barnsley,South Yorkshire,S75 6AU Classification: Garage Services Status: Active Positional: Automatically positioned to the address Accuracy:	N	272	-	433080 410130
Contemporary Trade Directory Entries					
79	Name: H Beachill & Son Location: 115,Towngate,Mapplewell,Barnsley,South Yorkshire,S75 6AS Classification: Road Haulage Services Status: Active Positional: Automatically positioned to the address Accuracy:	NW	286	-	432770 410090
Contemporary Trade Directory Entries					
79	Name: Gary'S Autos Location: 115,Towngate,Mapplewell,Barnsley,South Yorkshire,S75 6AS Classification: Garage Services Status: Active Positional: Automatically positioned to the address Accuracy:	NW	286	-	432770 410090
Contemporary Trade Directory Entries					
80	Name: Cleanworld Location: 387,Darton Lane,Mapplewell,Barnsley,South Yorkshire,S75 6AL Classification: Laundries & Launderettes Status: Active Positional: Automatically positioned to the address Accuracy:	NW	319	-	432660 410060
Contemporary Trade Directory Entries					
81	Name: Motec Mobile Crypton Tuning Location: 2,Ibberson Avenue,Mapplewell,Barnsley,South Yorkshire,S75 6BJ Classification: Car Engine Tuning & Diagnostic Services Status: Active Positional: Automatically positioned to the address Accuracy:	NW	342	-	432490 409900

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
82	Name: Evening Shade Blinds Location: 68, Bar Lane, Mapplewell, Barnsley, South Yorkshire, S75 6DE Classification: Blinds, Awnings & Canopies Status: Active Positional: Automatically positioned to the address Accuracy:	E	354	-	433620 409730
Contemporary Trade Directory Entries					
83	Name: Barnsley Catering Services Ltd Location: Wakefield Road, Mapplewell, Barnsley, South Yorkshire, S75 6DL Classification: Catering Equipment - Servicing & Repairs Status: Active Positional: Automatically positioned to the address Accuracy:	NE	705	-	433890 410070
Contemporary Trade Directory Entries					
83	Name: Barnsley Catering Services Location: Wakefield Road, Mapplewell, Barnsley, South Yorkshire, S75 6DL Classification: Catering Equipment - Servicing & Repairs Status: Active Positional: Automatically positioned to the address Accuracy:	NE	705	-	433890 410070
Contemporary Trade Directory Entries					
84	Name: Booth Bros Location: Wakefield Road, Mapplewell, Barnsley, South Yorkshire, S75 6DJ Classification: Garage Services Status: Inactive Positional: Automatically positioned in the proximity of the address Accuracy:	E	764	-	434030 409730
Contemporary Trade Directory Entries					
85	Name: William Freeman Ltd Location: Suba Seal Works, Wakefield Road, Mapplewell, Barnsley, South Yorkshire, S75 6DH Classification: Rubber & Plastic Products - Manufacturers Status: Active Positional: Automatically positioned to the address Accuracy:	E	776	-	434020 409910
Contemporary Trade Directory Entries					
86	Name: Oakland Location: 39, Staincross Common, Mapplewell, Barnsley, South Yorkshire, S75 6JF Classification: Garden Ornament Manufacturers Status: Inactive Positional: Automatically positioned to the address Accuracy:	N	777	-	433020 410640
Contemporary Trade Directory Entries					
87	Name: Kent Wilfred Ltd Location: Wakefield Rd, Barnsley, South Yorkshire, S71 3LU Classification: Road Haulage Services Status: Active Positional: Manually positioned to the road within the address or location Accuracy:	E	798	-	434070 409650
Contemporary Trade Directory Entries					
88	Name: J S Webster Location: 8, Bourne Court, Mapplewell, Barnsley, South Yorkshire, S75 6JB Classification: Washing Machines - Servicing & Repairs Status: Active Positional: Automatically positioned to the address Accuracy:	N	800	-	433300 410620
Contemporary Trade Directory Entries					
89	Name: Turnpike Garage (Staincross) Ltd Location: Wakefield Road, Mapplewell, Barnsley, South Yorkshire, S75 6JX Classification: Petrol Filling Stations Status: Active Positional: Automatically positioned to the address Accuracy:	NE	828	-	433450 410590

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
90	Name: Frank Walter & Sons Ltd Location: 439, Wakefield Road, Barnsley, South Yorkshire, S71 3LU Classification: Firefighting Equipment Status: Active Positional: Automatically positioned to the address Accuracy:	E	865	-	434130 409700
Contemporary Trade Directory Entries					
91	Name: Master Brew Location: 28, Moorland Avenue, Mapplewell, Barnsley, South Yorkshire, S75 6NJ Classification: Catering Equipment Status: Active Positional: Automatically positioned to the address Accuracy:	N	905	-	432590 410680
Fuel Station Entries					
92	Name: Station Garage Location: Wakefield Road, Mapplewell, BARNSELY, South Yorkshire, S75 6DJ Brand: OUT OF INDUSTRY Premises Type: Petrol Station Status: Out of Industry Positional: Automatically positioned to the address Accuracy:	E	776	-	434040 409750
Fuel Station Entries					
93	Name: Turnpike Garage Location: Wakefield Road, Mapplewell, BARNSELY, South Yorkshire, S75 6JX Brand: Jet Premises Type: Petrol Station Status: Open Positional: Automatically positioned to the address Accuracy:	NE	828	-	433450 410590

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Areas of Adopted Green Belt					
Authority:	Barnsley Metropolitan Borough Council, Planning Department	SW	0	7	432910
Plan Name:	Barnsley Unitary Development Plan				409530
Status:	Adopted				
Plan Date:	31st December 2000				
Nitrate Vulnerable Zones					
Name:	Not Supplied	-	0	8	433000
Description:	Surface Water				409610
Source:	Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)				

Data Type	Version	Update Cycle
Agency & Hydrological		
Air Pollution Controls Barnsley Metropolitan Borough Council Environmental Health and Trading Standards	September-2003	Annual Rolling Update
Air Pollution Control Enforcements Barnsley Metropolitan Borough Council Environmental Health and Trading Standards	September-2003	Annual Rolling Update
Discharge Consents Environment Agency North East Region	December-2003	Bi-Annually
Enforcement and Prohibition Notices Environment Agency North East Region	May-2004	As notified
Integrated Pollution Controls Environment Agency North East Region	January-2004	Quarterly
Integrated Pollution Prevention And Control Environment Agency North East Region	January-2004	Quarterly
Pollution Incidents to Controlled Waters Environment Agency North East Region	December-1998	Not Applicable
Substantiated Pollution Incident Register Environment Agency - North East Region Ridings Area	January-2004	Bi-Annually
Prosecutions Relating to Authorised Processes Environment Agency North East Region	May-2004	As notified
Prosecutions Relating to Controlled Waters Environment Agency North East Region	May-2004	As notified
Water Industry Act Referrals Environment Agency North East Region	January-2004	Quarterly
Registered Radioactive Substances Environment Agency North East Region	January-2004	Quarterly
River Quality Environment Agency Head Office	November-2001	Not Applicable
River Quality Biology Sampling Points Environment Agency Head Office	September-2003	Annually
River Quality Chemistry Sampling Points Environment Agency Head Office	January-2004	Annually
Water Abstractions Environment Agency North East Region	December-2003	Bi-Annually
Groundwater Vulnerability Environment Agency Head Office	December-2003	Not Applicable
Drift Deposits Environment Agency Head Office	January-1999	Not Applicable

Data Type	Version	Update Cycle
Agency & Hydrological		
Fluvial Indicative Floodplains Environment Agency Head Office	December-2003	Annually
Tidal Indicative Floodplains Environment Agency Head Office	December-2003	Annually
Source Protection Zones Environment Agency Head Office	December-2003	Variable
River Flood Data (Scotland) Centre for Ecology and Hydrology	September-1999	Not Applicable

Data Type	Version	Update Cycle
Waste		
BGS Recorded Landfill Sites British Geological Survey Information Services Group	June-1996	Not Applicable
Integrated Pollution Control Registered Waste Sites Environment Agency North East Region	January-2004	Quarterly
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - North East Region Ridings Area	December-2003	Bi-Annually
Licensed Waste Management Facilities (Locations) Environment Agency - North East Region Ridings Area	January-2004	Bi-Annually
Local Authority Landfill Coverage Barnsley Metropolitan Borough Council Environmental Health and Trading Standards	May-2000	Not Applicable
Local Authority Recorded Landfill Sites Barnsley Metropolitan Borough Council Environmental Health and Trading Standards	May-2000	Not Applicable
Registered Landfill Sites Environment Agency - North East Region Ridings Area	March-2003	Variable
Registered Waste Transfer Sites Environment Agency - North East Region Ridings Area	March-2003	Variable
Registered Waste Treatment or Disposal Sites Environment Agency - North East Region Ridings Area	March-2003	Variable

Data Type	Version	Update Cycle
Hazardous Substances		
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	May-2001	Variable
Explosive Sites Health and Safety Executive	February-2004	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November-2000	Not Applicable
Planning Hazardous Substance Consents Barnsley Metropolitan Borough Council Planning Department	October-2003	Annual Rolling Update
Planning Hazardous Substance Enforcements Barnsley Metropolitan Borough Council Planning Department	October-2003	Annual Rolling Update

Data Type	Version	Update Cycle
Geological		
BGS Boreholes British Geological Survey National Geological Records Centre	May-2004	Quarterly
BGS Recorded Mineral Sites British Geological Survey Information Services Group	October-2003	Bi-Annually
BGS 1:625,000 Solid Geology British Geological Survey Information Services Group	August-1996	Not Applicable
Brine Compensation Areas Cheshire Brine Subsidence Compensation Board	November-2002	As notified
Coal Mining Affected Areas The Coal Authority Mining Report Service	December-2003	As notified
Shallow Mining Hazards British Geological Survey Information Services Group	August-2002	Variable
Compressible Ground Subsidence Hazards British Geological Survey Information Services Group	August-2002	Variable
Ground Dissolution Subsidence Hazards British Geological Survey Information Services Group	August-2002	Variable
Gulls And Cambering Subsidence Hazards British Geological Survey Information Services Group	August-2002	Variable
Landslip Subsidence Hazards British Geological Survey Information Services Group	August-2002	Variable
Swelling Clay Subsidence Hazards British Geological Survey Information Services Group	August-2002	Variable
Mining Instability Ove Arup & Partners	October-2000	Not Applicable
Natural and Mining Cavities Peter Brett Associates Consulting Engineers	October-2001	Variable
Radon Affected Areas National Radiological Protection Board	September-1999	Not Applicable
Radon Protection Measures British Geological Survey Information Services Group	August-2002	Variable

Data Type	Version	Update Cycle
Industrial Land Use		
Contemporary Trade Directory Entries Thomson Directories	March-2004	Bi-Annually
Fuel Station Entries Catalist Ltd (Fuel Station Data)	May-2004	Quarterly

Data Type	Version	Update Cycle
Sensitive Land Uses		
Areas of Adopted Green Belt		
Barnsley Metropolitan Borough Council Planning Department	December-2000	As notified
Wakefield Metropolitan District Council	January-2003	As notified
Areas of Unadopted Green Belt		
Barnsley Metropolitan Borough Council Planning Department	December-2000	As notified
Wakefield Metropolitan District Council	January-2003	As notified
Areas of Outstanding Natural Beauty		
The Countryside Agency	October-2003	Annually
Environmentally Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	January-2004	Annually
Forest Parks		
Forestry Commission	April-1997	Not Applicable
Local Nature Reserves		
Barnsley Metropolitan Borough Council Planning Department	September-1999	As notified
Wakefield Metropolitan District Council	September-1999	As notified
Marine Nature Reserves		
English Nature	January-2004	Bi-Annually
National Nature Reserves		
English Nature	January-2004	Bi-Annually
National Parks		
The Countryside Agency	October-2003	Annually
Nitrate Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December-2003	Not Applicable
Nitrate Vulnerable Zones		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December-2003	Annually
Ramsar Sites		
English Nature	January-2004	Bi-Annually
Sites of Special Scientific Interest		
English Nature	January-2004	Bi-Annually
Special Areas of Conservation		
English Nature	January-2004	Bi-Annually
Special Protection Areas		
English Nature	January-2004	Bi-Annually

Some of the organisations who provide data which is used within the report

Ordnance Survey	 Ordnance Survey [®] Licensed Partner
Environment Agency	 ENVIRONMENT AGENCY
Scottish Environment Protection Agency	 SEPA Scottish Environment Protection Agency
The Coal Authority	 The COAL AUTHORITY
British Geological Survey	 British Geological Survey <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small> Value Added Reseller
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small>
Countryside Council for Wales	 CYNGOR CEFN GWLAD CYMRU COUNTRYSIDE COUNCIL FOR WALES
Scottish Natural Heritage	 SCOTTISH NATURAL HERITAGE
English Nature <small>Site of Special Scientific Interest, National Nature Reserve, Ramsar, Special Protection Area, Special Conservation Area, Marine Nature Reserve data (derived from Ordnance Survey 1:10000 raster) is provided by, and used with the permission of, English Nature who retain the copyright and Intellectual Property Rights for the data</small>	 ENGLISH NATURE
National Radiological Protection Board	 nrpb <small>National Radiological Protection Board</small>
Ove Arup <small>The Data provided above was obtained on Licence from Ove Arup & Partners Limited (for further information, contact mining.review@arup.com). No reproduction or further use of such Data is to be made without the prior written consent of Ove Arup & Partners Limited. The information and data supplied in the product are derived from publicly available records and other third party sources and neither Ove Arup & Partners nor Landmark warrant the accuracy or completeness of such information or data.</small>	 ARUP

Contact Name and Address

1	Barnsley Metropolitan Borough Council Environmental Health and Trading Standards Central Offices Kendray Street Barnsley South Yorkshire S70 2TN www.barnsley.gov.uk	Telephone 01226 770770 Fax 01226 772599
2	Environment Agency National Customer Contact Centre (NCCC) PO Box 544 Templeborough Rotherham S60 1BY enquiries@environment-agency.gov.uk	Telephone 08708 506 506
3	British Geological Survey National Geological Records Centre Keyworth Nottingham Nottinghamshire NG12 5GG ngis@bgs.ac.uk www.bgs.ac.uk	Telephone 0115 936 3109 Fax 0115 936 3276
4	British Geological Survey Information Services Group Kingsley Dunham Centre Keyworth Nottingham Nottinghamshire NG12 5GG www.bgs.ac.uk	Telephone 0115 936 3100 Fax 0115 936 3200
5	The Coal Authority Mining Report Service 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG thecoalauthority@coal.gov.uk	Telephone 0845 7626848 DX 716176 Mansfield 5

Contact Name and Address

6	National Radiological Protection Board Chilton Didcot Oxfordshire OX11 0RQ	Telephone 01235 831600 Fax 01235 833891
7	Barnsley Metropolitan Borough Council Planning Department Central Offices Kendray Street Barnsley South Yorkshire S70 2TN www.barnsley.gov.uk	Telephone 01226 770770 Fax 01226 772599
8	Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) Government Buildings Otley Road Lawnswood Leeds West Yorkshire LS16 5QT	Telephone 0113 2613333 Fax 0113 230 0879
	Catalist Ltd (Fuel Station Data) Richmond House 22 Richmond Hill Clifton Bristol Avon BS8 1BA Mark@catalist-uk.com	Telephone 0117 923 7113 Fax 0117 923 7166

Contact Name and Address

Landmark Information Group Limited

6 - 7 Abbey Court

Eagle Way

Sowton

Exeter

Devon

EX2 7HY

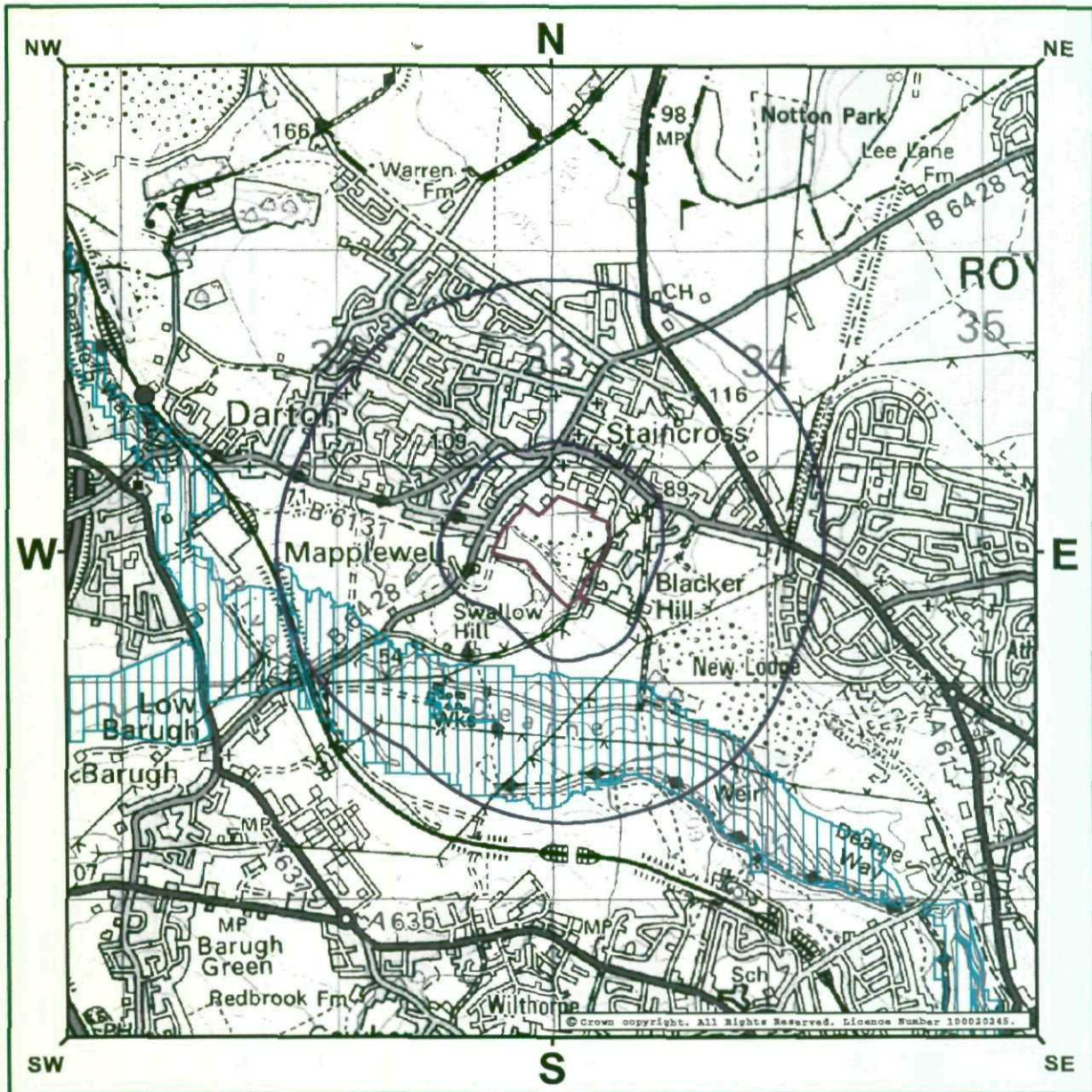
mailbox@landmark-information.co.uk

www.landmark-information.co.uk

Telephone 01392 441702

Fax 01392 441709

Please note that the Environment Agency/SEPA have a charging policy in place for enquiries



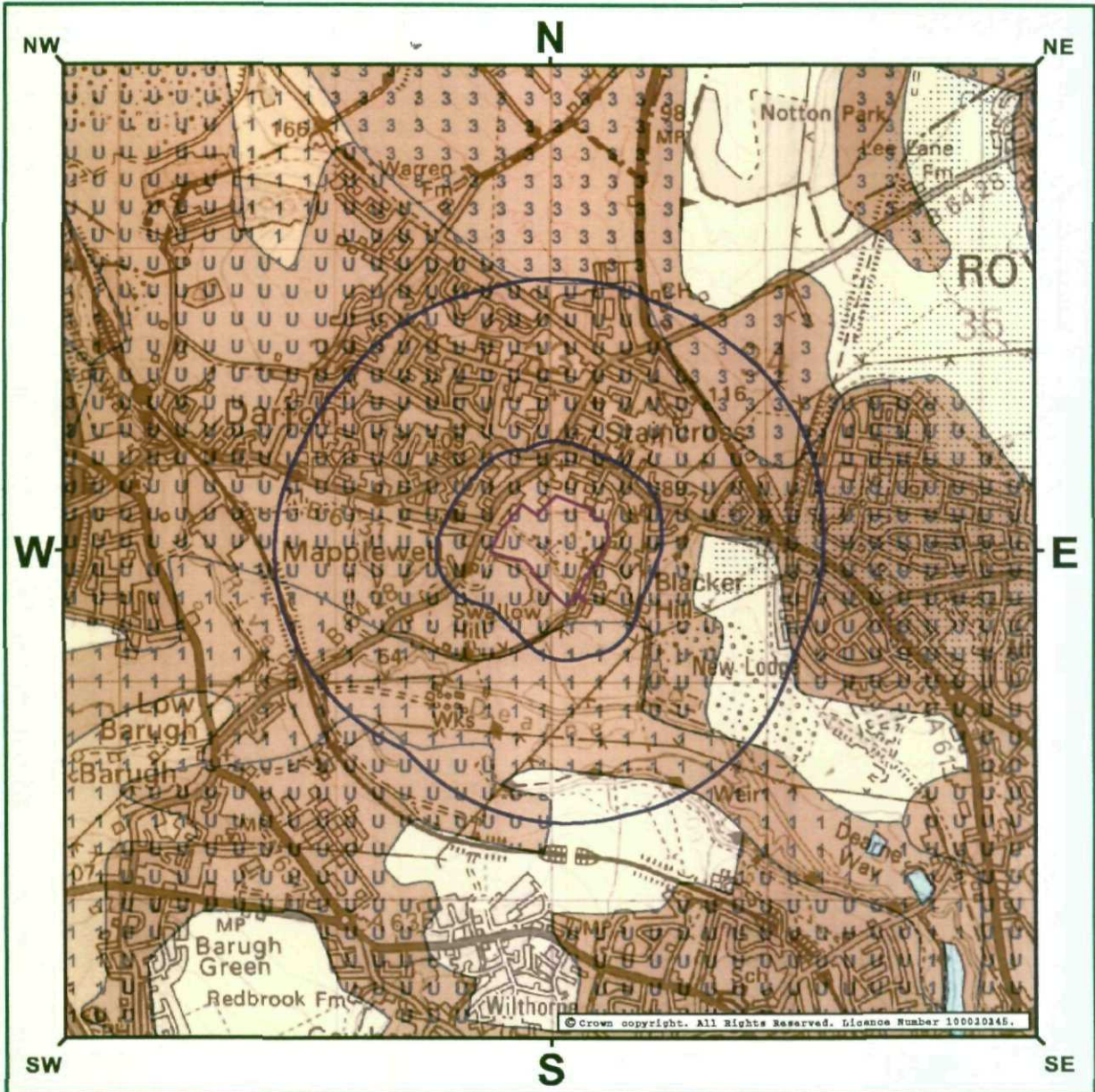
KEY

General

- △ Specified Site
- × Bearing Reference Point
- Buffer

**Agency & Hydrological
Environment Agency Indicative Floodplain**

- ▨ Indicative Fluvial Floodplain
- ▨ Indicative Tidal Floodplain



KEY

General

- Specified Site
- × Bearing Reference Point
- Buffer

Groundwater Vulnerability

Geological Classes

Major Aquifer
(High Permeable)

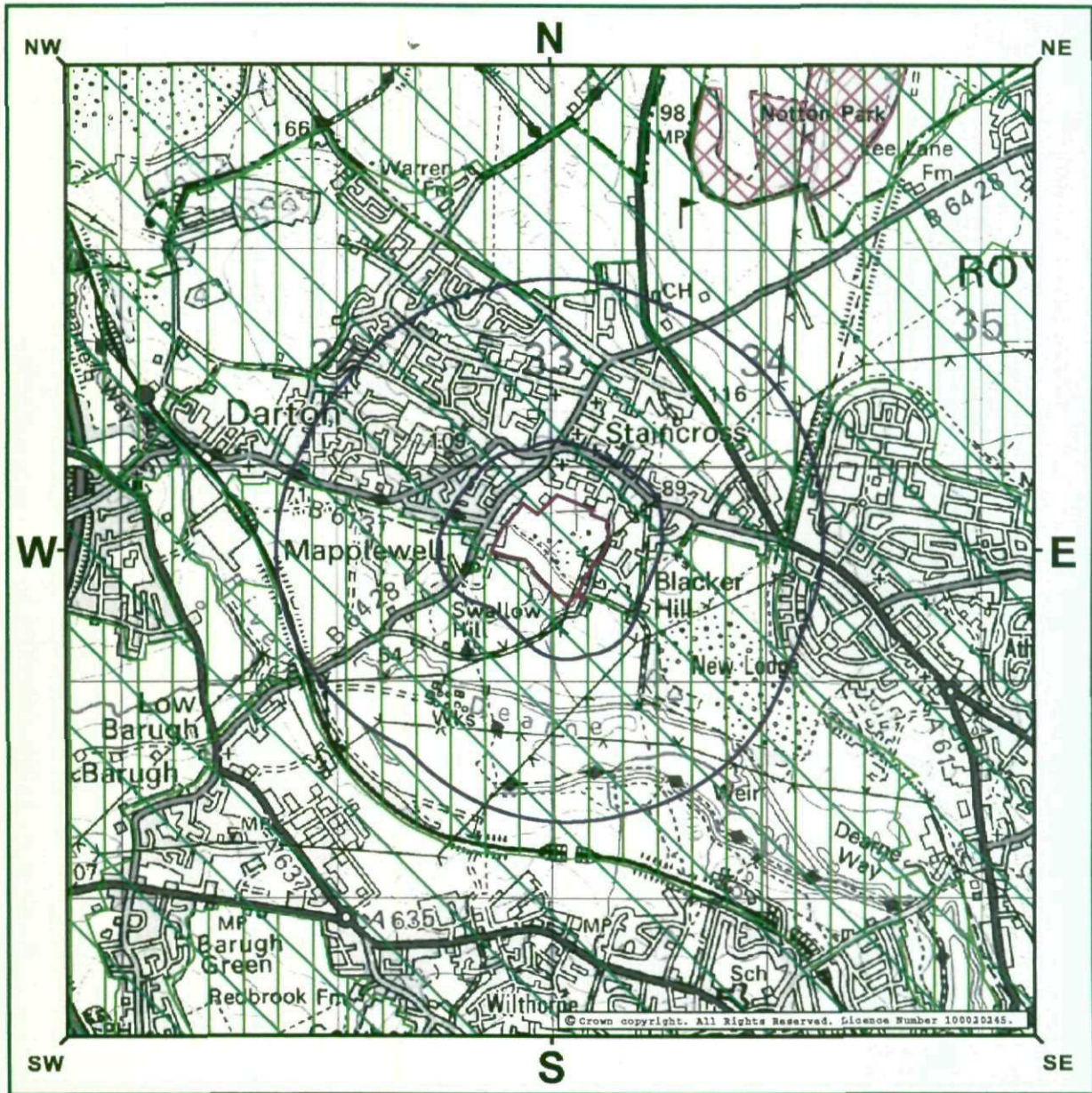
Minor Aquifer
(Variable Permeable)

Non Aquifer
(Negligibly Permeable)

Soil Classes

- High (H) 1, 2, 3, U
- Intermediate (I) 1, 2
- Low
- High (H) 1, 2, 3, U
- Intermediate (I) 1, 2
- Low

⋯ Drift Deposit



KEY

General

- △ Specified Site
- × Bearing Reference Point
- Buffer

Sensitive Land Uses

- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty

- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- National Scenic Area

- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

CLIENT DETAILS Envirocheck Order No. EC3967251_1_1

Customer Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

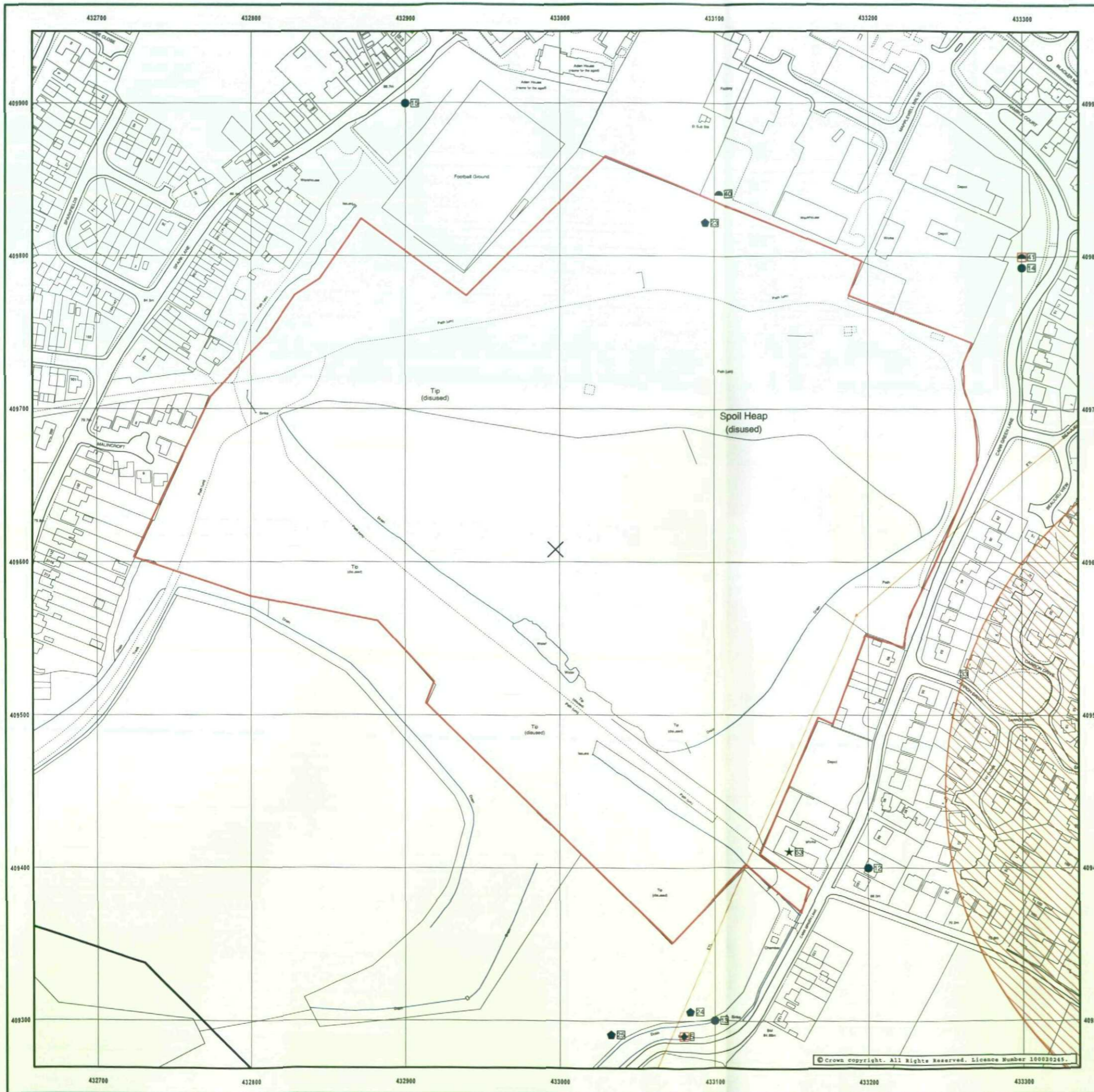
SITE DETAILS Grid Reference 433000 409610

North Gawber Colliery
 Barnsley

KEY TO THE LEGEND DATABASE

- | | |
|--|---|
| General | Waste |
| ○ Specified Site | ▼ Point Location of BGS Recorded Landfill Site |
| × Bearing Reference Point | ■ BGS Recorded Landfill Site |
| ○ Buffer (1000m) | ▲ Integrated Pollution Control Registered Waste Site |
| Ⓜ Reference Number | ■ Licensed Waste Management Facilities (Landfill Boundary) |
| □ Several of Type at Location | ● Licensed Waste Management Facility (Location) |
| | ■ Point Location of Local Authority Recorded Landfill Site |
| | ■ Local Authority Recorded Landfill Site |
| | ■ Registered Landfill Site |
| Agency and Hydrological | ■ Point Location of Registered Waste Transfer Site |
| ▲ Air Pollution Control | ■ Registered Waste Transfer Site |
| ▼ Air Pollution Control Enforcement | ■ Point Location of Registered Waste Treatment or Disposal Site |
| ● Point Location of Contaminated Land Register Entry or Notice | ■ Registered Waste Treatment or Disposal Site |
| ■ Contaminated Land Register Entry or Notice | |
| ◆ Discharge Consent | Hazardous Substances |
| ▲ Enforcement Or Prohibition Notice | ■ COMAH Site |
| ▲ Integrated Pollution Control | ■ Explosive Site |
| ■ Integrated Pollution Prevention Control | ■ NIHHS Site |
| ● Pollution Incident to Controlled Waters | ■ Planning Hazardous Substance Consent |
| ■ Substantiated Pollution Incident Register | ■ Planning Hazardous Substance Enforcement |
| ▼ Prosecution Relating to Authorised Processes | Geological |
| ◆ Prosecution Relating to Controlled Waters | ● BGS Borehole |
| ▲ Registered Radioactive Substance | ▼ BGS Recorded Mineral Site |
| ■ River Quality Sampling Point | Industrial Land Use |
| ◆ Water Abstraction | ★ Contemporary Trade Directory Entry |
| ◆ Water Industry Act Referral | ★ Fuel Station Entry |





CLIENT DETAILS Envirocheck Order No. EC3967251_1_1
(20-May-2004 10:32)
 Customer Ref: Mr A Coverdale, SDA/04014
 Scott Doherty Associates
 5, Derwentside Business Centre Consett Business Park
 Consett
 County Durham DH8 6BP

SITE DETAILS Grid Reference 433000 409610
 North Gawber Colliery
 Barnsley

KEY TO THE LEGEND DATABASE	
General	Waste
○ Specified Site	▼ Point Location of BGS Recorded Landfill Site
× Bearing Reference Point	▨ BGS Recorded Landfill Site
○ Buffer (250m)	▲ Integrated Pollution Control Registered Waste Site
Ⓜ Reference Number	▨ Licensed Waste Management Facilities (Landfill Boundary)
□ Several of Type at Location	● Licensed Waste Management Facility (Location)
⚡ Pylon	■ Point Location of Local Authority Recorded Landfill Site
— Overhead Transmission Line	▨ Local Authority Recorded Landfill Site
	▨ Registered Landfill Site
Agency and Hydrological	■ Point Location of Registered Waste Transfer Site
▲ Air Pollution Control	▨ Registered Waste Transfer Site
▼ Air Pollution Control Enforcement	■ Point Location of Registered Waste Treatment or Disposal Site
● Point Location of Contaminated Land Register Entry or Notice	▨ Registered Waste Treatment or Disposal Site
▨ Contaminated Land Register Entry or Notice	
◆ Discharge Consent	Hazardous Substances
▲ Enforcement Or Prohibition Notice	✱ COMAH Site
▲ Integrated Pollution Control	✱ Explosive Site
■ Integrated Pollution Prevention Control	✱ NIHHS Site
● Pollution Incident to Controlled Waters	✱ Planning Hazardous Substance Consent
● Substantiated Pollution Incident Register	✱ Planning Hazardous Substance Enforcement
▼ Prosecution Relating to Authorised Processes	
◆ Prosecution Relating to Controlled Waters	Geological
▲ Registered Radioactive Substance	● BGS Borehole
— River Network or Water Feature	▼ BGS Recorded Mineral Site
⊕ River Quality Sampling Point	Industrial Land Use
◆ Water Abstraction	★ Contemporary Trade Directory Entry
◆ Water Industry Act Referral	★ Fuel Station Entry

APPENDIX C

COPY OF BRITISH COAL'S DESK STUDY REPORT (1990)

172,16(199)

Desk Top Study of Possible
Opencast Site at Gawber

Approved by:



Dr W C Pearce
Head of Chemistry

Distribution:

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Surface Environment File

Ref: LW/AM

December 1990

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1. INTRODUCTION

This study is of a part of Yorkshire which in the mid 19th Century was primarily given over to textiles and small mining concerns. Prior to this, industry had been semi-domestic, usually glass or nailmaking. However, in the latter part of the century with the arrival of the railways, mining became the dominant industry. Coalmining was largely in the hands of the land-owning class and some collieries were composite undertakings, ie, with coke oven plants or brickyards, attached.

The following industries/activities have been examined:

	<u>Location on Main Map</u>
Mining developments	(sites 1/2/8/9/16/18)
Coking/Chemical/Bleach Works	(sites 6/12/16/17/22)
Tip and Spoil Heaps	(sites 3/4/5/11/13/14/20/23/24/25/26/27 /28/29)
Water Courses	(sites 7/10)
Sewage Works	(sites 15/19/21)

2. MINING

There have been four collieries within the area of interest and three of any size outside. The former are:

2.1 North Gawber Colliery and Coke Works (Grid ref: 333 098)

There has been mining at North Gawber since 1849 and during the latter half of the 19th Century coke and gas were also produced. Dearnley (History of Darton) quotes this colliery as closing in 1922. A new North Gawber Colliery opened in 1926, was extended in 1949 and eventually closed in 1988 after merging with Woolley Colliery.

During the lifetime of the 'old' colliery, 82 beehive ovens were used to produce 550 tons of blast furnace coke per week. Both coal and coke were transported by rail to join the Lancashire and Yorkshire Railway near Darton.

It is assumed that any by-products from carbonisation would have been processed at one of the nearby chemical works. Since Barugh Green Chemical Works was not operational until 1912, the Yorkshire Tar Distillers at Stairfoot is the more likely. The latter was sited at the junction of rail lines from several collieries.

2.1.2 Contamination

Areas of concern would be the mineral railway (now mostly dismantled), the tip (site 13 on main map) and tanks and pipework. Some likely contaminants are PAHs, phenols, sulphates and cyanides.

2.2 East Gawber Hall Colliery and Coke Works (Grid ref: 345 088)

East Gawber Hall opened, with ancillary coking plant, in 1855 and closed in 1921. The 1906 map (Appendix 1) shows a route for waste material under the railway line to an area south east of Standhill Wood (9a on main map). The map identifies the oven sites but does not mark storage tanks, etc. The 1931 map (Appendix 2) shows no trace of the colliery other than the waste heaps.

2.2.1 Contamination

It is possible that tanks containing waste tar are buried at site 9a on main map. As with similar sites, pipework (if still in existence), tanks, railway sidings and waste heaps are areas of concern. Likely contaminants would be PAHs, phenols and other organics as well as sulphates and cyanides.

Asbestos from lagging is also a possible contaminant if demolition waste was disposed of into nearby tips.

2.3 Wharncliffe Carlton Colliery and Coke Works (Grid ref: 347 064)

Kelly's 1889 edition lists Wharncliffe Carlton and East Gawber Hall Collieries as being in the ownership of R Craik & Co. The 1906 map (Appendix 1) gives the layout of the coke ovens and waste heaps. By 1931 (Appendix 2), demolition is more or less complete. It is possible that in its later years this colliery became part of the Wharncliffe Woodmoor group. According to British Coal's Mines Records, this colliery closed in 1921. As with North and East Gawber, it is assumed that tar would be processed at Stairfoot.

2.3.1 Contamination

As East and North Gawber collieries.

2.4 Darton Colliery and Mapplewell Brickworks (Grid ref: 323 096)

The 1906 map (Appendix 1) shows an adit and tramways. Shafts were finally sunk in 1910 and the colliery appears to have been worked in conjunction with the Mapplewell Brick Works. Both would have made use of the North Gawber Railway. Clay pits at Belle Vue (where there was also mining in a small way), supplied raw material for the Brickworks. The colliery was also known as Swallow Hill. According to Mine Records, Darton Colliery merged with the North Gawber complex (date unknown).

2.4.1 Contamination of this site is unlikely.

Outside the main boundary are:

2.5 Primrose Main Colliery (Grid ref: 348 085)

The 1906 map (Appendix 1) shows a colliery adjacent to Wharncliffe Carlton and intersected by the railway. The 1932 map (Appendix 2) shows only the spoil heaps remaining. This research has uncovered no other reference to this colliery.

The area is now occupied by a tarmacadam works (site 22).

2.6 Redbrook Colliery (Grid ref: 328 079)

Sunk in 1903, the Redbrook Colliery was sold to the Church Lane Co of Dodworth and connected with the Church Lane Colliery. There was also a link with the Old Silkstone Colliery which was also known as 'Church' or 'Dodworth'. Redbrook closed in 1988 after merging with Woolley.

2.7 Old Silkstone Colliery (Grid ref: 317 085)

The Colliery was sunk in 1862 and expanded in 1912 to include a coking and by-products plant (see 3.1). The chemical works closed in 1958 and further mining activity was merged with that of Woolley Colliery.

2.8 Other Mining

Small mining concerns proliferated throughout the area. Appendix 6 is marked where there is any evidence of mining whether via shaft, adit, bell pit or dayhole. In addition, there are no doubt many other instances of mining of which there is no record.

3. CHEMICAL WORKS

3.1 Barugh Coking and By-product Plant (Grid ref: 318 084)

Also known as Dodworth Coking Plant, the name within the coking industry was given as the Old Silkstone Collieries. The plant operated between 1912 and 1958 and produced around 200,000 tons of coke annually. The by-product list included tar, sulphate of ammonia, benzole, toluol, creosote, naphtha and refined benzol.

3.1.1 Processes

The basic process of carbonisation involved heating coal in an oxygen-deficient atmosphere to produce a mixture of gaseous and liquid products and coke as the solid residue.

The volatile materials would be separated producing an impure gas mixture, ammonia liquor and tar. Following further purification, the gas would be stored and distributed and the ammonia liquor and tar would be processed as required.

3.1.2 By-products

Tar - mostly used in primary condition, ie, road tar, pitch for briquetting and creosote but would also be processed to produce feedstocks for the chemical industry.

Benzole - a primary product both from tar distillation and by direct removal from gas. Benzole from tar distillation required pre-treatment with acid (40% sulphuric acid) to remove pyridine bases and alkali (6-12% sodium hydroxide) to remove phenols. Alkaline wash (to remove hydrogen sulphide) and preliminary distillation (to remove carbon disulphide) would be used for removal of inorganic sulphur.

The process of removing other sulphur compounds by washing benzole with concentrated sulphuric acid would also result in the production of waste acid tars. Such materials are particularly hazardous and would require an on-site neutralisation.

Sulphur free benzole would then be further refined by fractional distillation to produce benzene, toluene, xylene solvent and naptha.

Ammonia - ammoniacal liquor would be heated, resulting in the decomposition of ammonium carbonate and sulphide and the release of free ammonia. Fixed ammonia would be freed by distillation with strong alkali (calcium hydroxide suspension). The steam-ammonia mixture entered a saturator containing sulphuric acid in which ammonia would be absorbed and from which solid ammonium sulphate separated. Excess steam, carbon dioxide and hydrogen sulphide passed from the saturator through heat exchangers and condensers where the condensed water dissolved compounds such as phenols, hydrogen sulphide, etc. The condensate would be returned for re-distillation, or waste liquor treated.

3.1.3 Contamination

Contamination caused by coal tars, spent oxides, etc, would be likely in tanks, pipeworks and railway sidings (where materials were transported), as well as in areas of waste disposal. Since it is possible that tar, etc, from the Coalite Works would be processed at the By-Products Plant, then further contamination of the railway up to Silkstone junction must be considered. Typical contaminants would be PAHs and other organics as well as sulphates and cyanides. The presence of acid tars, as already mentioned, is cause for concern and would require on-site neutralisation.

Contamination of the bed of the Barnsley canal by effluents discharged to drain is also possible.

3.1.4 Other Industries On Site

- i) Adjoining was the Yorkshire Electric Power Co which used the surplus gas from the coke ovens. This is now the Electricity Sub Station.
- ii) The Waste Heat Co also generated electricity from surplus gas.
- iii) The Sensible Heat Distillation Co attempted to patent new by-products from coal but were bankrupted in 1933, after six years of operation.

3.1.5 Photographs

A number of photographs on the site taken during construction of the plant during 1911 and 1912, are included in Appendix 5.

3.2 Barugh Coalite Works (Grid ref: 323 084)

Dearnley refers to the works as opening around 1907 but other references give the date as 1913. In 1917 the company was bought by Low Temperature Carbonisation Ltd and in 1926 was re-organised and re-built. In 1927 production was 100,000 tons per annum. By 1937 the company, grossly overstocked, built railway sidings across the footpath from Swallow Hill to the Day House and stored large quantities of fuel in fields (this area is currently opencast workings). The plant closed in 1939. During the war the fuel stocks were sold but the plant was not re-opened.

3.2.1 By-products

The yield of tar from low temperature carbonisation is usually 2-3 times higher than that produced at high temperature, although the pitch content is relatively low.

The oils produced are of a mixed chemical nature since they are paraffinic, aromatic and naphthenic. They mix well with petroleum oils and do not crystallise at low temperatures. It was because of these virtues that contracts with the Air Ministry (aviation fuel) and the Admiralty were given in 1933.

3.2.2 Contamination

Contamination would differ in some respects from that found at coking sites as low temperature carbonisation results in tars with a higher content of phenolics. In respect of areas of contamination, the same general rules apply.

The presence of a drain to the Barnsley Canal would extend the area of possible contamination to the bed of the canal.

3.3 Specialised Aerosol Co Ltd (Grid ref: 333 095)

The company produces aerosol cans of cleaning and maintenance products using a wide variety of organic and inorganic compounds. These include, acids, alkalis, descalers, solvents (some chlorinated), disinfectants, surfactants, lubricants and anti-freezes.

The company has been operating since 1976 at least, as planning permission for a storage building for chemicals was then granted. Chemicals are not manufactured on site but bought in, made up and canned. This site would be of concern if there had been any instances of spillage or evidence of inappropriate handling.

3.4 Vitriol Works

The information provided by Emma Pearce-Jenkins in her study of Gawber is:

'There were two vitriol or acid works in this area during the nineteenth century but both had closed down by the beginning of the twentieth century - Swallow Hill vitriol works (ref 324094) and Staincross vitriol works (ref 334098). These works were likely to have provided acids for the bleaching processes, which were carried out in connection with the linen trade which was flourishing during the mid 1800's. Also hydrochloric acid would have been supplied to the local metal works and foundries for cleaning processes, etc. This process would have utilized the spent oxide produced as a by-product of gas purification processes - the coal gas produced would have been purified by passing it through iron oxide in order to remove a large percentage of the impurities sulphur and cyanide compounds. The spent oxide which results is rich in sulphur. It is then roasted at the vitriol works to produce sulphur dioxide which, with water, forms sulphuric acid - this is then used in the manufacture of chlorine bleaches. Waste products will have included: pitch/tar (loaded onto barges on the canal during the 1870's) and phenols also acid residues, heavy metals, eg, lead, arsenic and, with leaching from spent oxides - cyanide and sulphate'.

NB: The Swallow Hill vitriol works site was subsequently used as a landfill site (see section 4.2.2). The Staincross site has subsequently been overlaid by North Gawber Colliery's Coal Stocking and Home Delivery Yard.

3.5 Bleach and Dye Works

Emma Pearce-Jenkins states the following:

'Within the Barnsley area the textile industry was very important in

the 19th Century and a number of Linen works, often referred to as Bleach Works were situated in this study. Redbrook (Grid ref: 326 078) and Greenfoot (Grid ref: 338 082) were two works within the area.

Originally the linen produced at these works was bleached on bleaching greens using such substances as sour milk and pigeon droppings. By the beginning of the 19th Century some weak acids were being used, the actual bleaching powders (calcium hypochlorite or slaked lime saturated with chlorine) took several years to come into common use. Due to its elevated price many continued to use traditional bleaching methods.

Greenfoot closed sometime in the early 20th Century but Redbrook, after a reprieve in the 1920's, was one of the last Linen works to survive finally closing in the 1950's. In Bretton's account these works consisted of Yarn sheds, boiling pans, dye houses, troughs and dressing sheds.

These works produced their own gas on site and therefore there will be the potential contamination spots where this was produced, ie, coal tar, phenols, cyanides, etc. Greenfoot's gasometer is marked clearly on the map but no other reference is made. Bretton refers to Redbrook's gasometer being in the plantation where gas 'was made for use in the mill and properties', however no other reference has been found to support this.

Contamination on the older sites is less likely than at Redbrook where more modern techniques in dyeing and bleaching may have left contamination'.

NB:

It would appear that the grid reference for the Redbrook site has been mis-typed. This should read 320 078.

3.5.1 Processes in bleaching and dyeing

Yarn would be bleached using soda ash, chlorine and weak sulphuric acid in a series of steps and then dyed.

Dyes in common use at the time Redbrook was operating were:

- i) Acid (especially used for wool and protein fibres)
- ii) Azoic (fast colour dyes for cotton and linen)
- iii) Basic (hydrochloride dyes, use of which was latterly restricted because of poor 'fastness'. They were however sometimes used to 'top' up the brightness of other dyes)
- iv) Mineral pigments (of restricted use, usually for khaki dyes)
- v) Mordant dyes (among the oldest dyes the most common of which is Alizarin)
- vi) Sulphur dyes (a very important cotton dye)
- vii) Vat dyes (indigoid or anthraquinonoid)

In addition to the dyes a number of 'assisting' chemicals would be used, eg, glauher salts (sodium sulphate), sodium hydrosulphite, sodium chlorate, acid and alkalis.

Since there is evidence of the mill producing uniforms and other Services materials during the war, we can assume that both mineral pigment and vat dyes were used.

* It is possible that some of the dye chemicals used at Redbrook were carcinogenic.

3.6 Tarmacadam Works (Grid ref 348 085)

The works is on the site on the old Primrose Main Colliery. It may be that it originally functioned as a by-product plant, possibly for processing of tars from coking collieries along the railway route. It has been referred to as being owned by Hinchcliffe's (or Inchcliffe) and then Wards. Regional Drawing 05/11996 (Appendix 9) shows the works adjacent to Tilcon Concrete Works and possibly working in conjunction with it.

Tarmac is produced by the mixture of tar with sand and gravel.

This site would be of concern if there were any evidence of spillage onto the site, either along the nearby dismantled railway or down the embankment to the north.

3.7 British Benzol (Grid ref: 318 083)

The company buys base oils in bulk and blends and cans for re-sale. A planning application has been submitted for extensive warehousing and additional storage tanks. Since there is no manufacturing on site there is little product waste.

4. TIPS AND SPOIL HEAPS

There are a number of spoil heaps, landfill sites and transfer stations in the area.

4.1 Tips Associated with Mining

4.1.1 North Gawber Tip (sites 13 and 14 on main map)

The tip area surrounds the Mineral Railway and is no longer in use. Prior to closure, North Gawber merged with Woolley

Colliery and coal and spoil were processed at Westside Coal Preparation Plant. The area east of Spark Lane (site 14) has been unused since 1965 and subsequently re-claimed. Part of the tip, east of Carr Green Lane was the Coal Stocking and Home Delivery Yard and was previously the site of the Staincross Vitriol Works. This part of the tip may be contaminated (see Section 3.4).

4.1.2 North Gawber Hill End Tip (site 11 on main map)

An extensive, conveyor and roadway fed spoil heap which was made redundant by use of Westside facilities.

Discard was conveyed from the washery but dredged tailings brought by dumpers, deposited in tailing drying areas and then overtipped.

Sections of the tip were opencasted in 1952/3. The Two Foot, Winter, Kilnhurst and Beamshaw seams were worked then the area restored. Plan ref NG 113/3/D shows the extent of opencast workings. In 1977 Winter, Top Beamshaw and Low Beamshaw seams were worked by opencast. Some of the overburden filled the disused railway cutting to the North. Because of extensive opencasting the greater part of the spoil heap rests on backfill.

Tipping ceased in 1985.

4.1.3 Darton Colliery Tip (site 4 on main map)

Darton Colliery spoil heap has been reclaimed. To the north and north east (either side of Cockshot Pit Lane), are two smaller sites which had been used as coal stocking areas by North Gawber Colliery.

4.1.4 Redbrook (site 24 on main map)

Assumed to be the spoil heap from Redbrook Colliery and to be uncontaminated.

4.1.5 Wharncliffe Carlton Tip (site 8 on main map)

Since this disused tip was once part of Wharncliffe Carlton Colliery and Coke Works there may be the degree of contamination associated with industry of this type (see 2.1.2).

4.2 Other Sites

4.2.1 Whaley Road (site 28 on main map)

Around this areas there are three landfill sites for the disposal of inert and non-hazardous waste. One of the sites is operated by Bayford Explorations who worked the opencast site across the railway. There has been an instance of illegal tipping which has been assumed to have been inert by the Opencast Executive's own research with Yorkshire Hazardous Waste Unit.

4.2.2 Spark Lane Quarry (site 26 on main map)

The quarry has been filled with inert waste and reclaimed. However it should be noted that the Swallow Hill Vitriol Works was sited next to the quarry and that associated contamination may be present (see Section 3.4).

4.2.3 Shaws Carpets

A landfill site for waste arising from the factory, ie, non-hazardous industrial and construction/demolition waste.

An amendment to the original licence allowed disposal of small quantities of asbestos. Since the site has been operational since 1967 (prior to the Control of Pollution Act) no assumptions can be made as to the content of this site. It would be prudent to treat this area as contaminated.

4.2.4 Blackerhill Quarry (site 23 on main map)

Operated by Blackerhill Quarry for the disposal of hardcore and builders rubble together with non-hazardous combustible waste. Permission was given for excavation of fuel ash.

4.2.5 Transfer Station, Wentworth Road (site 29 on main map)

Although this station was only to hold inert and non-hazardous waste, the licence was revoked in 1988 because of the inclusion of asbestos. The licence has been transferred but the whereabouts of the asbestos is unclear. This area should be considered contaminated.

4.2.6 Dumpit Site (site 20 on main map)

This is a public tip operated by Barnsley Metropolitan Borough Council (BMBC).

4.2.7 Industrial Estate Tip, Redbrook (site 27 on main map)

This is a landfill site operated by Tara Civil Engineering for disposal of inert waste. Although the site seems to have been correctly operated with regard to the nature of the waste, some tipping in an unapproved area resulted in the issue of a warning.

5. Water Courses

5.1 The Barnsley Canal

The Barnsley canal is a section of the Aire and Calder Canal which was built to exploit the coalfields around Silkstone and worked for almost 150 years. Coal and grain appear to have been the main cargoes although Emma Pearce-Jenkin refers to carrying of flax, burned lime and limestone pitch.

The combination of an expanding rail network and the decline of canal side collieries dealt a serious blow to the canal and repeated subsidence damage led to its closure in 1953. The canal is now in poor condition with only some sections still in water although the towpath is in relatively good condition.

The Barnsley Canal Group mentioned the possibility of old barges being sunk near the former wharf by Willow Bank (approximate Grid ref 342 081). This could be of concern if cargoes of pitch etc were present.

5.1.2 Water Quality

The canal water quality is monitored at a number of points as part of the River Dearne survey carried out by Scientific Services. Full details of this survey will be included at Stage II but it must be stated that a large quantity of lubricating oil was registered at points 11 and 12 during October 1990. Appendix 11 shows monitoring sites.

Past discharges from Barugh Chemical Works and the Coalite Works may have contaminated the canal bed by Barugh.

5.2 The River Dearne

The river flows from west to east across the site in a convoluted manner. Immediately upstream is Woolley Colliery and the Shaw Carpet factory. The river enters the area of primary interest at Barugh Bridge.

River quality is extremely poor and would appear to be substantially damaged by effluents from various industries. Scientific Services have monitored the river at a number of points, as part of the River Dearne survey, since March 1990. Full details of the survey will be included in Stage II but it should be noted that the Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) increase unexpectedly between points 8 and 9. This is after clearing from the Swallow Hill sewage works and indicates a contaminating source other than the Swallow Hill Works.

5.2.1 Consents to discharge

- i) Yorkshire Water Authority
Carr Green Lane
Mapplewell (Grid ref: 330 092)
Limits are restricted to the size of solids and rate and type of flow.

- ii) Yorkshire Water Services
Darton Lane Surface Water Sewer
(Grid ref: 319 091)
No precise limits given.

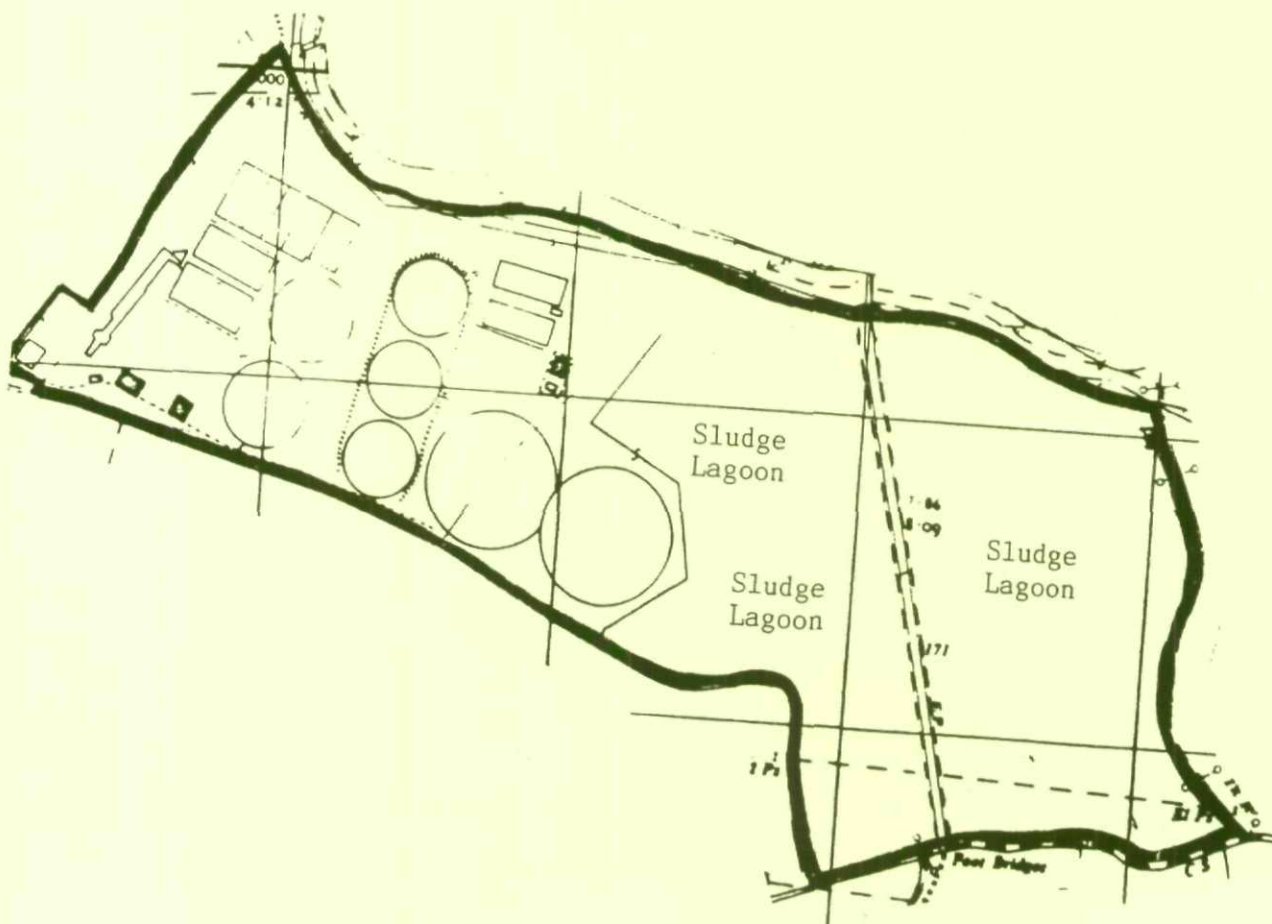
Because of the lack of precise limits, details of contraventions are difficult to establish.

6. OTHERS

6.1 Swallow Hill Sewage Works (Grid ref: 327 089)

The sewage works has been operational since 1898 with some alteration to the layout over the years (1931 edition, appendix 2). The plan below shows the current, approximate boundary, intersected by a footpath.

Treatment of raw sewage is by aeration and filtration resulting in separation of solid and liquid waste. Liquid effluents are discharged to the River Dearne, whilst the sludge is put to beds to dry. Dried sewage sludge can be sold as fertiliser. On a visit to the site in November, it appeared that there had been a fire across the area east of the footpath.



6.1.1 Contamination

Persistent tipping of sludge to a particular area over a number of years will result in biological contamination of that area as well as contamination by heavy metals, arsenic etc.

6.1.2 Effluents

The NRA monitor the river at a point upstream of the sewage works but have not provided details of downstream monitoring. The River Dearne Survey (Scientific Services) monitors water quality at several points around the works. Further information concerning discharges are being pursued with the NRA.

6.2 Barnsley Canister Co Ltd

Barnsley Canisters is sited to the north of Specialised Aerosols and produces embossed and lithographed metal containers.

Typical wastes from this site would be from metals, oils and dyes.

7. USES AND RESTRICTIONS

7.1 This research has uncovered no evidence of ancient monuments. Barugh Bridge (Grid ref: 321 901) is listed and as such will be subject to consent. In addition, there are several buildings designated as 'of interest' although not listed. These are Swallow Hill Farm, Hill End Farm and several houses in Carr Green Lane.

7.2 The area around Willow Bank has been designated a Site of Scientific Interest. This means that there is no statutory requirement to protect the site but that the local Council will oppose any development/activity which may damage the site.

8. MISCELLANEOUS

A single building identified as Redbrook Steelworks was mapped on Regional Drawing OS/11996 (Opencast Executive). British Steel Records Office has no record of this site. It is assumed that the building has been a storage facility for steelworks within the locality.

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Barnsley Local Plan - Barnsley Metropolitan Borough Council, 1983

The Barnsley Canal - a forgotten waterway? - The Barnsley Canal Group

Study of Licensed waste tips (CNSW/PL2007) Opencast Executive

APPENDIX 1

1906 Edition

- i) East Gawber Hall Colliery
- ii) Primrose Main Colliery
Wharncliffe Carlton Colliery
- iii) Greenfoot Bleach Works
- iv) Darton Colliery & Mapplewell Brickworks
- v) Swallow Hill Sewage Works

Hill Top

20
9 882

20a
.610

268

5 293

To Primary
F.P.
65

Coke Ovens

Coke Ovens

W.M.

17
22 668

18
303

2
379

3

East Gawber Hall
Colliery

G.C.R.

COAL RAILWAY EXTENSION

16
2 357

4
12 037

CCLXXIV

Primrose Main
Colliery

7
7 530

6
4 896

10
4 918

12 822

47

Wharnciffe
Carlton Colliery

Coke Over

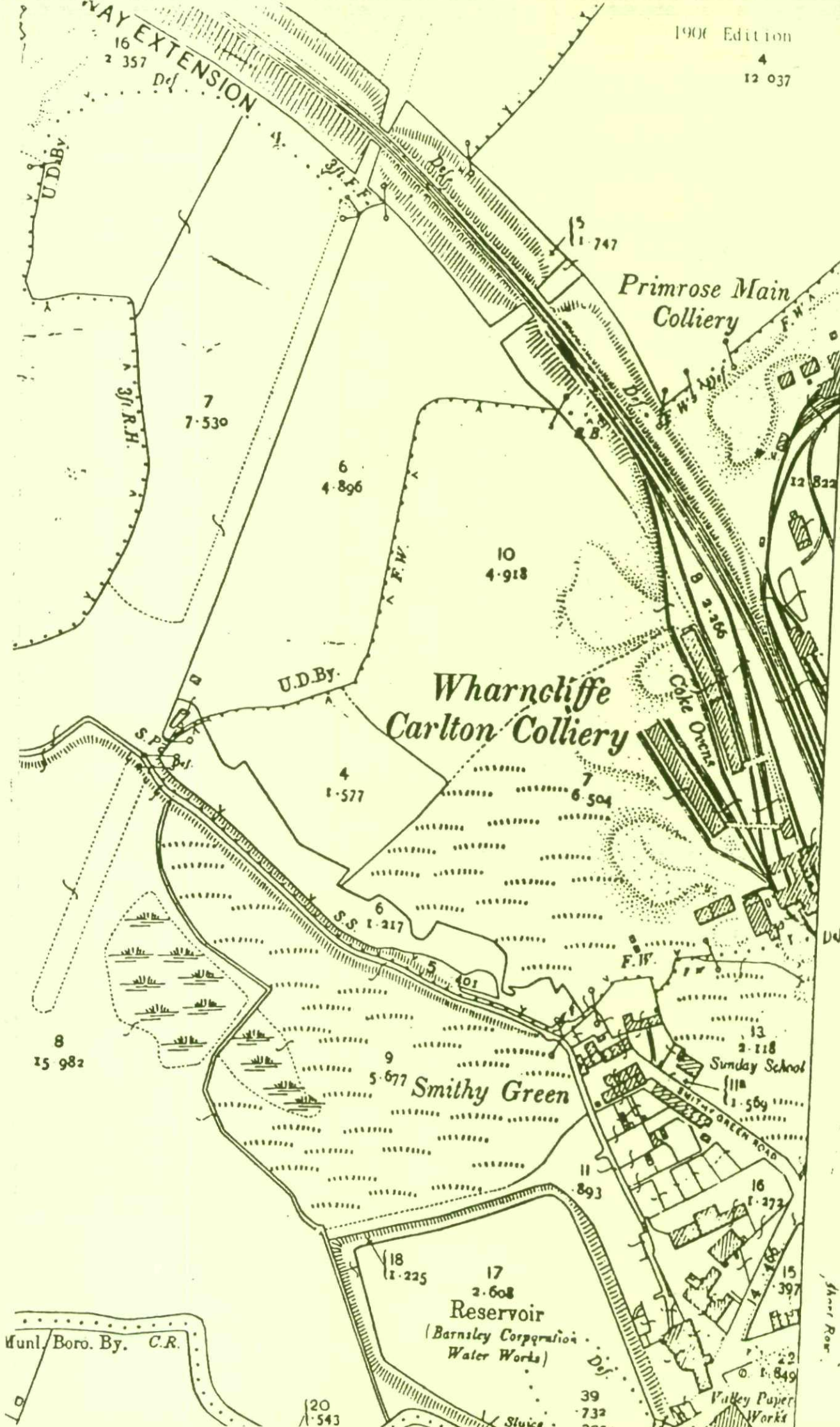
U.D.By.

7a
244

MONK BREITON T.D.

BARNSELEY R.D.

CARLTON P.H.



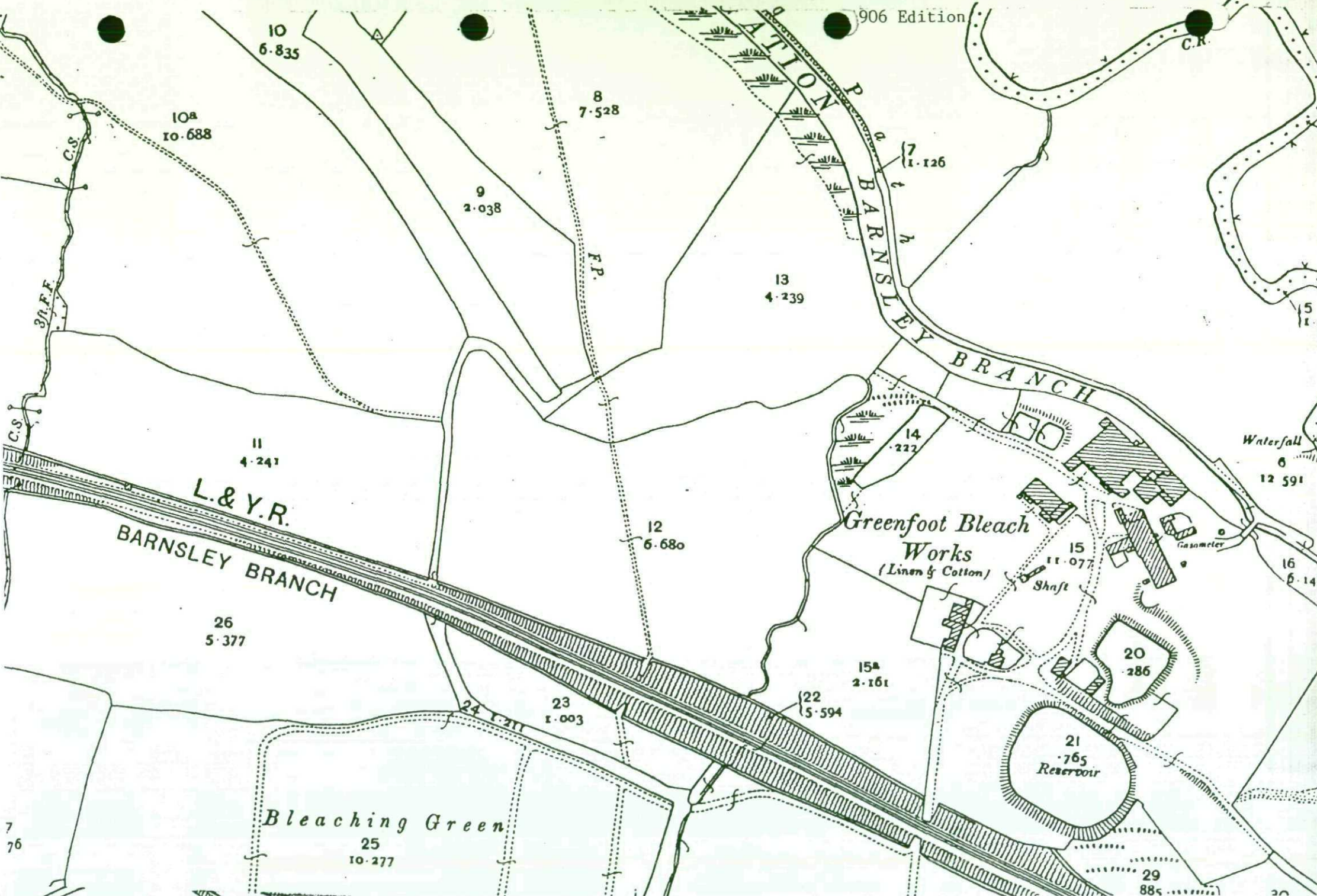
BARNLSLEY R.D.

CARLTON P.H.

Smithies

Sluice

Munl. Boro. By. C.R.



10
6.835

10a
10.688

8
7.528

9
2.038

13
4.239

7
1.126

11
4.241

14
2.22

Waterfall
6
12.591

L. & Y.R.

12
6.680

Greenfoot Bleach
Works
(Linen & Cotton)

15
11.077

16
6.148

BARNSELY BRANCH

26
5.377

Shaft

20
286

15a
2.161

22
5.594

21
765
Reservoir

23
1.003

24
1.211

29
885

Bleaching Green

25
10.277

7
76

191
6 124

198
10 800

Darton Lane

196
2 481

T

Stone B M 2601

126
3 931

125
3 970

253

263

197
3 561

N

273

128
73

106a
4 394

124a
1 075

NORTH

122
617

Belle Vue Cottages
118
1 042

119
299

116
968

GAWBER

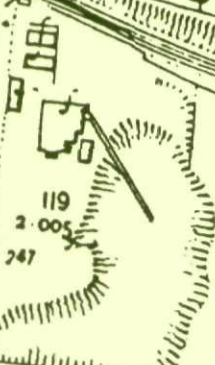
127
9 461

124
3 613

Mapplewell
Brick Works

123
1 076

R M 2547



115
1 557

Darton Colliery

121a
1 047

123a
1 349

Air Shaft 3 677

Cockshol Pit Lane

5 326

106
5 406

123b
815

120
672

121 242
1 186

D.

112
3 381

107
6 288

8 589

2 957

2 969

3 578

3 563

105

108

109

110

56

inches to a Statute Mile or 208.33 Feet to One Inch.

20

25

30

35

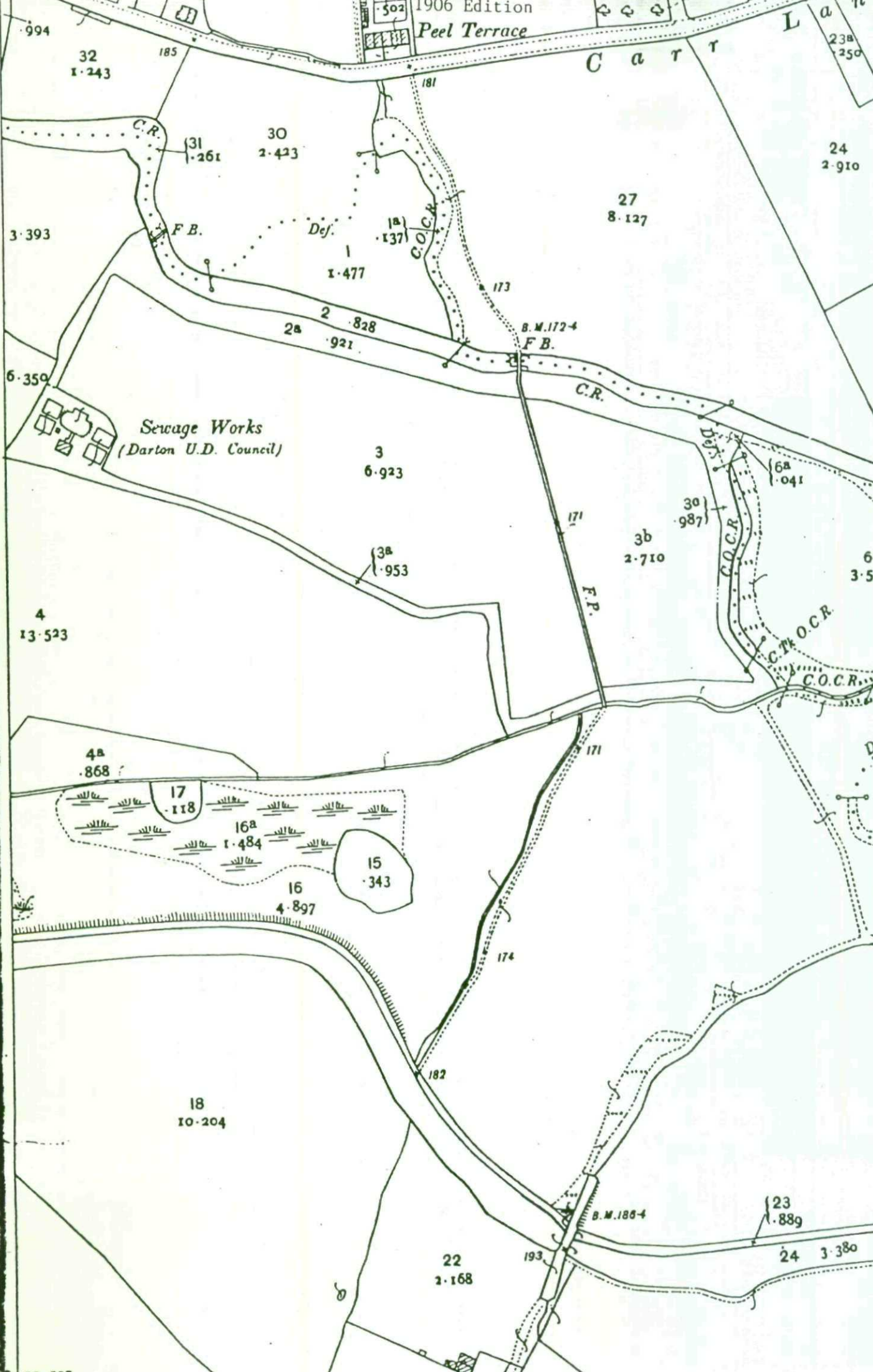
PRICE 3/-

1500

2000

40 Chains
Statute Mile
2500 Feet

and Track or Footpath is no evidence of the existence of a right of way.



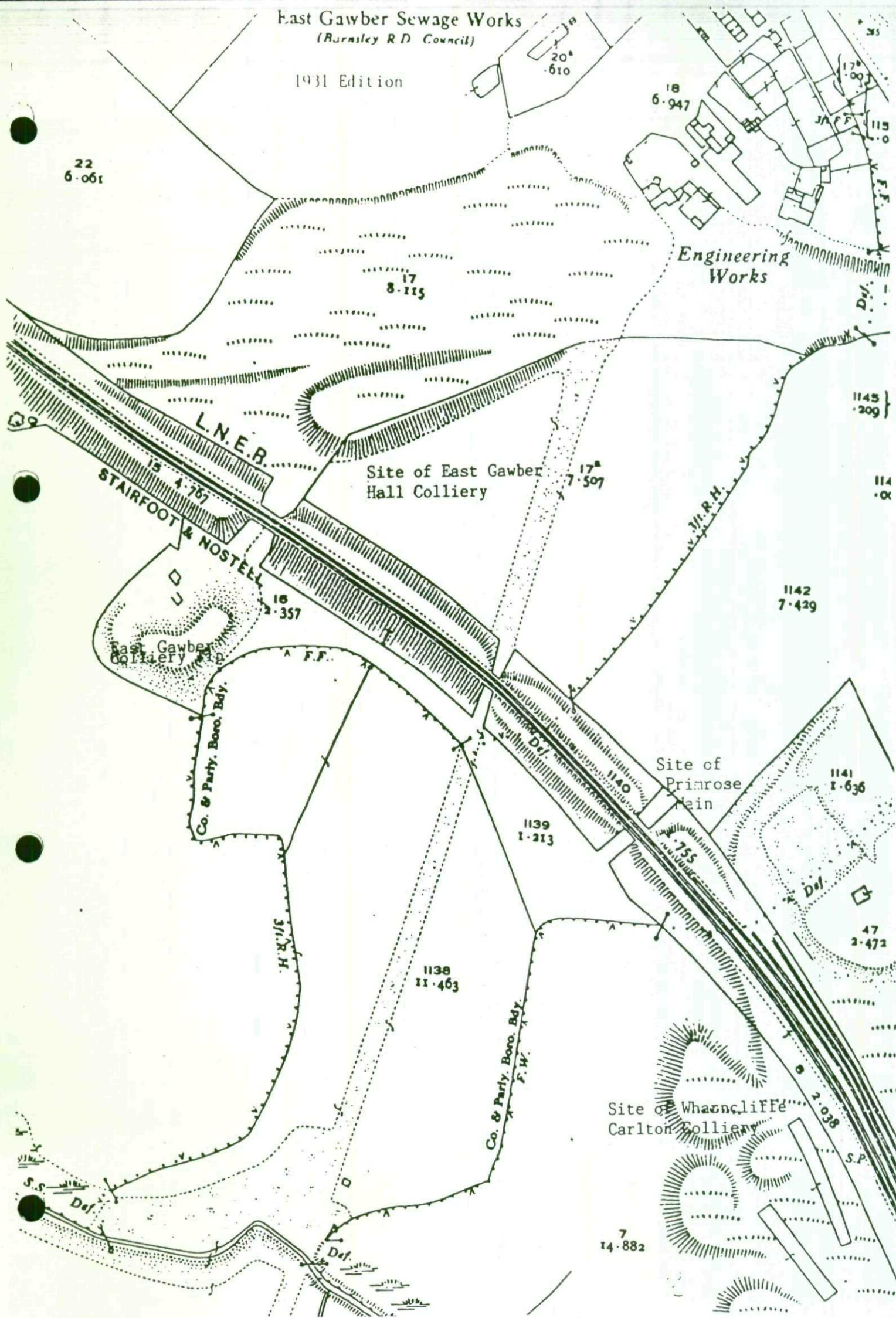
APPENDIX 2

1931/2 Editions

- i) East Gawber Sewage Works
East Gawber Hall Colliery (remains)
Primrose Main Colliery (remains)
Wharncliffe Carlton Colliery (remains)
- ii) Swallow Hill Sewage Works
- iii) Darton Colliery & Brickworks
- iv) Barugh Green Coking & Chemical Works

East Gawber Sewage Works
(Burnsley R.D. Council)

1931 Edition



22
6.061

17
8.115

18
6.947

L.N.E.R.
STAIRFOOT & NOSTELL

Site of East Gawber
Hall Colliery

Engineering
Works

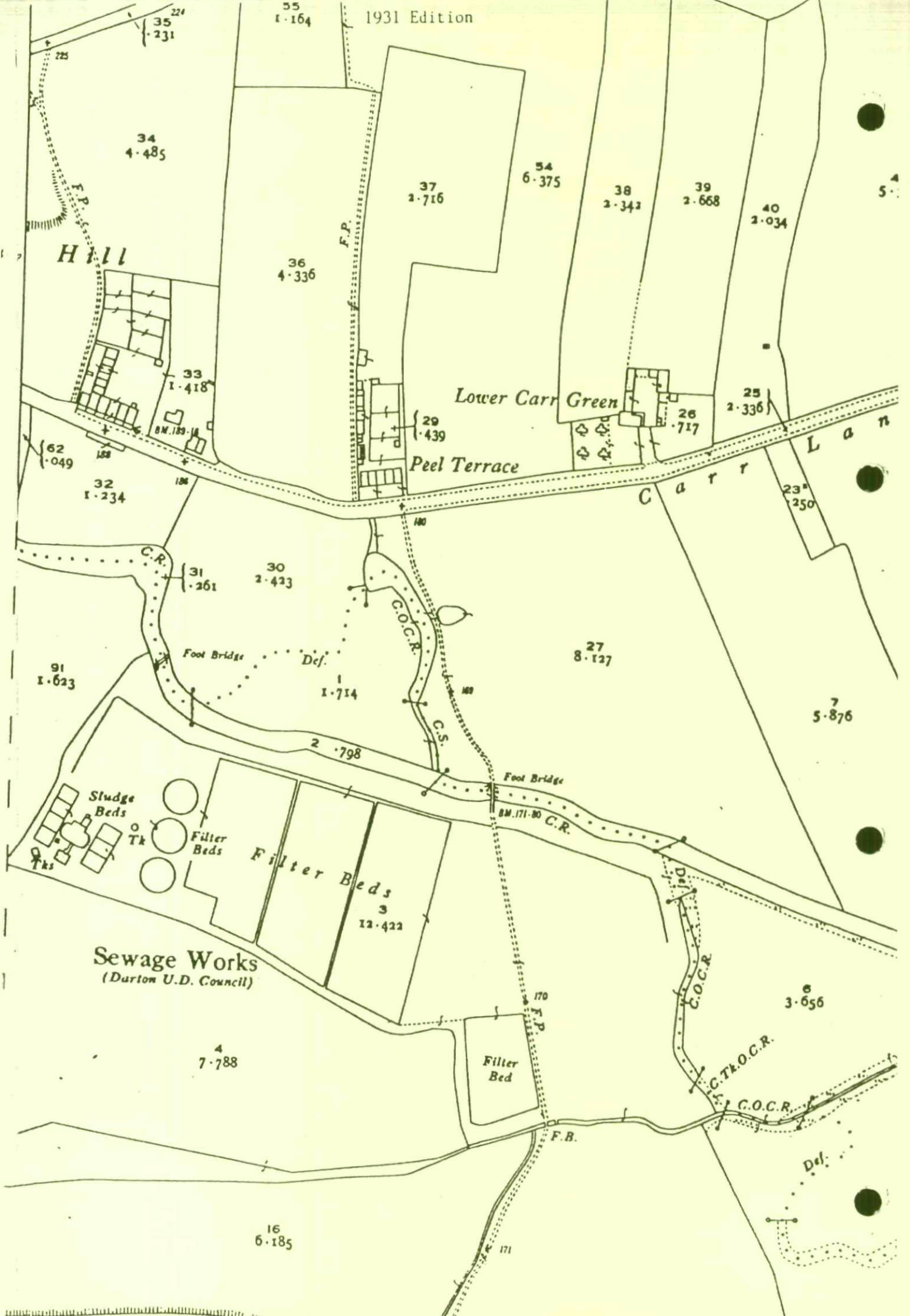
East Gawber
Colliery

Co. & Parly. Boro. Bdy.

Site of
Primrose
Main

Site of Wharfedale
Carlton Colliery

7
14.882



224
35
231

55
1.164

34
4.485

37
2.716

54
6.375

38
2.342

39
2.668

40
2.034

4
5

Hill

36
4.336

Lower Carr Green

25
2.336

Peel Terrace

26
717

29
439

23
250

Carr Lane

62
049

32
1.234

31
261

30
2.433

1
714

27
8.127

7
5.876

91
1.623

Foot Bridge

Def.

2
798

Foot Bridge

BM. 171-80
C.R.

Sludge Beds

Filter Beds

Filter Beds

3
12.422

Sewage Works
(Darton U.D. Council)

4
7.788

Filter Bed

170
F.P.

6
3.656

C.T.O.C.R.

C.O.C.R.

Def.

16
6.185

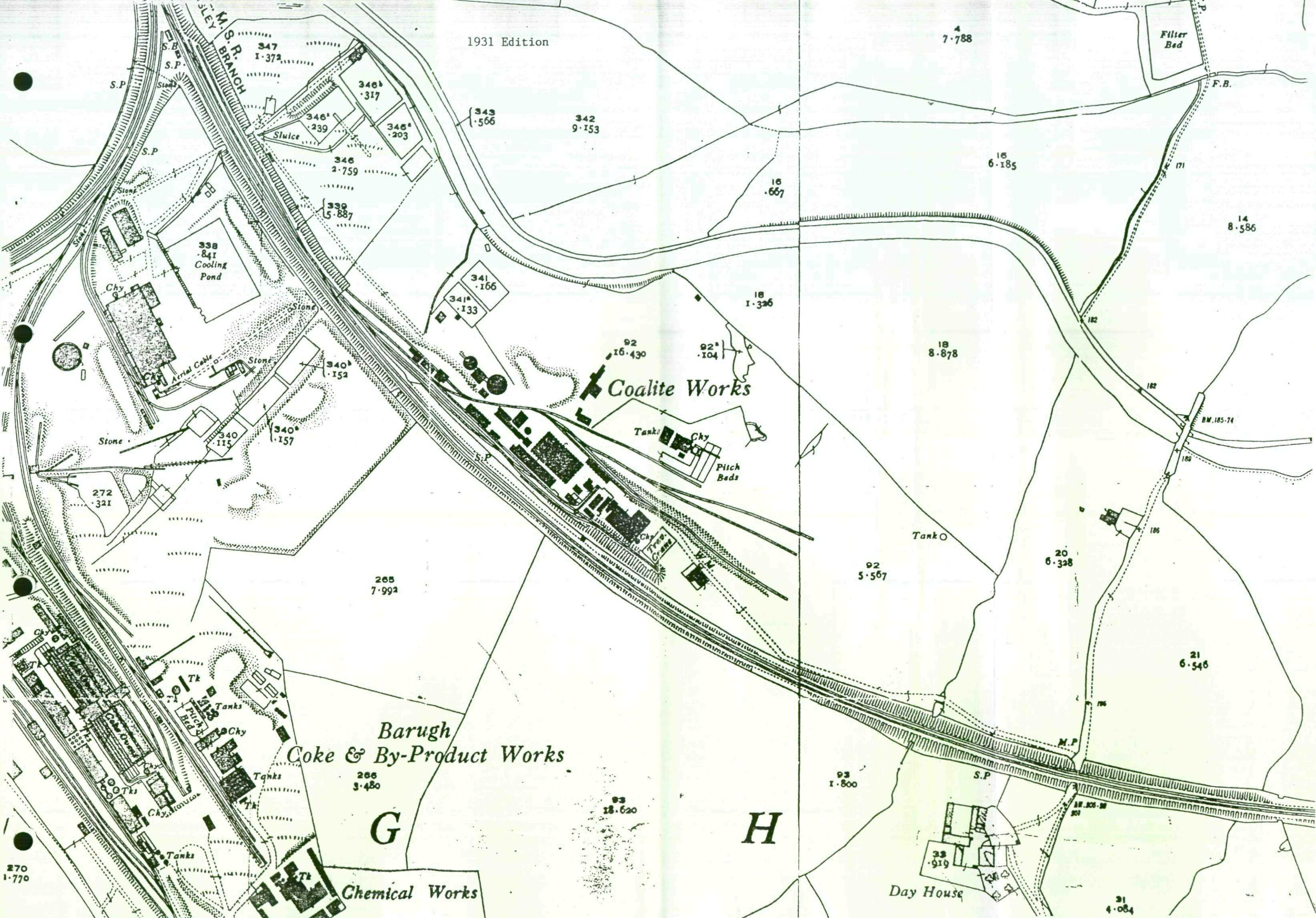
171

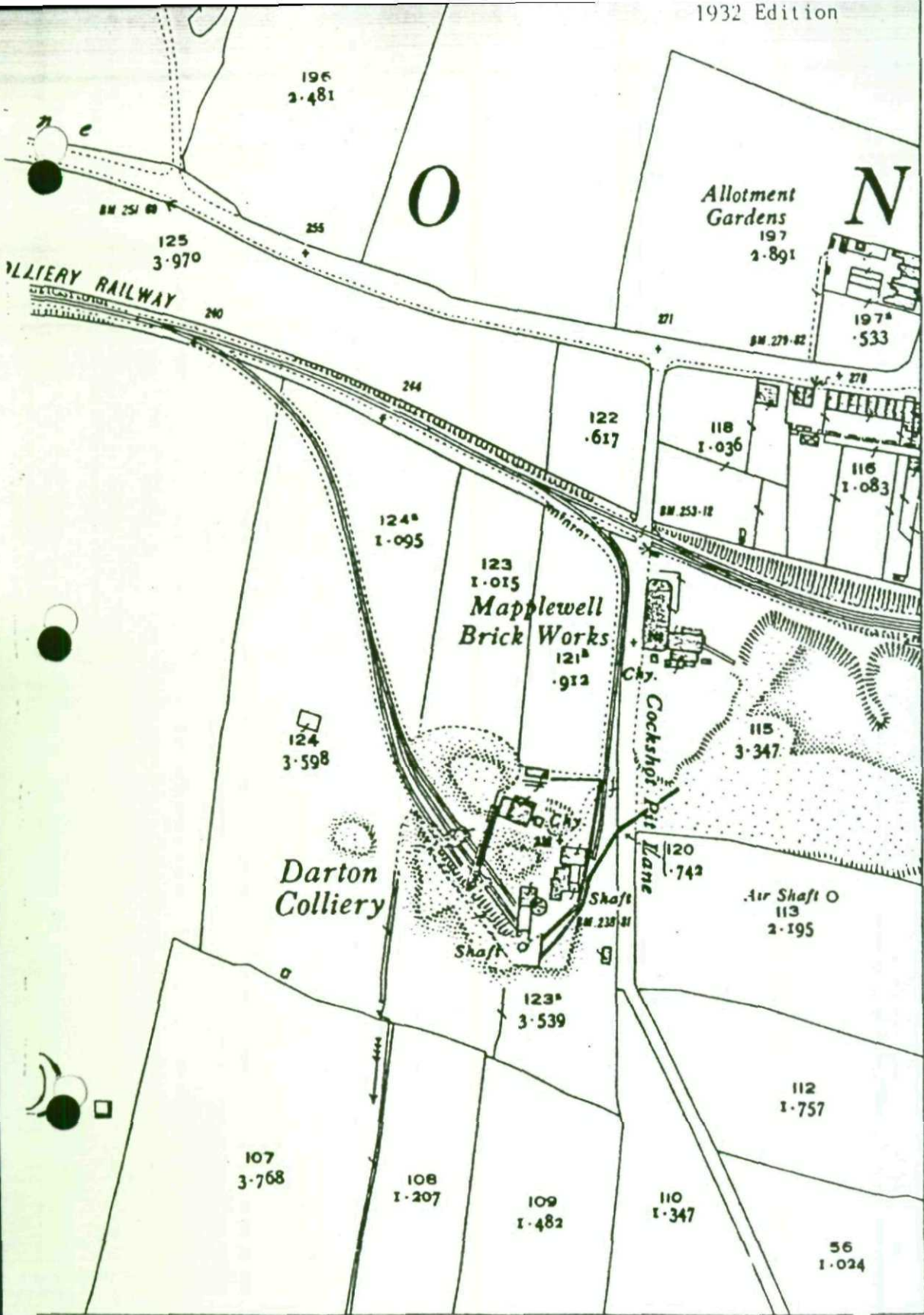


1931 Edition

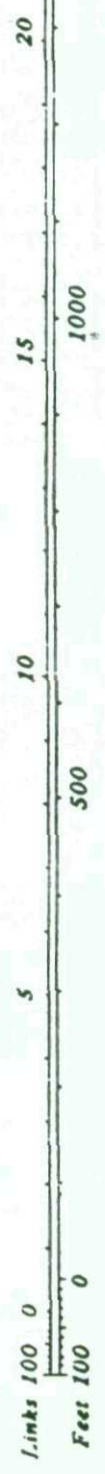
7.788

Filter Bed





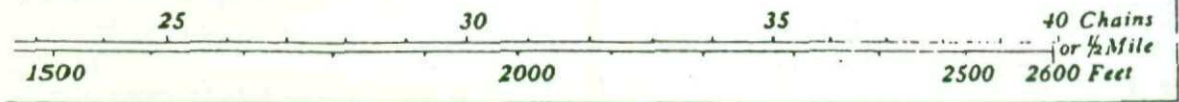
Mapplewell



PRICE 10/- NET.

YORKS. CCLXII. 14.

0.833 Feet to One Inch.



By the Director General at the Ordnance Survey Office, Southampton, 1932.

Crown Copyright Reserved.

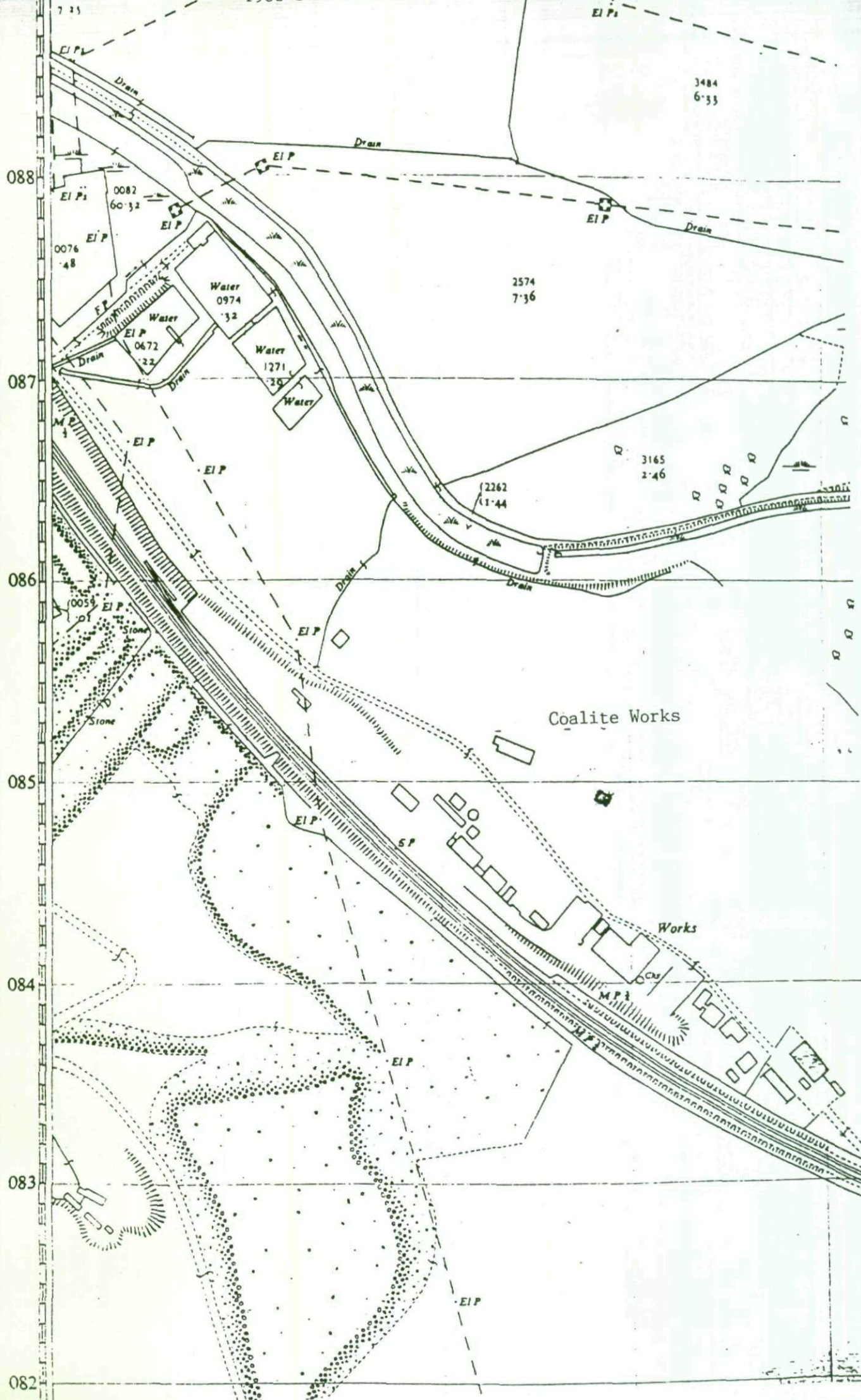
APPENDIX 3

1960's Editions

- i) North Gawber Colliery
- ii) Coalite Works

2500
2000
1500
1000
500

BARUGH AND HIGHAM WARD
DARTON UD & PH SE3108
WEST RIDING ADMIN CO





MINERAL RAILWAY

WENTWORTH ROAD

Blacker Hill

Cricketers Arms (PH)

Blacker Fm

Mine

North Gawber

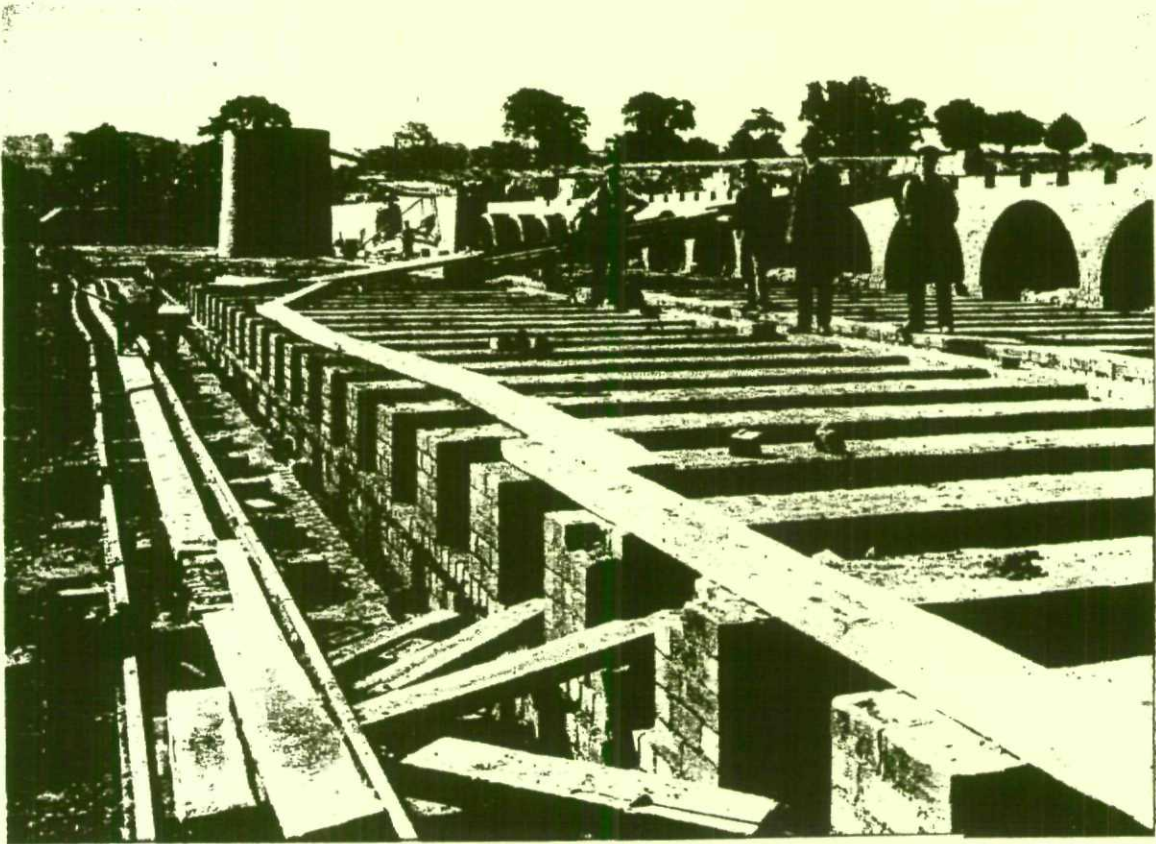
Bill End Farm

1960's Edition

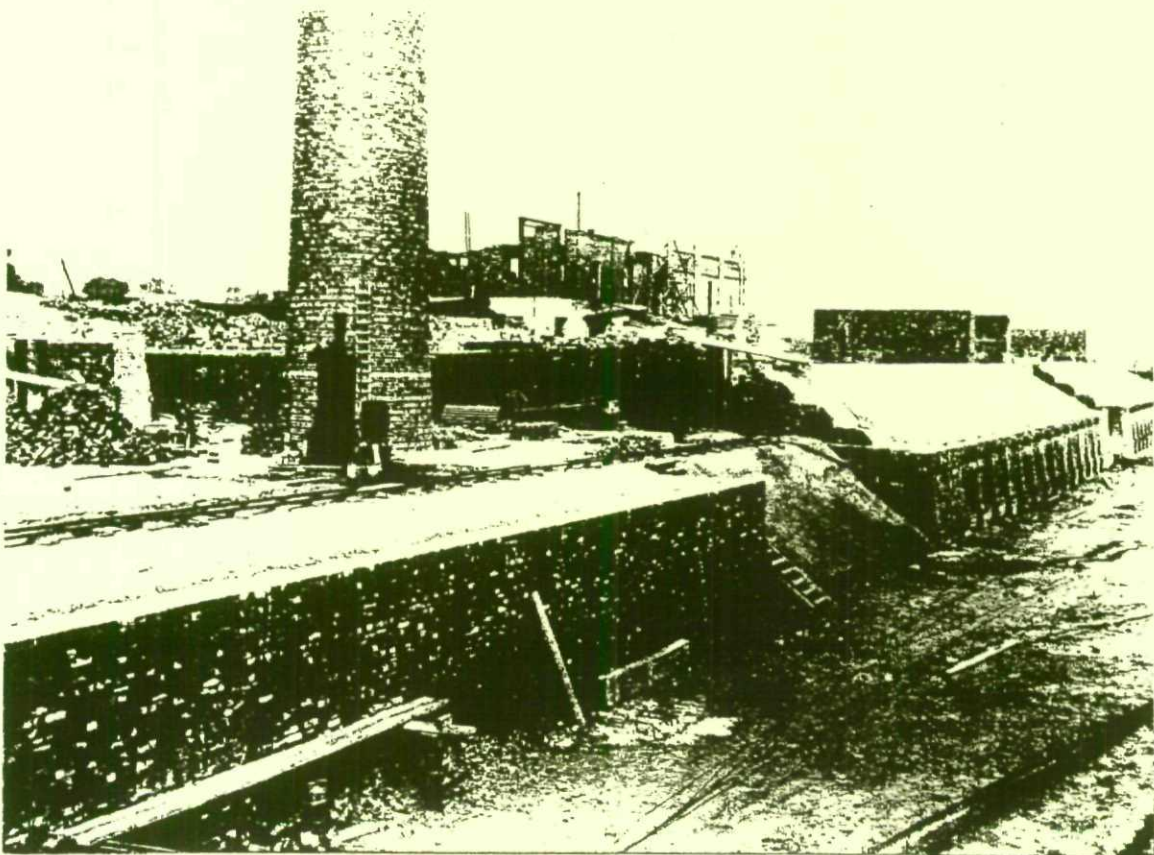


APPENDIX 5

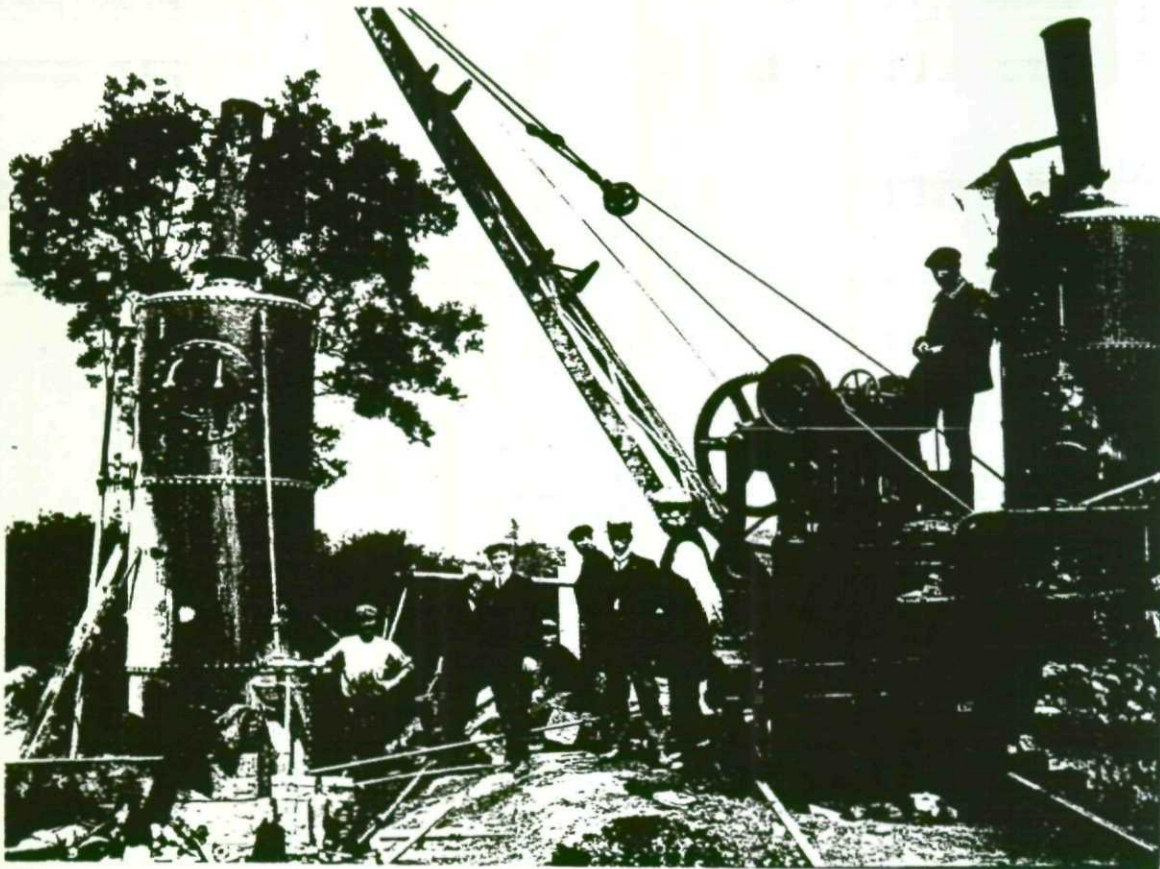
Photographs of Chemical Works under Construction



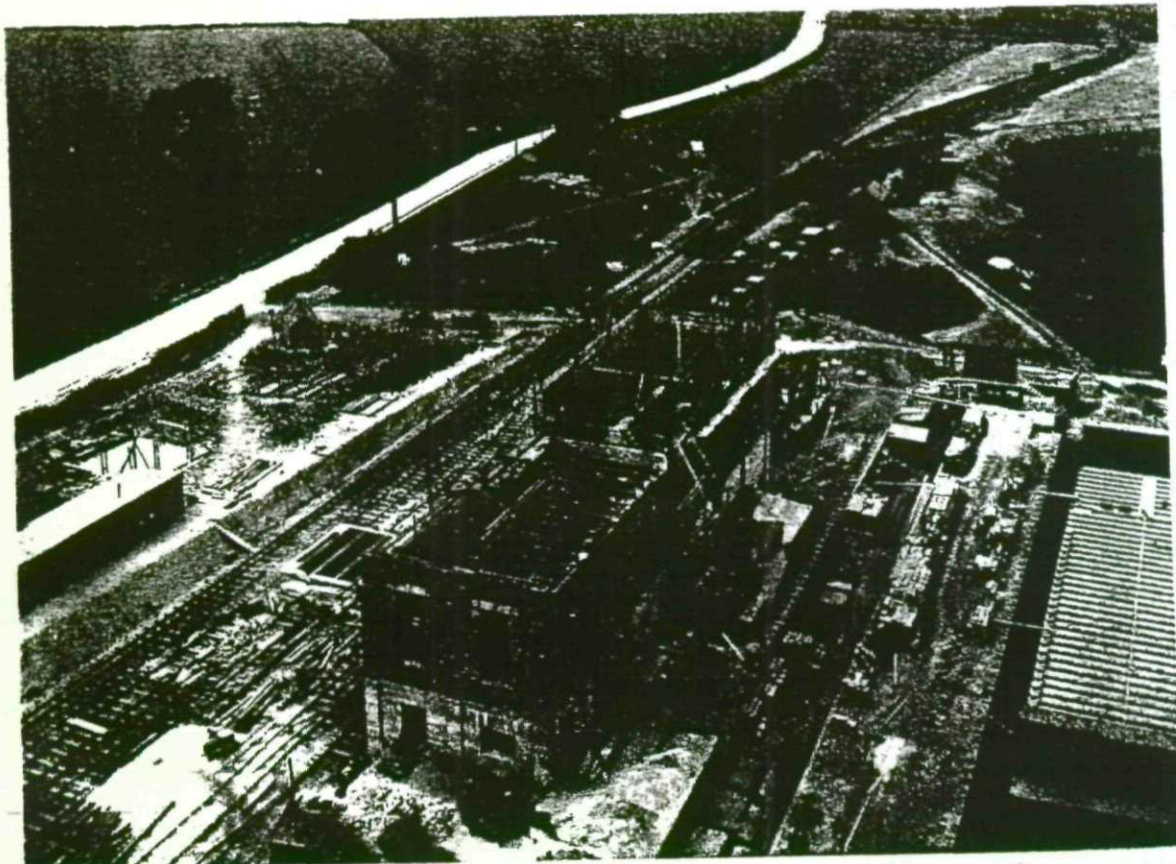
No 1 Battery - red brickwork foundation
ready for firebrick 20 06 1911



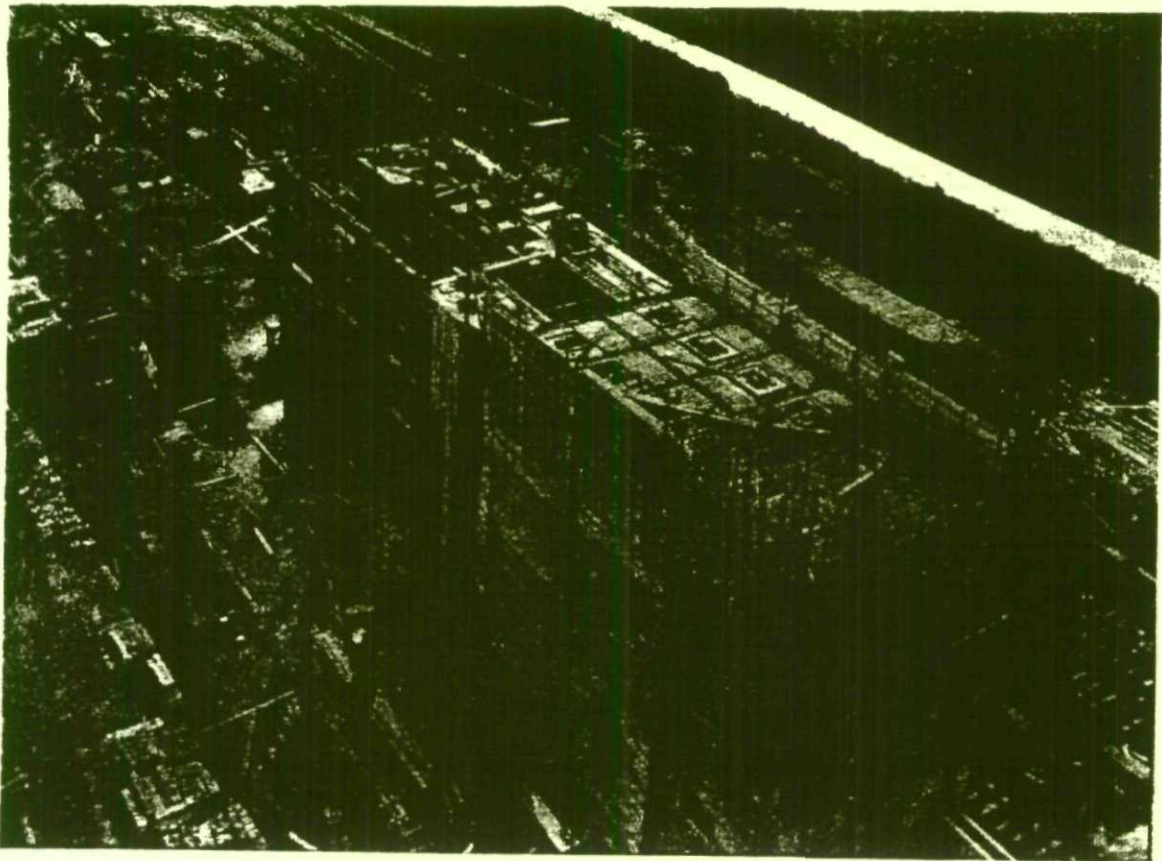
General view of works from SE corner



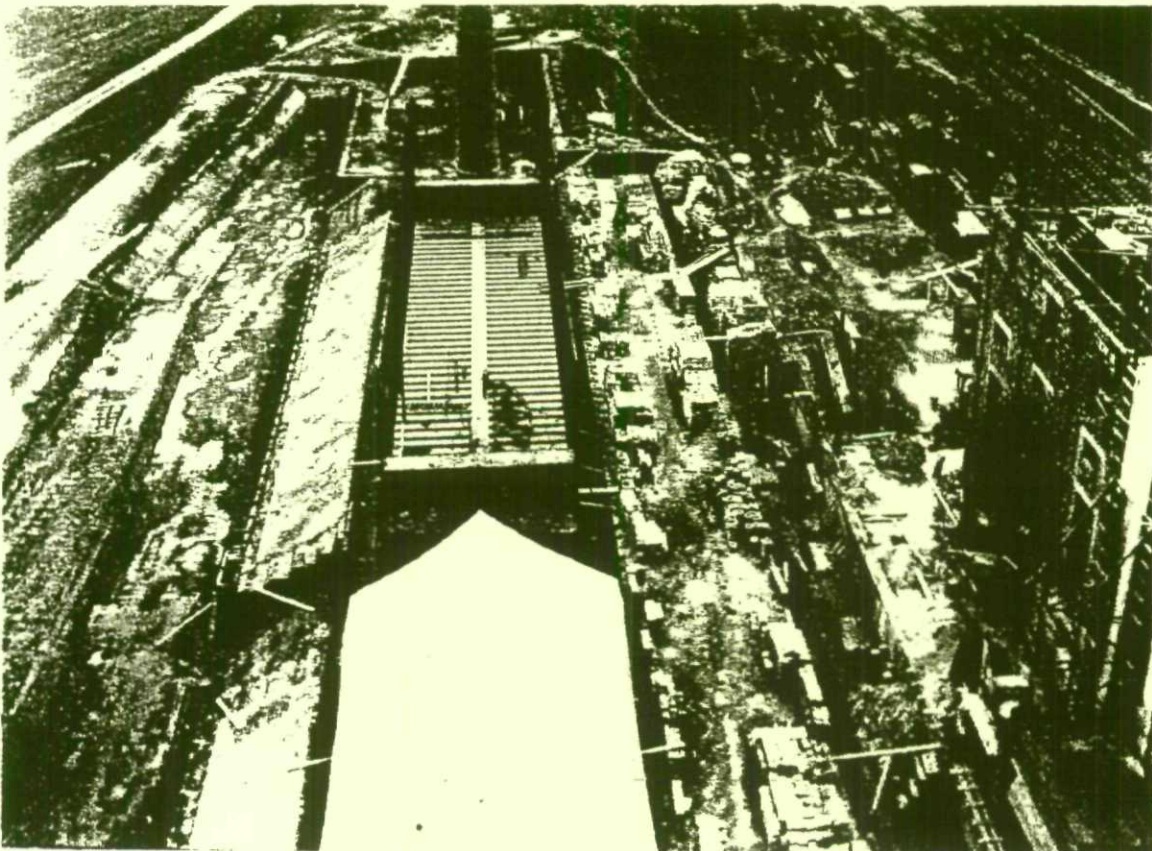
Sinking operations at well & reservoir
Crane and pump boiler 05 08 1911

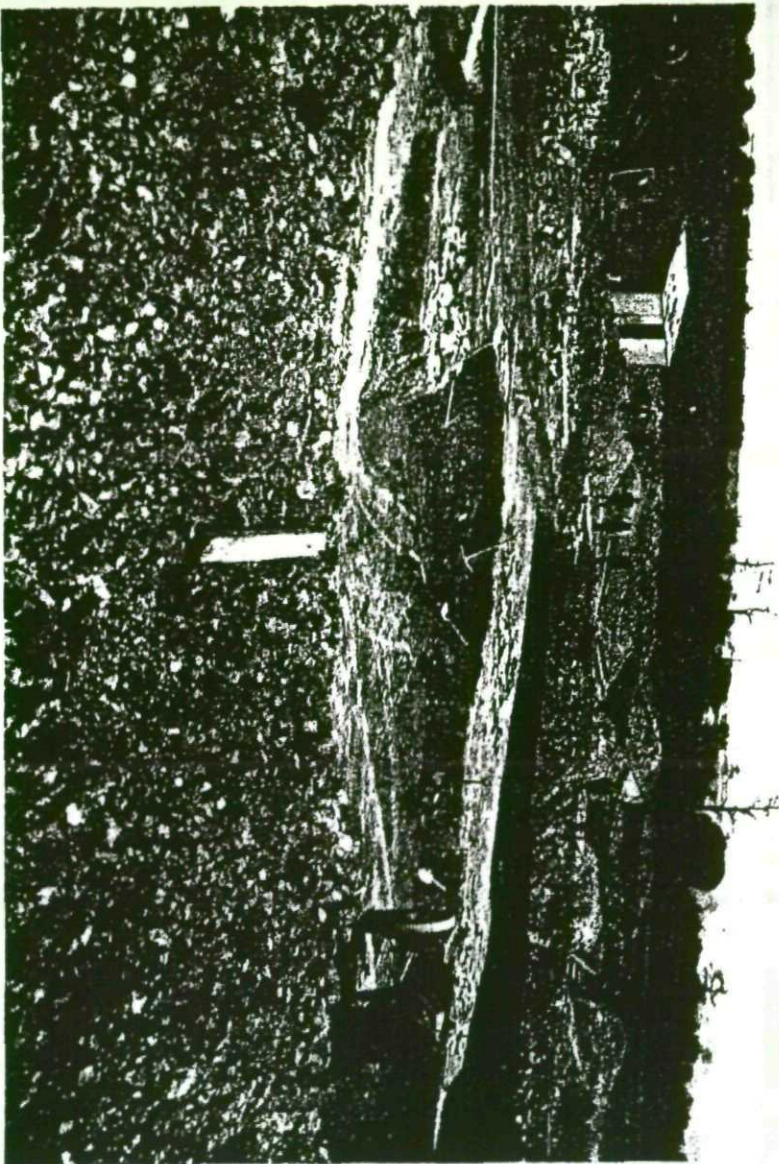


View from top of No 1
Battery chimney 05 08 1911

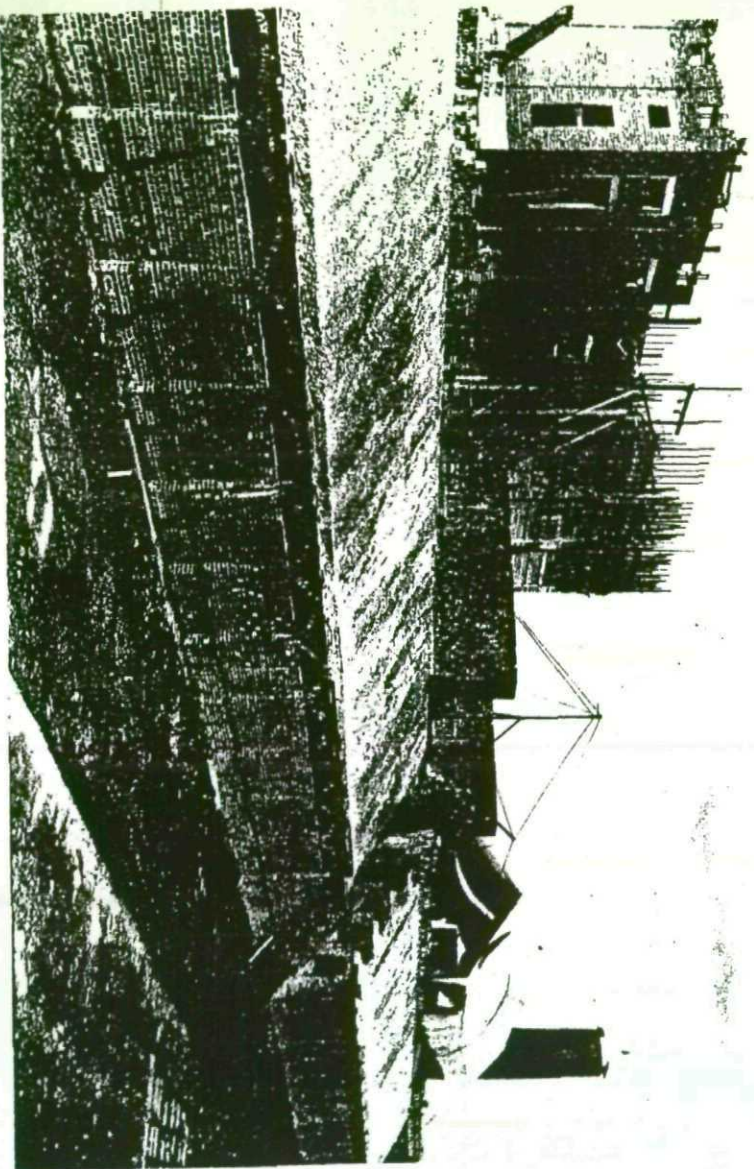


View from top of No 1
Battery chimney 22 08 1911

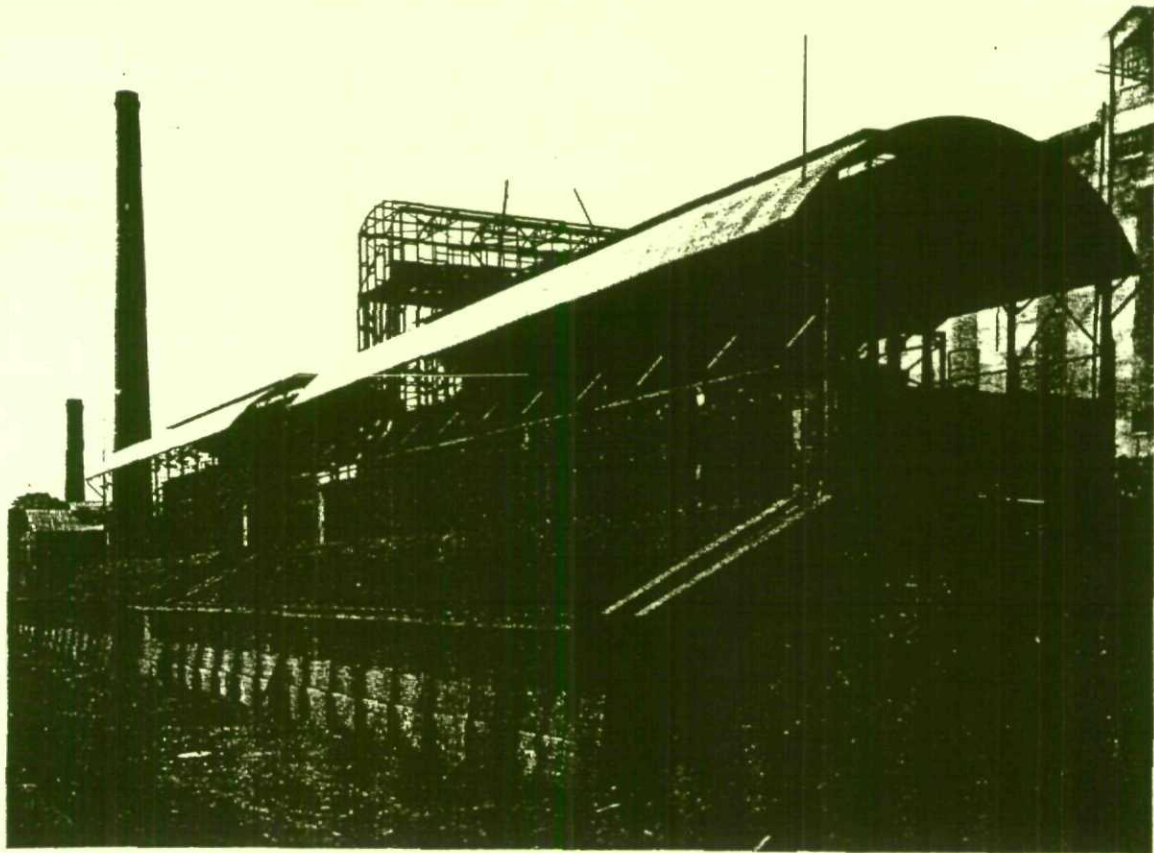




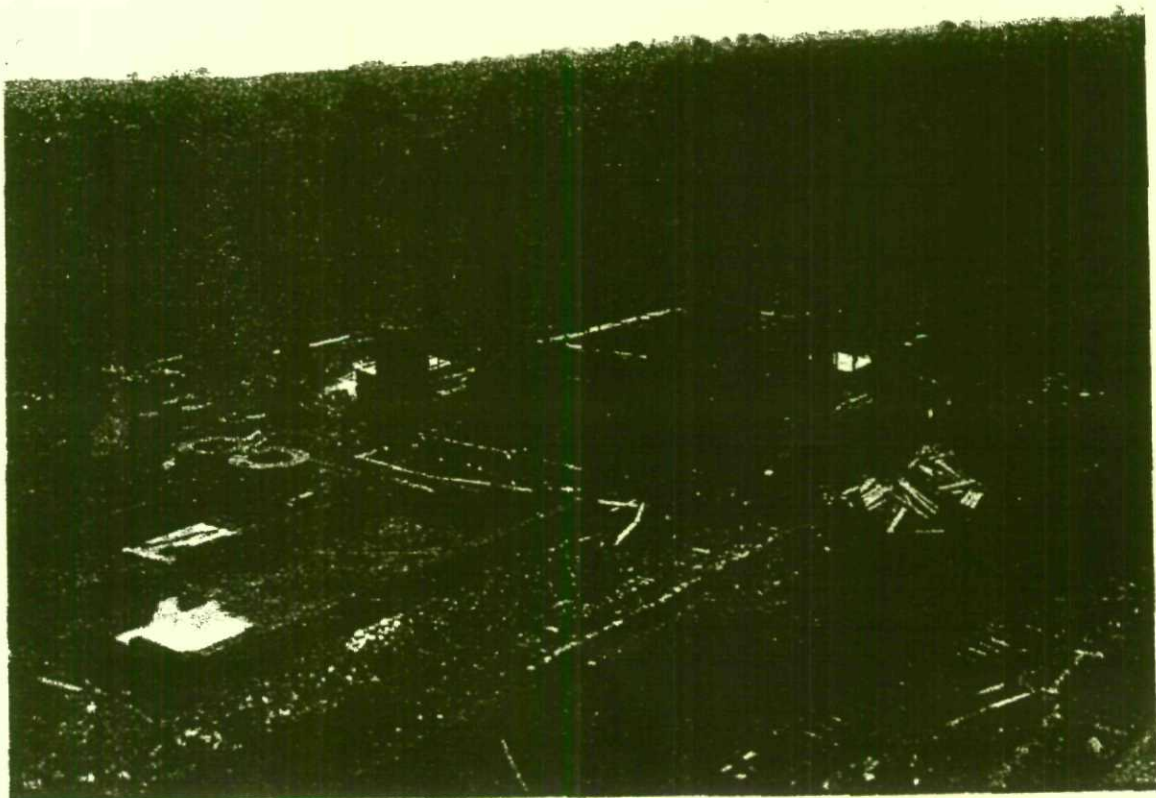
Excavations for Tar Plant 26 04 1912



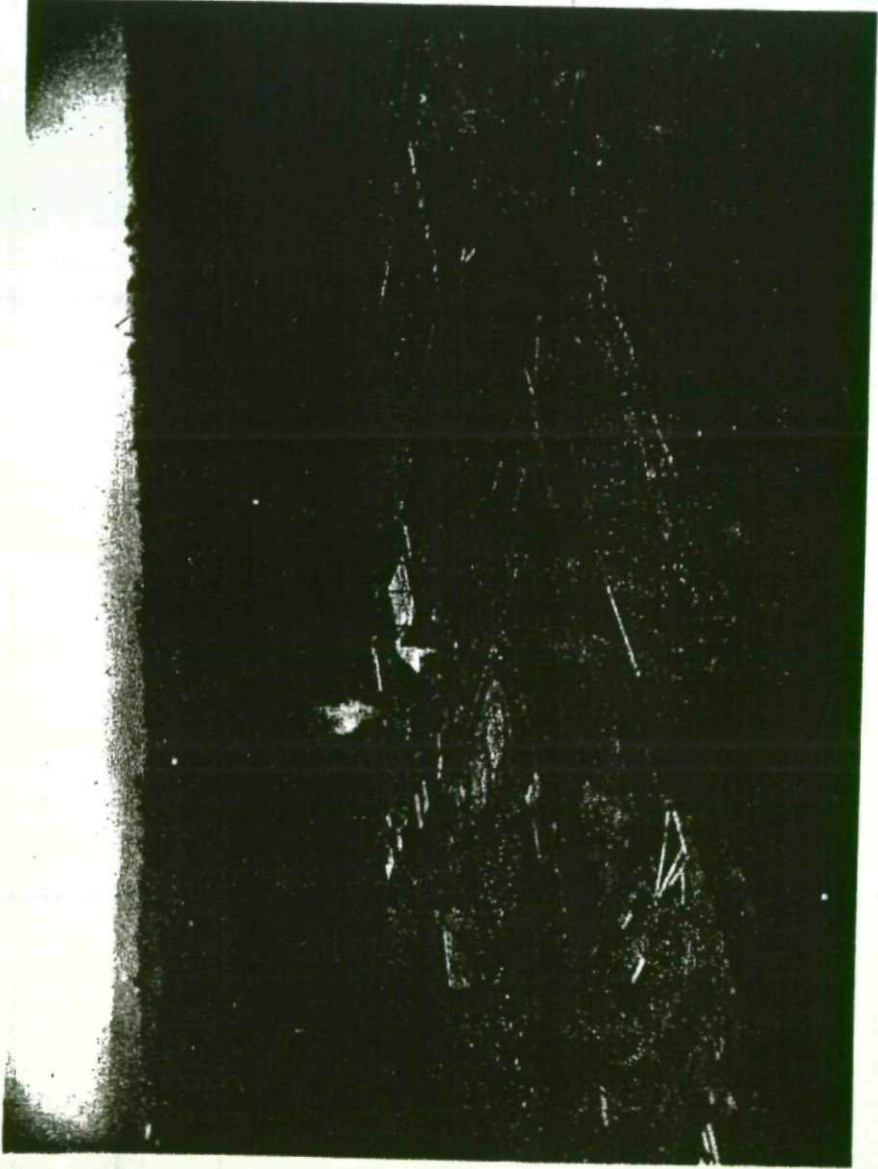
General view of works from SE corner



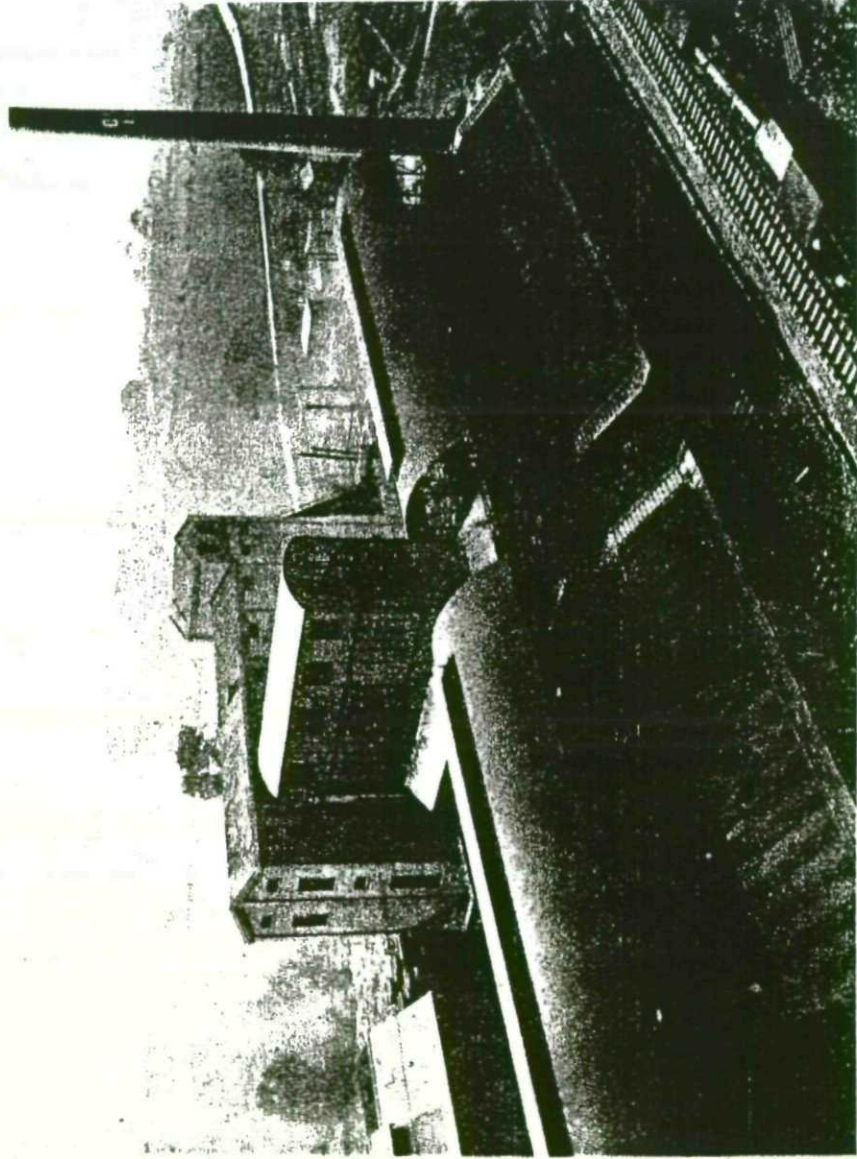
General view of works from South
End 26 04 1912



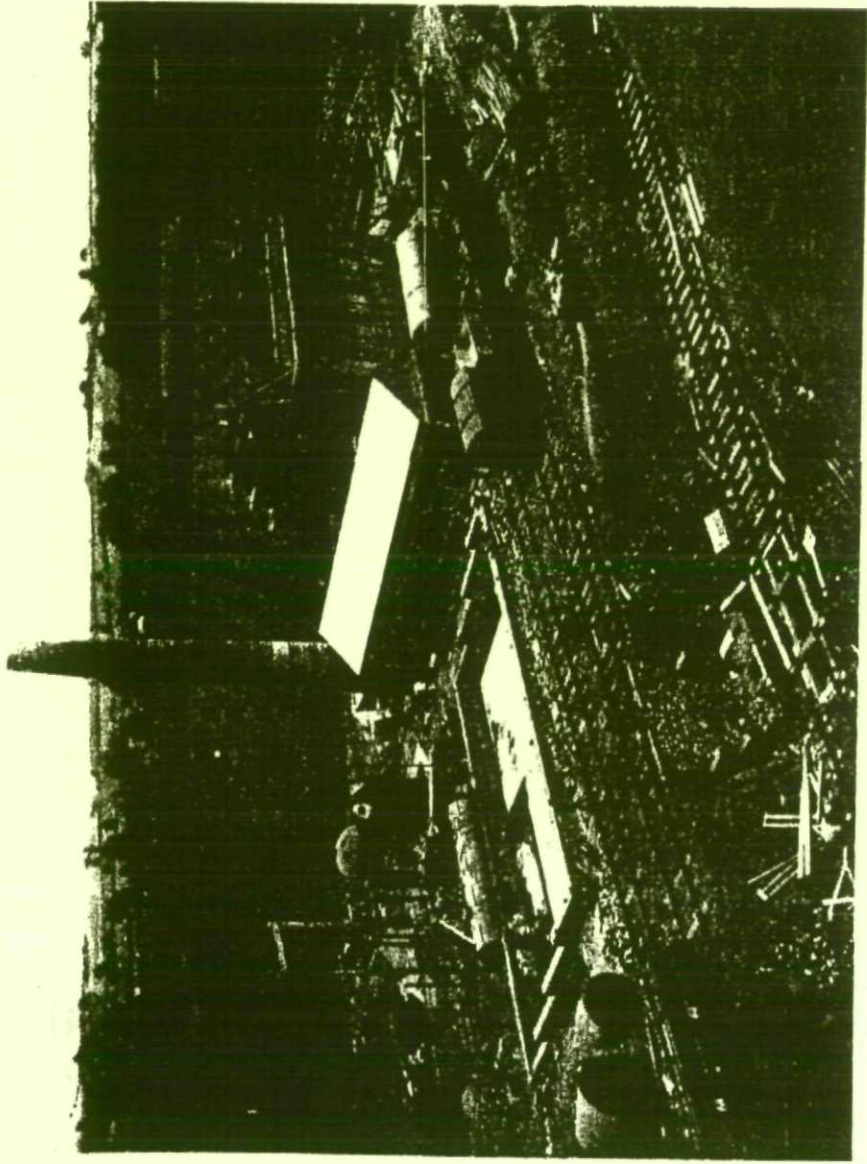
General view of Tar Plant pot May 1912



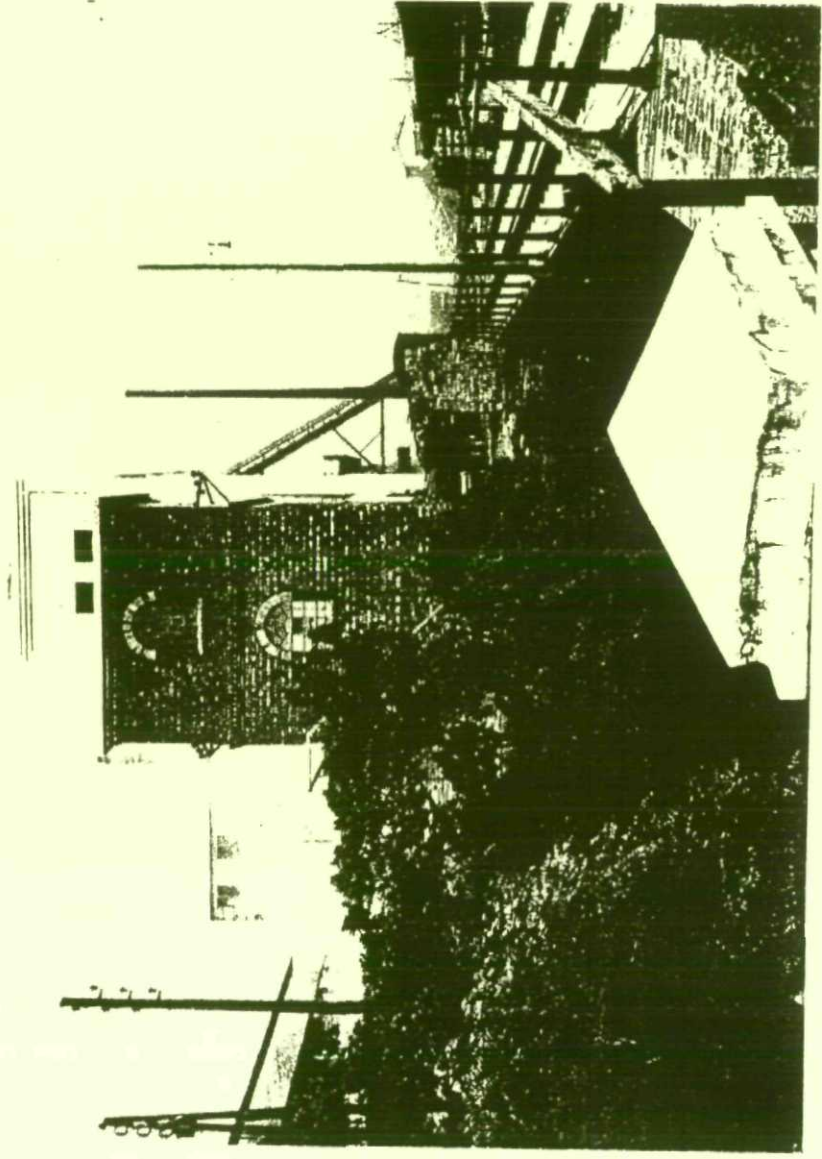
General view of Tar Plant 24 05 1912



Completed Works



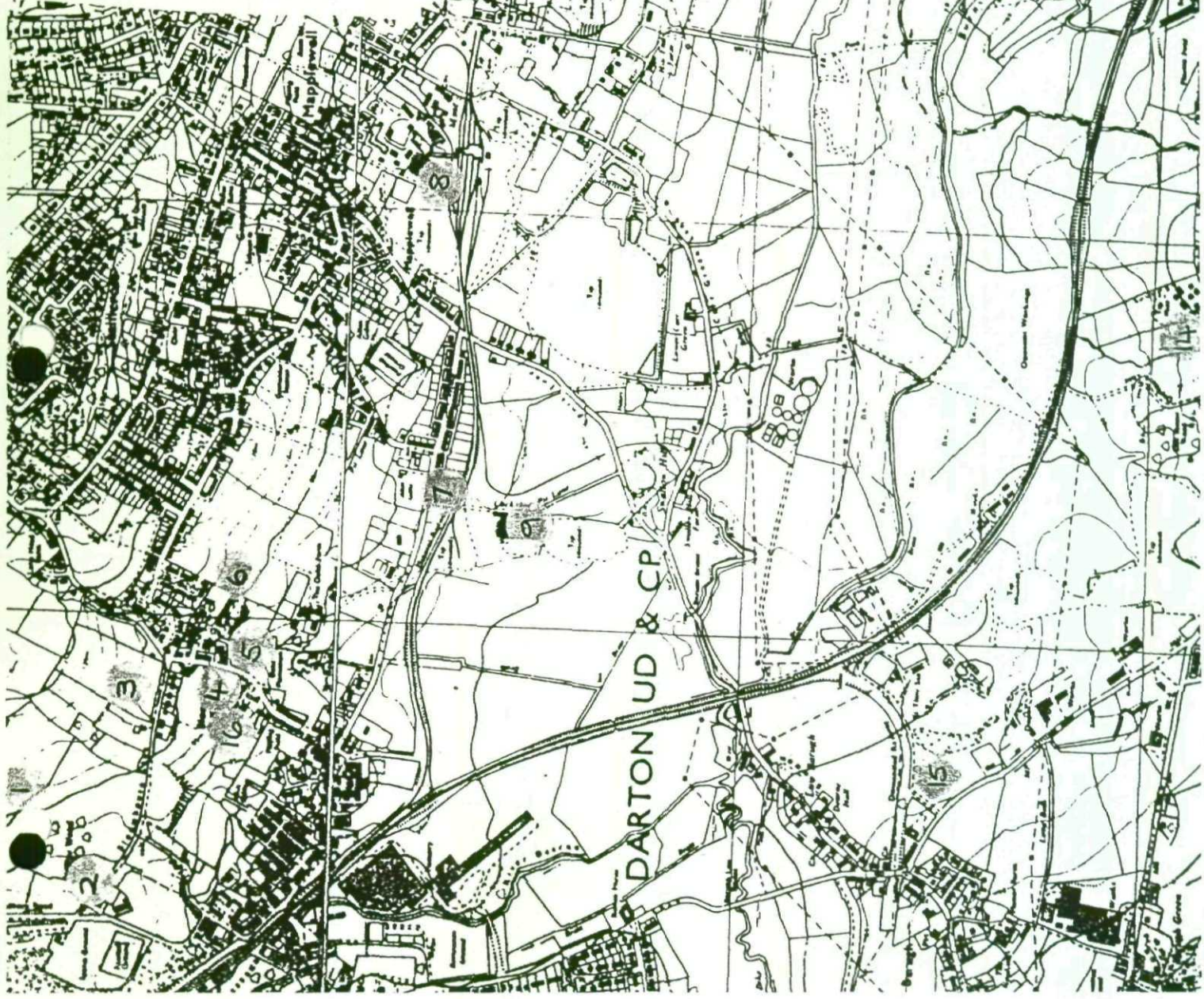
Unidentified



Appendix 6

Areas of Mining Activity

- 1 Pye Wood
- 2 Pye Wood
- 3 Unidentified
- 4 Darton Hall
- 5 Oaks
- 6 Staincross
- 7 Belle Vue
- 8 North Gawber
- 9 Darton
- 10 East Gawber Hall
- 11 Primrose Main
- 12 Wharmcliffe Carlton
- 13 Willow Bank
- 14 Redbrook/Day House
- 15 Old Silkstone
- 16 Bloomhouse Green








Darton Local Plan

Appendix 7

5:4

DERELICT, DESPOILED, DEGRADED LAND & POTENTIAL OPENCAST SITES

- Plan area boundary
Additional built up land
Derelict land 
Neglected land 
Underused land 
Despoiled land 
Areas of opencast coal interest 

- C - Former Coal Stocking Area
D - Former Coal Stocking Area
E - North Gawber (Hill End) Tip
F - North Gawber Colliery
H - Shaw Carpet Factory Tip
I - Blackerhill Tip
J - Spark Lane Quarry



Appendix 8 E8
Barnsley Local Plan: Areas
of environmental importance



APPENDIX D

COPY OF COAL AUTHORITY MINING REPORT

The Coal Authority,
Mining Reports Office,
100 LICHFIELD LANE,
BERRY HILL,
MANSFIELD,
NOTTINGHAMSHIRE,
NG18 4RG
Telephone: 0845 762 6848
DX 716176 MANSFIELD 5
On-Line Service: www.coalminingreports.co.uk

The 
COAL
AUTHORITY

The Coal Authority	
Cost:	£38.30
Plus V.A.T.	£6.70
Total Received:	£45.00
V.A.T. Reg Number	598 5850 68

SCOTT DOHERTY ASSOCIATES LTD,
CONSETT BUSINESS PARK,
VILLA REAL,
CONSETT,
COUNTY DURHAM,
DH8 6BP

This matter is being dealt with by Darren Moody

Our Ref: **00165380-04**

Your Ref: SDA/04014/01

Electronic Ref:

RRUID: 007.00001586360001

Date: 04 June 2004

Dear Sir,

Coal Mining Report
SITE AT, NORTH GAWBER COLLIERY, BARNSELY

I refer to the enquiry dated 28th May 2004, received 03rd June 2004, in connection with the above.

This report is based on and limited to the records in the possession of The Coal Authority at the time the search is answered.

Ordnance Survey (O.S.) is undertaking a Positional Accuracy Improvement Programme of its mapping data. The Coal Authority (CA) has no control over the timing of issue of Positionally Improved mapping data by O.S. or over users of that data. In some instances the relative position between surface features and coal mining features may alter as a consequence of this programme. The CA will ensure that the integrity of its database is maintained by replotting some mining information to sustain the relationship between that mining information and the improved O.S. surface positions, some of which are now being released. However, mining reports are currently being produced against pre improved O.S. mapping whilst the Authority updates its database in line with the O.S. changes.

Past Underground Mining

The property is within the likely zone of influence on the surface from workings in 9 seams of coal at shallow to 340m depth, the last date of working being 1981.

Present Underground Mining

The property is not within the zone of likely physical influence on the surface from any present underground coal workings.

Future Underground Mining

The property is not within a geographical area for which a licence to extract coal by underground methods is awaiting determination by the Coal Authority.

The property is not within a geographical area for which a licence to extract coal by underground methods has been granted.

The property is not within the zone of likely physical influence at the surface from plans of future workings in our possession.

However reserves of coal exist in the locality which could be worked at some time in the future subject to feasibility, licences, and planning consents.

We have no record of any notice of the risk of the land being affected by subsidence being given under S.46 of the Coal Mining Subsidence Act 1991.

Shafts and Adits

Within or within 20 metres of the property there are 8 mine entries, the approximate positions of which are shown on the attached plan. Your attention is drawn to the statements made on that plan.

Our records disclose the following information:

433409-016. No treatment details.

433409-011. was filled in May 1987 .

433409-005. No treatment details.

433409-001. was filled to the surface in 1967 .

432409-028. No treatment details.

432409-027. No treatment details.

432409-026. No treatment details.

432409-025. No treatment details.

The records held by the Coal Authority may be incomplete. Consequently, there may exist in this locality mine entries of which we have no knowledge.

Surface Geology

Records in our possession do not disclose any fault or other line of weakness at the surface as having affected the stability of the property.

Past Opencast Mining

The property is located within the geographical boundary of an opencast site from which coal has been extracted by opencast methods.

Present Opencast Mining

The property does not lie within 200 metres of the geographical boundary of an opencast site within which coal is being extracted by opencast methods.

Future Opencast Mining

The property is not within 800 metres of the geographical boundary of an opencast site for which a licence to extract coal by opencast methods is awaiting determination.

The property is within 800 metres of the geographical site boundary of the Barugh Bridge (Gawber) prospective opencast site for which a licence to extract coal by opencast methods was granted in October 1994. The grant of this licence is conditional on the applicant securing any other rights, permissions (including planning permissions) and consents to enable him to carry out his operations.

Subsidence

The records in our possession do not disclose any damage notice or claim having been given, made or pursued in respect of the property since 1 January 1984.

The records in our possession do not disclose any current "Stop Notice" affecting the property.

The records in our possession do not show any request having been made to execute preventative works under S.33 of the Coal Mining Subsidence Act 1991.

Withdrawal of Support

The property lies within a geographical area in respect of which notices of entitlement to withdraw support were published in 1946,1947,1947,1947,1979.

The property does not lie within a geographical area in respect of which a notice has been given under S.41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not within a geographical area that is the subject of an Order made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to Owners of Former Copyhold Land

The property is not within an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Additional Remarks

In view of the mining circumstances a prudent developer would seek appropriate technical advice before works are undertaken on site. All proposals should have regard to good engineering practice in mining areas as identified in authoritative publications on mining stability problems. In any event, no activities should be undertaken that intersect, disturb, or interfere with any coal or mines of coal without permission of the Coal Authority.

These replies are prepared in accordance with the 2003 editions of the Coal Authority's Terms and Conditions, User Guide and the Law Society's Guidance Notes.

Copyright in coal mining reports and certificates belongs to the Coal Authority. Information used to compile this report is protected by the Coal Authority's database right. All rights are reserved and unauthorised use is prohibited.

Copyright and other intellectual property is not transferred to external parties by possession of a mining report or certificate, however those for whom the report is supplied have the right to use it.

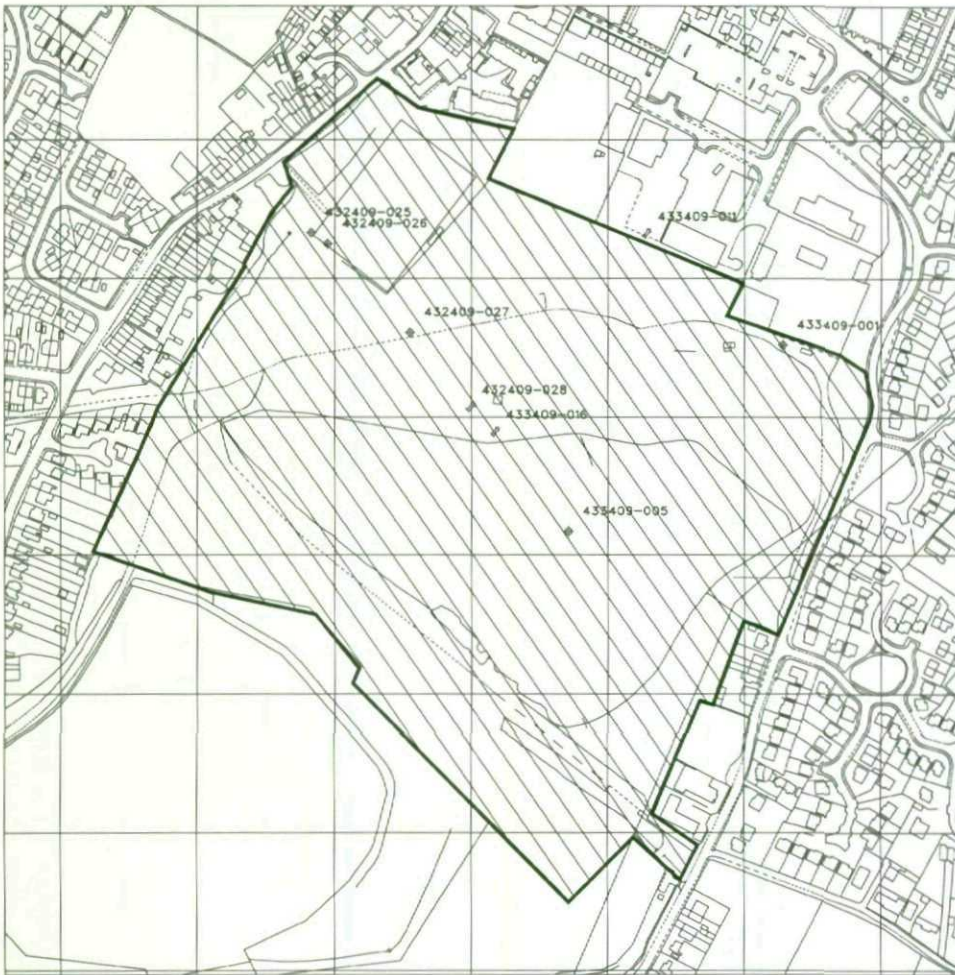
We acknowledge the receipt of your remittance in payment of our fee.

Yours faithfully



Albert Schofield

Director of Mining Information and Services



Crown Copyright. Quoted scale is approximate.

SCALE: 1:5000

This map is reproduced from the Ordnance Survey material by The Coal Authority [or division thereof] with the permission of the Controller of Her Majesty's Stationery Office, Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number: AL51060A001.

This is a plan of the boundaries of the property in respect of which this report has been prepared. It is the responsibility of the user to ensure that the boundaries shown correspond with those of the property.

APPROXIMATE POSITION OF ENQUIRY BOUNDARY SHOWN



APPROXIMATE POSITION OF DISUSED MINE SHAFTS SHOWN



APPROXIMATE POSITION OF DISUSED MINE ADITS SHOWN



This plan shows the approximate location of the disused mine entry/entries referred to in the attached mining report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan. Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A DTI leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848. If you wish to discuss the relevance of any of the information contained in the attached report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source plans from which the information has been taken these are available at our Mansfield office, free of charge, by prior appointment, telephone 01623 638233. Should you or your advisor wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority. The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

APPENDIX E
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)	
0.40	[Cross-hatch pattern]	MADE GROUND (Black very clayey sand and gravel of coal, brick, siltstone and mudstone. Gravel is fine to coarse, angular to subrounded).	(0.30)	70.29	0.40	D				
			0.30							
1.00	[Cross-hatch pattern]	MADE GROUND (Firm brown black and grey sandy gravelly clay. Gravel is fine to coarse, angular to subrounded and consists of coal, mudstone, siltstone and rare sandstone).	(1.20)	69.09	1.50	D				
			1.50							
2.00	[Cross-hatch pattern]	MADE GROUND (Firm and soft brown black and red very gravelly sandy clay gravel is fine to coarse, angular to subrounded and consists of mudstone, brick, burnt shale and siltstone. Slight seepage at 1.8m.	(0.70)	68.39	2.20	D				
										2.20
										2.40
										2.40
3.00	[Cross-hatch pattern]	MADE GROUND (Wet, brown very clayey angular to subangular sand and gravel of brick, burnt shale, coal, mudstone and sandstone).	(0.40)	67.79	2.70	D				
										2.60
										(0.30)
										3.10
4.00	[Cross-hatch pattern]	Possibly reworked, firm light brown, grey and yellow sandy gravelly CLAY with pockets of coal and mudstone gravel. Gravel is fine to coarse, subangular to subrounded and consists of coal, mudstone and sandstone.		67.49	2.90	D				
5.00		Stiff friable light brown and grey mottled sandy gravelly CLAY with occasional subrounded								

Continued next sheet

Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 70.6 Coordinates: 433116E - 409465N	Groundwater: Slight seepage at 1.8m.
--	---

Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample	Remarks: Trial pit sides very unstable.
--	--

Trial Pit: TP01	TRIAL PIT RECORD	Revision: Final
	North Gawber Site	Project No. 04014



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)
6.00		cobbles of sandstone. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, siltstone and mudstone. End of Trial Pit at 3.10 m							
7.00									
8.00									
9.00									
10.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 70.6 Coordinates: 433116E - 409465N				Groundwater: Slight seepage at 1.8m.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides very unstable.					
Trial Pit: TP01			TRIAL PIT RECORD North Gawber Site			Revision: Final Project No. 04014			



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	[Cross-hatched pattern]	MADE GROUND (Grass over firm and stiff brown black and red very gravelly sandy clay. Gravel is fine to coarse, subangular to subrounded and consists of burnt shale and coal with occasional sandstone, mudstone and brick. Contains cobbles of sandstone, timber fragments, many whole bricks, plastic and metal fragments)	(2.20)		0.60	D			
2.00		Very faint odour of hydrogen sulphide from 1.9m.	2.20	69.89	1.90	D			
3.00	[Dotted pattern]	MADE GROUND (Firm brown slightly gravelly sandy clay. Gravel is fine to coarse, angular to subangular and consists of sandstone, siltstone, coal and burnt shale).	(0.30) 2.50	69.59	2.80	D			
4.00		Firm light orange brown and grey sandy gravelly CLAY. Slightly friable. Gravel is fine to coarse, subangular to subrounded and consists of mudstone, sandstone and rare coal.	(0.80) 3.30	68.79					
5.00		End of Trial Pit at 3.30 m							
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 72.1 Coordinates: 433043E - 409489N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides stable.						
Trial Pit: TP02		TRIAL PIT RECORD				Revision: Final			
		North Gawber Site				Project No. 04014			



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	[Cross-hatched pattern]	MADE GROUND (Rough grass over firm and stiff dark brown and black sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of mudstone, coal and sandstone).	(1.00)		0.70	D			
2.00		MADE GROUND (Firm grey and black sandy gravelly clay. Gravel is fine to medium angular subangular and consists of mudstone, sandstone and coal. Many cobbles and boulders of siltstone and mudstone, timber fragments, brick and burnt shale gravel). (Occasional whole bricks and much fine to coarse gravel of burnt shale from 1.9m with mudstone cobbles).	(1.90)	72.70	1.80	D			
3.00		MADE GROUND (Very moist black clayey sand with fine to medium gravel of burnt shale and mudstone. Moderate seepage into pit from 3.1m).	2.90	70.80					
3.00			(0.35)		3.20	D			
			3.25	70.45					
			3.40	70.30	3.30	D			
4.00		Firm and soft grey brown, mottled black, sandy CLAY/SILT becoming orange brown sandy slightly gravelly clay with depth. End of Trial Pit at 3.40 m							
5.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 73.7 Coordinates: 432969E - 409544N			Groundwater: Moderate seepage into pit at 3.1m.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides unstable from 2.9m.						
Trial Pit: TP03		TRIAL PIT RECORD			Revision: Final			 SCOTT DOHERTY ASSOCIATES	
					North Gawber Site				

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 (Grass over firm brown and light brown sandy gravelly clay. Gravel is fine to coarse angular to subangular and consists of sandstone and mudstone).	(0.40)	74.97					
1.00		MADE GROUND (Firm and stiff light brown and grey sandy gravelly clay. Gravel is fine to coarse angular to subangular and consists of coal, siltstone, sandstone and mudstone. Many timber fragments).	(1.00)		0.90	D			
		MADE GROUND (Firm light brown and grey friable sandy gravelly clay. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, mudstone and coal. Possibly reworked clay).	1.40	73.97					
2.00		MADE GROUND (Firm light brown and grey friable sandy gravelly clay. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, mudstone and coal. Possibly reworked clay).	(0.80)						
		Soft and firm black and brown sandy peaty CLAY/SILT. Many decayed rootlets and plant material. Possibly old topsoil).	2.20	73.17					
		Stiff orange brown and grey sandy gravelly CLAY. Gravel is fine to coarse, angular to subrounded and consists of sandstone and mudstone.	(0.30)	72.87	2.40	D			
3.00		Stiff orange brown and grey sandy gravelly CLAY. Gravel is fine to coarse, angular to subrounded and consists of sandstone and mudstone.	2.50						
		Soft and firm black and brown sandy peaty CLAY/SILT. Many decayed rootlets and plant material. Possibly old topsoil).	(0.80)						
		Stiff orange brown and grey sandy gravelly CLAY. Gravel is fine to coarse, angular to subrounded and consists of sandstone and mudstone.	3.30	72.07					
4.00		End of Trial Pit at 3.30 m							
5.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 75.4 Coordinates: 432838E - 409589N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides unstable throughout.						
Trial Pit: TP04		TRIAL PIT RECORD				Revision: Final			
		North Gawber Site				Project No. 04014			



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 (Grass over black and brown firm sandy very gravelly clay. Gravel is fine to coarse angular to subrounded and consists of mudstone and burnt shale. Large sandstone boulder, metal wires and pockets of orange brown sandy clay).	(1.10)		0.80	D				
		Soft and firm black and grey CLAY/SILT becoming more clayey with depth. Moderately strong hydrogen sulphide odour.	(0.40)		1.70	D				
		Firm light brown and yellow CLAY/SILT.	1.50	74.23						
			(0.50)							
2.00		Firm light brown and yellow CLAY/SILT.	2.00	73.73						
		Stiff friable orange brown and grey sandy slightly gravelly CLAY. Gravel is fine to medium, subangular to subrounded and consists of sandstone and mudstone.	(1.10)							
3.00		End of Trial Pit at 3.10 m	3.10	72.63						
4.00										
5.00										
Date of Excavation: 18/08/2004			Groundwater:							
Equipment: JCB 3CX			Groundwater not encountered.							
Logged By:										
Ground Level: 75.7										
Coordinates: 432868E - 409632N										
Legend:			Remarks:							
D Small Disturbed Sample			Trial pit sides stable.							
B Large Disturbed Sample			Concrete pipe encountered running east-west parallel with culvert at 0.8m bgl. TP moved 2m south to avoid it.							
W Water Sample										
U Undisturbed U100 Sample										
Trial Pit:		TRIAL PIT RECORD				Revision: Final				
TP05		North Gawber Site				Project No. 04014				



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)
	[Cross-hatch pattern]	MADE GROUND (Sparse grass over brown and black clayey sand and gravel of coal and mudstone).	(0.70)		0.50	D			
		MADE GROUND (Black and red angular - elongate fine to coarse gravel of burnt shale, coal and mudstone).	0.70 (0.30) 1.00	80.35 80.05	0.80	D			
1.00			MADE GROUND (Soft red, orange and pale yellow mottled fine ash of burnt shale with some fine coal pockets. Becoming gravel of burnt shale with coal and mudstone from 2.1m).	(1.70)		1.50	D		
2.00				2.70	78.35				
3.00			MADE GROUND (Possibly reworked firm light brown and grey sandy gravelly clay with pockets of gravel and sand. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, siltstone, coal and burnt shale).	(0.40) 3.10 3.30	77.95 77.75				
4.00		Soft and firm brown and grey CLAY/SILT with occasional fine gravel of mudstone. End of Trial Pit at 3.30 m							
5.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 81.1 Coordinates: 432846E - 409691N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides slightly unstable.					
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP06		North Gawber Site				Project No. 04014			



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 (Moist fine sludge of black and red fine sand of coal and burnt shale).	0.20	83.88					
		MADE GROUND (Black slightly clayey sandy gravel. Gravel is fine to coarse, angular to subangular and consists of coal and mudstone).	(0.50)		0.60	D			
1.00			0.70	83.38					
		MADE GROUND (Orange brown fine to coarse sandy gravel of angular to elongate burnt shale and black coal fragments).	(0.60)		1.40	D			
			1.30	82.78					
		MADE GROUND (Possibly reworked orange and light brown silty sand with subangular to subrounded cobbles of sandstone).	(0.50)						
2.00			1.80	82.28					
		MADE GROUND (Possibly reworked firm light orange brown sandy gravelly clay. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, mudstone and rare coal).	(0.50)		2.50	D			
			2.30	81.78					
			(0.70)						
3.00			3.00	81.08					
		Soft and firm grey and black mottled SILT/CLAY.	3.20	80.88					
		Stiff grey and orange mottled sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded and consists of mudstone, sandstone and coal.							
4.00									
		End of Trial Pit at 3.20 m							
5.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 84.1 Coordinates: 432896E - 409738N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides stable. Natural ground observed to slope down to the south within the pit.						
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP07						North Gawber Site			



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	[Cross-hatched pattern]	MADE GROUND (Small trees and wood chip overlying red orange and black fine to coarse, angular to elongate gravel of burnt shale and coal). To 1.5m in south of pit and 2m in north end.	(1.50)		1.00	D			
2.00		MADE GROUND (Stiff grey brown black and yellow sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone and rare sandstone).	1.50	79.92	2.00	D			
3.00			(2.00)						
4.00		End of Trial Pit at 3.50 m	3.50	77.92					
5.00									
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 81.4 Coordinates: 432987E - 409662N				Groundwater: Slight seepage from 1.5m.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides stable. Upper horizon deepening to the north.					
Trial Pit: TP08		TRIAL PIT RECORD				Revision: Final			
		North Gawber Site				Project No. 04014			



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	[Cross-hatch pattern]	MADE GROUND (Stiff dark grey sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of mudstone, coal and sandstone. Contains subangular cobbles of mudstone and sandstone).	(0.90)		0.80	D			
1.00		MADE GROUND (Firm light grey and light brown sandy gravelly clay with dark brown, red and black pockets. Gravel is fine to coarse angular to subangular and consists of sandstone, mudstone, rare coal and burnt shale).	(1.40)	74.46					
2.00	[Dotted pattern]	Stiff light brown and grey sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded and consists of mudstone and sandstone.	2.30	73.06	3.00	D			
3.00			(0.90)						
3.20		End of Trial Pit at 3.20 m	3.20	72.16					
4.00									
5.00									
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 75.4 Coordinates: 433077E - 409579N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides stable.						
Trial Pit: TP09		TRIAL PIT RECORD				Revision: Final			
		North Gawber Site				Project No. 04014			



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	[Cross-hatched pattern]	MADE GROUND (Firm grey sandy gravelly clay with cobbles of sandstone and mudstone. Gravel is fine to coarse angular to subrounded and consists of mudstone, sandstone and coal). (Moderate seepage into pit from 2m with a slight oily sheen and dark spots on top of the standing water).	(3.00)		0.60	D			
2.00					2.50	D			
3.00					End of Trial Pit at 3.00 m		3.00	72.92	
4.00									
5.00									
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 75.9 Coordinates: 433150E - 409563N				Groundwater: Moderate seepage from 2m.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides very unstable throughout.					
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP10						North Gawber Site			

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)
	[Cross-hatched pattern]	MADE GROUND (Firm light brown and grey sandy gravelly clay with subangular cobbles of sandstone and many whole bricks).	(0.80)						
1.00		MADE GROUND (Firm dark brown and black sandy gravelly clay with subangular cobbles of sandstone, siltstone, mudstone and burnt shale. Gravel is fine to coarse, angular to subrounded and consists of sandstone, coal, siltstone, burnt shale and mudstone with rare glass fragments and whole bricks).	(0.60)	94.95					
2.00			(1.40)	94.35					
3.00		MADE GROUND (Dark grey, black and red sand and gravel with occasional subangular cobbles and boulders of sandstone and siltstone. Gravel is fine to coarse, angular to subrounded and consists of sandstone, coal, burnt shale and mudstone. Contains some small clayey pockets and timber fragments).	(1.80)						
		End of Trial Pit at 3.20 m	3.20	92.55					
4.00									
5.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: Ground Level: 95.7 Coordinates: 432987E - 409820N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides becoming unstable from 2m.					
Trial Pit:			TRIAL PIT RECORD			Revision: Final			
TP11						North Gawber Site			Project No. 04014



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 (Rough grass over firm black sandy gravelly clay. Gravel is fine to coarse angular to subrounded and consists of coal, mudstone and siltstone. Occasional timber fragments, railway sleepers, metal pipes and wires).	(0.40)	86.85	0.50	D			
0.40									
1.00		MADE GROUND (North end of trial pit. Black and red sand and gravel of burnt shale, coal and clinker underlain at 0.8m by reinforced concrete).	(1.60)		2.50	D			
1.60		(South end of trial pit, Reinforced concrete partially broken out to 0.8m).							
2.00		(1.5m wide gap between concrete, infilled with red and black sand and gravel of coal and burnt shale).	2.00	85.25					
2.40		MADE GROUND (Orange fine to coarse gravel of clinker and burnt shale).	(0.40)	84.85					
2.80		Soft light brown and grey sandy slightly gravelly CLAY. Gravel is fine to medium and consists of sandstone and mudstone).	(0.40)	84.45					
3.00		End of Trial Pit at 2.80 m	2.80						
4.00									
5.00									

Date of Excavation: 19/08/2004
 Equipment: JCB 3CX
 Logged By: SD
 Ground Level: 87.2
 Coordinates: 433028E - 409762N

Groundwater:
 Slight seepage into the trial pit from 2.6m.

Legend:
 D Small Disturbed Sample
 B Large Disturbed Sample
 W Water Sample
 U Undisturbed U100 Sample

Remarks:
 Trial pit sides unstable above the concrete.

Trial Pit: TP12	TRIAL PIT RECORD	Revision: Final
	North Gawber Site	Project No. 04014



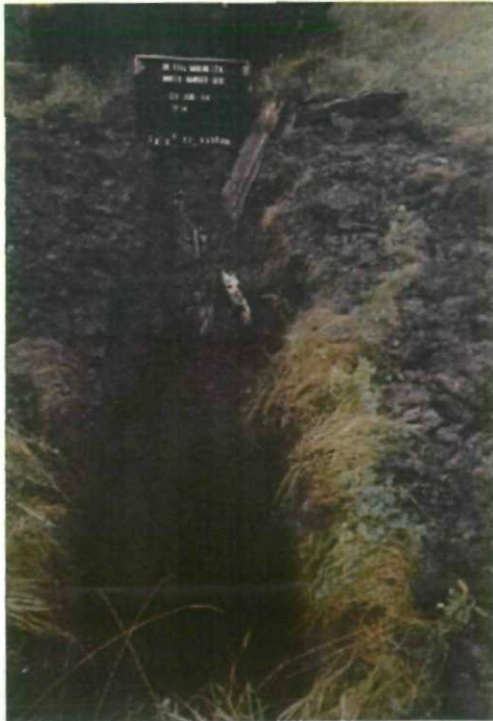
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Strata				Samples		Tests				
Depth (m)	Legend	Description	Strata Depth (Thickness) (m)	Reduced Level (mAOD)	Depth (m)	Type	Depth (m)	MEXE	Shear Vane (Peak/Res)	
0.00	[Cross-hatched pattern]	MADE GROUND (Firm and stiff brown grey black and yellow sandy gravelly clay with many subangular cobbles of coal, mudstone and sandstone. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone and sandstone).	(3.40)		0.90	D				
2.00										
3.00										
3.40		End of Trial Pit at 3.40 m	3.40	81.26						
4.00										
5.00										
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 84.7 Coordinates: 432972E - 409717N				Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides stable.						
Trial Pit: TP13			TRIAL PIT RECORD North Gawber Site			Revision: Final Project No. 04014				



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)
0.60	[Cross-hatched pattern]	MADE GROUND (Grass over firm and stiff black grey and yellow sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone and siltstone).	(3.00)		0.60	D			
2.00									
3.00	[Cross-hatched pattern]	MADE GROUND (Black fibrous material, with strong odour of hydrogen sulphide, plus sheet of steel 50mm thick and thick twisted metal pulley rope approximately 100mm in diameter. End of Trial Pit at 3.30 m	(0.30) 3.30	84.09 83.79	3.00	D			
3.30									
4.00									
5.00									
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 87.1 Coordinates: 433191E - 409684N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides stable to 3m.					
Trial Pit: TP14			TRIAL PIT RECORD North Gawber Site			Revision: Final Project No. 04014			



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	[Cross-hatched pattern]	MADE GROUND (Black fine silty sand of coal and mudstone fines. Moderately strong hydrocarbon odour. Dislodged old metal pipe containing stagnant slightly oily water).	(1.20)		0.50	D			
		MADE GROUND (Soft and firm light brown and grey sandy gravelly clay with coal traces. Not sampled as it was contaminated by the water from the old pipe).	1.20	86.34					
		MADE GROUND (Red and black fine to coarse, angular to subangular sand and gravel of burnt shale, coal and mudstone. Contains metal fragments and some timber). Pocket of white ground chalk or calcium carbonate material at 1.6m.	1.40	86.14	1.60	D			
2.00			(2.10)		2.00	D			
3.00									
		End of Trial Pit at 3.50 m	3.50	84.04					
4.00									
5.00									
Date of Excavation: 19/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 87.5 Coordinates: 433161E - 409705N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides stable. Moderate flow from old metal pipe, not persistent. Pipe was clearly disused.					
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP15						North Gawber Site			



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 (Red black and brown fine to coarse sand and gravel of coal, burnt shale, sandstone and siltstone).	(0.40) 0.40	88.16	0.20	D			
1.00		MADE GROUND (Firm yellow brown grey and black sandy gravelly clay with many sandstone and mudstone cobbles. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone and sandstone).	(2.20)		1.50	D			
2.00			2.60	85.96					
3.00		Light brown and grey very clayey SAND becoming stiff friable light brown and grey sandy slightly gravelly CLAY from 2.8m. Gravel is fine to coarse, subangular to subrounded and consists of sandstone and mudstone.	(0.90)		2.70	D			
4.00		End of Trial Pit at 3.50 m	3.50	85.06					
5.00									
Date of Excavation: 19/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 88.6 Coordinates: 433119E - 409743N					Groundwater: Groundwater not encountered.				
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample					Remarks: Trial pit sides stable.				
Trial Pit:			TRIAL PIT RECORD			Revision: Final			
TP16						Project No. 04014			
			North Gawber Site						



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	[Cross-hatched pattern]	MADE GROUND (Grass over firm black sandy clay with much fine to coarse gravel of coal, sandstone and mudstone. Contains many whole bricks, plastic, wires, large sandstone cobbles, timber fragments and sleepers, concrete kerb stones and black granite sets. Very thick twisted steel cable. Many concrete blocks).	(2.10)	85.46	1.00	D			
2.00					2.10	D			
		End of Trial Pit at 2.10 m							
3.00									
4.00									
5.00									
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 87.6 Coordinates: 433213E - 409697N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides very unstable throughout. Terminated due to concrete obstructions and instability.						
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP17						North Gawber Site			



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	[Cross-hatched pattern]	MADE GROUND (Grass over black and brown clayey sandy gravelly cobbles and boulders of old tarmac and brick. Gravel is fine to coarse and consists of sandstone, brick and mudstone. Slight odour of bitumen from the tarmac. Many large pieces of tarmac with white quartz and limestone gravel)	(1.90)		0.80	D			
2.00		MADE GROUND (Firm brown and grey sandy very gravelly clay with some sandstone cobbles. Gravel is fine to coarse subangular to subrounded and consists of sandstone, siltstone and mudstone).	1.90	88.40					
3.00		Large tarmac obstruction at the base of the pit.	(1.10)		2.50	D			
		End of Trial Pit at 3.00 m	3.00	87.30					
4.00									
5.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 90.3 Coordinates: 433171E - 409738N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides very unstable to 1.9m.						
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP18						North Gawber Site			



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	90.61	0.60	D				
		MADE GROUND (Very hard dark grey cemented slab beneath reinforced concrete).	0.40	90.41						
1.00		MADE GROUND (Black slightly clayey sand and gravel of coal, mudstone, concrete and burnt shale. Contains cobbles of brick, burnt shale and some whole bricks).	(1.10)							
			MADE GROUND (Red sandy gravel of burnt shale with coal traces. Occasional coarse angular to subangular gravel and cobbles of clinker).	1.50	89.31	1.70	D			
2.00				(1.20)						
			MADE GROUND (Orange sand with cobbles of orange clinker).	2.70	88.11	2.80	D			
3.00				2.90	87.91					
		MADE GROUND (Subangular gravel and cobbles of orange clinker).	(0.30)		3.10	D				
			3.20	87.61						
		MADE GROUND (Soft red yellow and brown sandy SILT/CLAY of burnt shale ash).	3.30	87.51	3.20	D				
		End of Trial Pit at 3.30 m								
4.00										
5.00										
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 90.8 Coordinates: 433171E - 409767N			Groundwater: Groundwater not encountered.							
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides unstable throughout.							
Trial Pit: TP19		TRIAL PIT RECORD				Revision: Final				
		North Gawber Site				Project No. 04014				

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)
	[Cross-hatched pattern]	MADE GROUND (Grass over black fine to coarse slightly clayey sandy gravel. Gravel is fine to coarse, angular to subangular and consists of coal and mudstone).	0.20	90.70					
		MADE GROUND (Reinforced concrete).	(0.40)						
1.00		MADE GROUND (Black slightly clayey sand and gravel of coal, sandstone and mudstone).	0.60	90.30					
		MADE GROUND (Black slightly gravelly sand of coal, mudstone, glass, clinker, ash, brick and sandstone. Gravel is fine to medium, angular to subangular. Many large blocks of bricks and mortar and metal wires).	(0.40)						
2.00		MADE GROUND (Black slightly clayey sand and gravel of coal, sandstone and mudstone).	1.00	89.90	1.00	D			
		MADE GROUND (Black slightly gravelly sand of coal, mudstone, glass, clinker, ash, brick and sandstone. Gravel is fine to medium, angular to subangular. Many large blocks of bricks and mortar and metal wires).	(1.60)						
2.00		Large sandstone slab left undisturbed in north end of pit at 1m, approximately 0.8m thick and underlain by red brick wall.							
		End of Trial Pit at 2.60 m	2.60	88.30	2.20	D			
3.00									
4.00									
5.00									
Date of Excavation: 18/08/2004			Groundwater:						
Equipment: JCB 3CX			Groundwater not encountered.						
Logged By: SD									
Ground Level: 90.9									
Coordinates: 433203E - 409755N									
Legend:			Remarks:						
D Small Disturbed Sample			Trial pit sides very unstable below reinforced concrete.						
B Large Disturbed Sample			Trial pit depth restricted by quantity of reinforced concrete.						
W Water Sample									
U Undisturbed U100 Sample									
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP20						Project No. 04014			
		North Gawber Site							



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	[Cross-hatched pattern]	MADE GROUND (Rough grass over light brown and dark brown clayey sand and gravel with cobbles of brick. Many pieces of old tarmac, cut sandstone and granite blocks and old kerb stones).	(1.90)		1.00	D			
2.00		MADE GROUND (Firm friable black and brown sandy gravelly clay with many cobbles of tarmac with white quartz gravel aggregate).	(0.70)	88.32					
3.00		MADE GROUND (Soft and firm light brown and orange sandy gravelly clay with some subangular cobbles of sandstone. Gravel is fine to coarse subangular to subrounded and consists of sandstone, mudstone, coal and siltstone. Becoming friable from 3m.	(0.80)	87.62	2.70	D			
4.00		End of Trial Pit at 3.40 m	3.40	86.82					
5.00									
Date of Excavation: 19/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 90.2 Coordinates: 433225E - 409737N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides unstable to 2.6m					
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP21						North Gawber Site			



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)
	[Cross-hatched pattern]	MADE GROUND (Grass over firm dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded and consists of coal, mudstone and sandstone).	0.20	87.32					
1.00		MADE GROUND (Fine to coarse red brown and black angular to subangular gravel of burnt shale with pockets of fine coal and mudstone gravel).	(1.10)		0.80	D			
	[Dotted pattern]	Possibly reworked light orange brown slightly clayey gravelly SAND with subangular cobbles of sandstone.	1.30	86.22	1.45	D			
2.00		Possible rock head at 2.9m. Weathered orange brown sandstone.	(1.60)						
3.00		End of Trial Pit at 2.90 m	2.90	84.62					
4.00									
5.00									
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 87.5 Coordinates: 433242E - 409706N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Slightly unstable from 1.3m.						
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP22						North Gawber Site			Project No. 04014



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					0.00				
		MADE GROUND (Rough grass over black fine to coarse gravel of coal and mudstone).	0.20	86.95					
		MADE GROUND (Reinforced concrete).	0.40	86.75					
		MADE GROUND (Solid brick foundations underlain by solid concrete floor at 0.8m).	(0.40)						
1.00		End of Trial Pit at 0.80 m	0.80	86.35					
2.00									
3.00									
4.00									
5.00									
Date of Excavation: 19/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 87.1 Coordinates: 433139E - 409723N					Groundwater: Groundwater not encountered.				
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample					Remarks: Trial pit sides stable. Concrete too thick to remove.				
Trial Pit: TP23			TRIAL PIT RECORD North Gawber Site			Revision: Final Project No. 04014			




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 (Black and grey slightly clayey sand and fine to medium gravel of coal and mudstone).	0.20	86.41	0.90	D				
			(0.25)	86.16						
			MADE GROUND (Reinforced concrete).	0.46						86.01
			MADE GROUND (Solid brick foundations).	0.60						
1.00			MADE GROUND (Eastern end of trial pit - solid reinforced concrete approximately 0.6m thick, not broken out. Western end of trial pit - firm black, grey brown and yellow sandy gravelly clay with many mudstone and coal cobbles. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone and sandstone. Occasional timber fragments).	(2.40)						
2.00					2.70	D				
3.00		End of Trial Pit at 3.00 m	3.00	83.61						
4.00										
5.00										
Date of Excavation: 19/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 86.6 Coordinates: 433111E - 409711N			Groundwater: Groundwater not encountered.							
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides slightly unstable from 2.1m. Terminated at maximum reach due to reinforced concrete encountered at 0.6m.							
Trial Pit:		TRIAL PIT RECORD				Revision: Final				
TP24						North Gawber Site			Project No. 04014	

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 (Firm black sandy gravelly clay becoming clayey sand and gravel from 0.5m. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone, sandstone and brick. Thick steel girders approximately 2m long, Wooden pit props, thick twisted steel ropes. Many whole bricks). Red brick wall in southern side of trial pit.	(1.50)		1.00	D			
1.50		End of Trial Pit at 1.50 m	1.50	85.19					
2.00									
3.00									
4.00									
5.00									
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 86.7 Coordinates: 433077E - 409696N			Groundwater: Groundwater not encountered.						
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample			Remarks: Trial pit sides very unstable. Possibly old air shaft or mine entrance, fill very loose. Brick wall along southern side of pit.						
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP25						Project No. 04014			
		North Gawber Site							



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 (Black fine moist gravelly sand of coal and mudstone).	0.20	85.72	0.45	D			
1.00		MADE GROUND (Firm grey, black, brown and yellow slightly sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal and mudstone. Also contains tabular cobbles of sandstone and mudstone).	(3.40)						
2.00									
3.00					3.10	D			
4.00		End of Trial Pit at 3.60 m	3.60	82.32					
5.00									
Date of Excavation: 19/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 85.9 Coordinates: 433061E - 409724N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides stable.					
Trial Pit: TP26			TRIAL PIT RECORD			Revision: Final			
			North Gawber Site			Project No. 04014			



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	[Cross-hatched pattern]	MADE GROUND (Brown and grey very clayey sand and gravel. Gravel is fine to coarse, angular to subrounded and consists of mudstone and coal with pockets of burnt shale gravel. Occasional cobbles of clinker).	(1.00)	89.63	0.50	D			
1.00			1.00		1.00	D			
1.50	[Dotted pattern]	MADE GROUND (Orange brown sandy gravel. Gravel is fine to coarse angular elongate and consists of clinker, brick, burnt shale and mudstone. Many whole bricks and cobbles of clinker).	(1.90)		1.60	D			
2.00					1.80	1.80	D		
2.50		Light yellow brown clayey SAND in northern end of trial pit, probably not made ground.							
2.90			2.90	87.73					
3.00		End of Trial Pit at 2.90 m							
4.00									
5.00									
Date of Excavation: 18/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 90.6 Coordinates: 433070E - 409774N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides very unstable. Metal pipe encountered but not damaged in northern end of trial pit.					
Trial Pit:		TRIAL PIT RECORD				Revision: Final			
TP27						North Gawber Site			



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	[Cross-hatched pattern]	MADE GROUND (Firm black, brown, grey and yellow sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal, sandstone and mudstone).	(1.40)		1.00	D			
2.00		MADE GROUND (Red, brown and yellow sandy gravel of burnt shale. Gravel is fine to coarse, angular to elongate).	1.40	83.59	1.80	D			
3.00		MADE GROUND (Black, fine to coarse, angular to subrounded sand and gravel of coal, mudstone, sandstone and clinker with pockets of silver coloured coke works slag).	(0.90)	82.69	2.50 2.60	D D			
4.00		End of Trial Pit at 3.40 m	(1.10)						
5.00			3.40	81.59					
Date of Excavation: 20/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 85.0 Coordinates: 433152E - 409689N					Groundwater: Groundwater not encountered.				
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample					Remarks: Trial pit sides unstable.				
Trial Pit: TP28			TRIAL PIT RECORD North Gawber Site			Revision: Final Project No. 04014			 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)
		MADE GROUND (Grass over firm brown sandy gravelly clay. Gravel is fine to coarse, subangular and consists of mudstone, yellow limestone and sandstone. Many railway sleepers with creosote odour).	(0.30)	87.34					
1.00		MADE GROUND (Black fine to coarse, angular to subangular sand and gravel of coal, mudstone, sandstone and brick. Contains many old wires, plastic and rubber pipes).	(1.80)		1.00	D			
2.00		MADE GROUND (Red, yellow and brown fine to coarse, angular to elongate slightly sandy gravel of burnt shale).	(1.00)	85.54	2.30	D			
3.00		End of Trial Pit at 3.10 m	3.10	84.54					
4.00									
5.00									
Date of Excavation: 19/08/2004 Equipment: JCB 3CX Logged By: SD Ground Level: 87.6 Coordinates: 433161E - 409717N				Groundwater: Groundwater not encountered.					
Legend: D Small Disturbed Sample B Large Disturbed Sample W Water Sample U Undisturbed U100 Sample				Remarks: Trial pit sides very unstable from 2.1m.					
Trial Pit:		TRIAL PIT RECORD North Gawber Site				Revision: Final			
TP29						Project No. 04014			



APPENDIX F
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	
0.00		MADE GROUND (Firm greyish brown, black and red mottled sandy gravelly clay. Gravel is fine to coarse, angular to subrounded and consists of red burnt shale, coal, mudstone, sandstone and brick. Occasional cobbles of mudstone. Driller records occasional boulders).	(4.60)		2.00	B D					
4.00					B D						
4.60						66.45					
4.70		Moderately weathered, moderately weak, thinly bedded orange and brown fine grained SANDSTONE/SILTSTONE.	(0.40)		4.70-5.00	B					
5.00		End of Borehole at 5.00 m	5.00	66.05							
6.00											
7.00											
8.00											
9.00											
Start Date: 19/08/2004 End Date: 19/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 71.0 mAOD Coordinates: 433071E - 409398N		Chiselling: 4.10m to 4.30m : 0.5 hr 4.70m to 5.00m : 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: BH01		BOREHOLE RECORD				Revision: Final					
		North Gawber Site				Project No. 04014					




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 (Firm brown, grey and black sandy gravelly clay. Gravel is fine to coarse angular to subrounded and consists of burnt shale, coal, mudstone and sandstone. Less gravel and burnt shale with depth. Occasional subangular mudstone cobbles and boulders).									
1.00											
2.00							2.00	B D			
3.00											
4.00					(6.20)		4.00	B			
5.00											
6.00							6.00	B D			
7.00											
8.00					8.20	65.62	8.00	B			
8.20				MADE GROUND (Wood) (Driller's description).	8.40	65.42					
8.40			8.50	65.32							
8.50		MADE GROUND (Firm and soft dark brown and grey slightly peaty sandy gravelly clay. Gravel consists of coal and mudstone. Possibly old topsoil).	(0.60)		8.50-9.20 8.50	B D					
9.10		Firm light brown and grey mottled sandy gravelly CLAY. Gravel is fine to coarse, angular to subrounded and consists of sandstone, mudstone and rare coal. Occasional sandstone cobbles.	9.10	64.72							
9.40			(0.40)								
9.50			9.50	64.32							
Moderately weathered, weak, yellow and Continued next sheet											
Start Date: 19/08/2004 End Date: 19/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 73.8 mAOD Coordinates: 432984E - 409478N		Chiselling: 4.30m to 4.60m : 0.5 hr 5.10m to 5.40m : 0.5 hr 8.20m to 8.40m : 0.25 hr 9.20m to 9.50m : 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: BH02		BOREHOLE RECORD North Gawber Site				Revision: Final Project No. 04014			 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
		brown fine grained SANDSTONE. End of Borehole at 9.50 m								
11.00										
12.00										
13.00										
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										

Start Date: 19/08/2004 End Date: 19/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 73.8 mAOD Coordinates: 432984E - 409478N	Chiselling: 4.30m to 4.60m : 0.5 hr 5.10m to 5.40m : 0.5 hr 6.20m to 6.40m : 0.25 hr 9.20m to 9.50m : 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)
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Remarks:

Borehole: BH02	BOREHOLE RECORD		Revision: Final	 SCOTT DOHERTY ASSOCIATES
	North Gawber Site		Project No. 04014	



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 - 4.20		MADE GROUND (Reddish brown, grey and black very sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of burnt shale, coal and mudstone).									
4.20 - 4.50		Firm, possibly reworked, grey and light brown mottled black sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded and consists of sandstone, mudstone and rare coal.	4.20 (0.30) 4.50	70.96 70.66	2.00 4.00 4.20	B D B					
4.50 - 5.00		Moderately weathered weak orange brown fine grained SANDSTONE.	(0.50) 5.00	 70.16							
		End of Borehole at 5.00 m									

Start Date: 19/08/2004	Chiselling: 1.30m to 1.70m : 0.5 hr 4.60m to 5.00m : 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)
End Date: 19/08/2004			
Method: DANDO 2000			
Drilled By: J.B. Site Investigations.			
Logged By:			
Ground Level: 75.2 mAOD			
Coordinates: 432900E - 409553N			

Remarks:

Borehole: BH03	BOREHOLE RECORD		Revision: Final
	North Gawber Site		Project No. 04014



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 (Firm and soft grey and black sandy gravelly clay. Gravel is fine to coarse, angular to subrounded and consists of coal and mudstone).	(2.60)							
2.00					2.00	B D				
2.60			2.60	72.98						
2.80		MADE GROUND (Probably rubber matting/ conveyor belt. No returns).	2.80	72.78						
3.00		End of Borehole at 2.80 m								
4.00										
5.00										
6.00										
7.00										
8.00										
9.00										

Start Date: 20/08/2004
 End Date: 20/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 75.6 mAOD
 Coordinates: 432817E - 409634N

Chiselling:
 2.60m to 2.80m : 0.75 hr

Water Strikes:
 1.80m. Rose to 1.30m after 20 mins

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:
 Obstruction encountered, moved to BH04A

Borehole:
 BH04

BOREHOLE RECORD
 North Gawber Site

Revision: Final
 Project No. 04014



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 (Soft grey and black sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal and mudstone with occasional siltstone).								
1.00										
2.00			(3.60)		2.00	B D				
3.00										
3.60			3.60	71.60						
3.70		MADE GROUND (Hard obstruction, possibly steel).	3.70	71.50						
4.00		End of Borehole at 3.70 m								
5.00										
6.00										
7.00										
8.00										
9.00										

Start Date: 20/08/2004
 End Date: 20/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 75.2 mAOD
 Coordinates: 432841E - 409623N

Chiselling:
 3.60m to 3.70m : 0.75 hr

Water Strikes:
 1.80m.

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:
 Obstruction encountered, moved to BH04B

Borehole:
 BH04A

BOREHOLE RECORD
 North Gawber Site

Revision: Final
 Project No. 04014



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 (Same material as BH04A).								
1.00										
2.00			(3.00)							
3.00			3.00	72.48						
		MADE GROUND (Hard obstruction).	3.20	72.28						
		End of Borehole at 3.20 m								
4.00										
5.00										
6.00										
7.00										
8.00										
9.00										

Start Date: 20/08/2004
 End Date: 20/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 75.5 mAOD
 Coordinates: 432825E - 409630N

Chiselling:
 2.00m to 2.30m : 0.25 hr
 3.00m to 3.20m : 0.75 hr

Water Strikes:
 1.80m.

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:
 Obstruction encountered moved to BHO4C

Borehole:
 BH04B



BOREHOLE RECORD

North Gawber Site

Revision: Final

Project No. 04014



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 (Soft and firm brown and black sandy gravelly clay. Gravel is fine to coarse, angular to subrounded and consists of mudstone, coal, pottery and brick).								
1.00										
2.00			(3.60)		2.00	B D				
3.00										
4.00		Highly weathered thinly bedded orange brown fine grained SANDSTONE/SILTSTONE.	3.60	71.88						
			(0.80)		4.00	B D				
		End of Borehole at 4.40 m	4.40	71.08						
5.00										
6.00										
7.00										
8.00										
9.00										

Start Date: 20/08/2004
 End Date: 20/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 75.5 mAOD
 Coordinates: 432826E - 409630N

Chiselling:
 3.10m to 3.30m : 0.5 hr
 4.00m to 4.40m : 0.75 hr

Water Strikes:
 1.80m.

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:
 BH04C

BOREHOLE RECORD





North Gawber Site





Revision: Final

Project No. 04014



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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 (Firm and soft grey, brown and black sandy gravelly clay. Gravel is fine to coarse angular to subrounded and consists of sandstone, coal, mudstone, occasional burnt shale and brick. Contains boulders of mudstone and sandstone).	(4.50)	88.15	2.00	B D					
4.00					B D						
4.50					B D						
5.00											
5.00		Firm and stiff light brown dark brown and grey sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, mudstone and rare coal.	(0.50)								
5.00		Moderately weathered very weak orange brown fine grained SANDSTONE/SILTSTONE	(0.40)	67.25							
5.40		End of Borehole at 5.40 m									
6.00											
7.00											
8.00											
9.00											
Start Date: 23/08/2004 End Date: 23/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 72.6 mAOD Coordinates: 433094E - 409509N			Chiselling: 2.30m to 2.60m : 0.75 hr 5.00m to 5.40m : 0.5 hr		Water Strikes: 2.55m. Rose to 2.30m after 20 mins			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: BH05		BOREHOLE RECORD				Revision: Final			 SCOTT DOHERTY ASSOCIATES		
		North Gawber Site				Project No. 04014					

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 (Dark grey and black very clayey sandy gravel. Gravel is fine to coarse, angular to subrounded and consists of sandstone, mudstone, hard siltstone and coal. Occasional cobbles of mudstone).	(3.60)		2.00	B D					
2.00											
3.00											
4.00											
4.00		Firm and stiff light brown and grey sandy gravelly CLAY. Gravel is fine to medium and consists of sandstone, coal and mudstone.	(0.70)		3.50	B D					
4.30			4.30	72.95							
4.40		Moderately weathered thinly bedded orange brown fine grained SANDSTONE.	(0.40)								
4.70			4.70	72.55							
5.00		End of Borehole at 4.70 m									
6.00											
7.00											
8.00											
9.00											
Start Date: 23/08/2004 End Date: 23/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 77.2 mAOD Coordinates: 432987E - 409603N			Chiselling: 4.40m to 4.70m : 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: BH06		BOREHOLE RECORD				Revision: Final					
		North Gawber Site				Project No. 04014					

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 (Red angular to subangular sand and gravel of burnt shale).	(0.30)	83.33						
1.00		MADE GROUND (Stiff black grey and yellowish brown sandy gravelly clay. Gravel is fine to coarse angular to subangular and consists of mudstone, coal and sandstone).								
2.00			(3.60)		2.00	B D				
4.00		Stiff, firm in places, light brown and grey sandy gravelly CLAY. Gravel is fine to medium, subangular to subrounded and consists of sandstone and mudstone.	3.90	79.73	4.00	B D				
5.00			(2.50)							
6.00			6.40	77.23	6.00	B				
7.00		Highly weathered very weak thinly bedded brown and grey, SILTSTONE.	(1.60)		7.50	D				
8.00			8.00	75.63						
9.00		End of Borehole at 8.00 m								
Start Date: 25/08/2004		Chiselling:		Water Strikes:			Legend:			
End Date: 25/08/2004		1.40m to 1.80m : 0.5 hr		No Groundwater Encountered			D Small Disturbed Sample			
Method: DANDO 2000		2.30m to 2.50m : 0.75 hr					B Large Disturbed Sample			
Drilled By: J.B. Site Investigations.		7.60m to 8.00m : 0.75 hr					U Undisturbed U100 Sample			
Logged By: SD							W Water Sample			
Ground Level: 83.6 mAOD							S Standard Penetration Test (Split Spoon)			
Coordinates: 432920E - 409697N							C Standard Penetration Test (Cone)			
Remarks:										
Borehole:		BOREHOLE RECORD				Revision: Final		 SCOTT DOHERTY ASSOCIATES		
BH07						North Gawber Site				

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	[Cross-hatch pattern]	MADE GROUND (Firm and stiff brown and black, mottled red sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal, burnt shale, mudstone and sandstone.								
1.00										
2.00			(3.90)		2.00	B D				
3.00										
3.90			3.90	80.53						
4.00	[Dotted pattern]	Soft brown and grey slightly sandy SILT/CLAY.	4.00	80.43	3.90	D				
4.00					4.00	B D				
4.40	[Cross-hatch pattern]	Firm and stiff light brown and grey sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, mudstone and rare coal.	(0.40)							
4.40			4.40	80.03						
5.00	[Cross-hatch pattern]	Highly weathered very weak orange brown SILTSTONE becoming moderately weathered from 5.6m.			5.00	D				
5.60			(1.60)							
6.00		End of Borehole at 6.00 m	6.00	78.43						
7.00										
8.00										
9.00										

Start Date: 25/08/2004
 End Date: 25/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 84.4 mAOD
 Coordinates: 432814E - 409742N

Chiselling:
 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:
 BH08

BOREHOLE RECORD

North Gawber Site

Revision: Final

Project No. 04014



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	[Cross-hatch pattern]	MADE GROUND (Rough grass over firm brown red and black mottled sandy gravelly clay. Gravel is fine to coarse angular to subangular and consists of coal, mudstone, burnt shale and brick).	(1.30)							
1.00				1.30	78.05					
2.00	[Cross-hatch pattern]	MADE GROUND (Red orange and brown fine to coarse angular to subangular and elongated sand and gravel of burnt shale).	(2.50)		2.00	B D				
3.00										
4.00	[Stippled pattern]	Firm light brown and grey sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded and consists of sandstone, mudstone and rare coal. Occasional subrounded cobbles of sandstone.	(0.90)		4.00	B D				
5.00										
6.00	[X pattern]	Highly weathered weak thinly bedded orange brown SILTSTONE.	(1.30)		5.50	B D				
7.00										
8.00		End of Borehole at 6.00 m	6.00	73.35						
9.00										


Start Date: 27/08/2004	Chiselling: 1.50m to 1.80m : 0.5 hr 2.40m to 2.80m : 0.75 hr 5.60m to 6.00m : 0.75 hr	Water Strikes: 3.60m.	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)
End Date: 27/08/2004			
Method: DANDO 2000			
Drilled By: J.B. Site Investigations.			
Logged By: SD			
Ground Level: 79.3 mAOD			
Coordinates: 433115E - 409609N			


Remarks:

Borehole: BH09	BOREHOLE RECORD		Revision: Final
	North Gawber Site		Project No. 04014



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	
0.00		MADE GROUND (Firm sand soft brown, black and grey mottled orange yellow sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone and sandstone).	(2.80)								
2.00					2.00	B D					
2.80			2.80	82.88							
3.00		MADE GROUND (Black fine to medium angular to subangular sand and gravel of coal and burnt shale with mudstone fragments).									
4.00					4.00	B D					
5.80				(5.80)							
6.00					6.00	B D					
8.00					8.00	B					
8.50			8.60	77.08	8.50	D					
9.00		Stiff light brown and grey sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded and consists of sandstone, coal and mudstone.	(0.50)								
		Highly weathered very weak brown and grey MUDSTONE.	(0.90)								
		Continued next sheet	10.00	75.68							
Start Date: 25/08/2004 End Date: 25/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 85.7 mAOD Coordinates: 433040E - 409703N		Chiselling: 1.80m to 1.80m : 0.5 hr 10.40m to 10.80m : 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: BH10		BOREHOLE RECORD					Revision: Final				
		North Gawber Site					Project No. 04014				

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	
		End of Borehole at 10.80 m			10.00	B					
11.00											
12.00											
13.00											
14.00											
15.00											
16.00											
17.00											
18.00											
19.00											
Start Date: 25/08/2004 End Date: 25/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 85.7 mAOD Coordinates: 433040E - 406703N		Chiselling: 1.60m to 1.80m : 0.5 hr 10.40m to 10.80m : 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: BH10		BOREHOLE RECORD					Revision: Final				
		North Gawber Site					Project No. 04014				
											

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 (Compacted light yellow brown limestone hardcore).	(0.30)	87.05							
1.00		MADE GROUND (Firm brown and grey sandy gravelly clay. Gravel is fine to coarse angular to subangular and consists of mudstone and rare fine coal. Contains subangular cobbles of mudstone).									
2.00			(3.20)		2.00	B D					
3.00			3.50	83.85							
4.00		Stiff light brown and grey sandy gravelly CLAY. Gravel is fine to coarse subangular to rounded and consists of sandstone mudstone and coal.	(0.40)	83.45	3.80	B					
		Highly to moderately weathered very weak brown and grey MUDSTONE.	3.90	83.45	4.00	D					
5.00			(1.10)								
		End of Borehole at 5.00 m	5.00	82.35							
6.00											
7.00											
8.00											
9.00											
Start Date: 24/08/2004 End Date: 24/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 87.4 mAOD Coordinates: 432958E - 409763N		Chiselling: 2.80m to 2.90m : 0.5 hr 4.60m to 5.00m : 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: BH11		BOREHOLE RECORD				Revision: Final					
		North Gawber Site				Project No. 04014					

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								
0.00	[Cross-hatched pattern]	MADE GROUND (Firm black, brown grey and red sandy very gravelly clay to clayey gravel. Gravel is fine to coarse, angular to subangular and consists of sandstone, coal, brick and mudstone with pockets of burnt shale).	(3.30)	91.16	2.00	B D												
1.00																		
2.00																		
3.00																		
4.00	[Cross-hatched pattern]	MADE GROUND (Firm and stiff grey brown and black sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal, sandstone, mudstone and burnt shale. Occasional subangular cobbles and boulders of mudstone).	(10.50)		4.00	B												
5.00																		
6.00																		
7.00																		
8.00					8.00	B												
9.00																		

Continued next sheet

Start Date: 23/08/2004
 End Date: 23/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 94.5 mAOD
 Coordinates: 432889E - 409818N

Chiselling:
 4.20m to 4.20m : 0.25 hr
 5.60m to 5.80m : 0.5 hr
 13.80m to 14.10m : 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:
 BH12



BOREHOLE RECORD

North Gawber Site

Revision: Final

Project No. 04014



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
10.00		MADE GROUND (Firm and stiff grey brown and black sandy gravelly clay. Gravel is fine to coarse, angular to subangular and consists of coal, sandstone, mudstone and burnt shale. Occasional subangular cobbles and boulders of mudstone).			10.00	B D				
11.00										
12.00										
13.00										
13.80			13.80	80.66						
14.00		Moderately weathered weak brown and grey MUDSTONE.	(0.30) 14.10	80.36	14.00	D				
		End of Borehole at 14.10 m								
15.00										
16.00										
17.00										
18.00										
19.00										

Start Date: 23/08/2004
 End Date: 23/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 94.5 mAOD
 Coordinates: 43289E - 409818N

Chiselling:
 4.20m to 4.20m : 0.25 hr
 5.80m to 5.80m : 0.5 hr
 13.80m to 14.10m : 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:
 BH12

BOREHOLE RECORD


North Gawber Site



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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 (Firm grey red and black sandy gravelly clay. Gravel is fine to coarse angular to subrounded and consists of coal, mudstone and burnt shale).	(1.40)							
2.00		MADE GROUND (Black red and brown slightly clayey sand and gravel of coal, burnt shale and silver coloured coke works slag).	1.40	77.65	2.00	B D				
3.00			(2.20)							
4.00		Stiff light brown and grey sandy gravelly CLAY. Gravel is fine to coarse, subangular to rounded and consists of sandstone and mudstone. Occasional subrounded mudstone and sandstone cobbles.	3.60	75.45	3.60	D				
5.00			(1.10)		4.00	B				
		Highly weathered very weak orange brown SILTSTONE.	4.70	74.35						
			(0.60)							
		End of Borehole at 5.30 m	5.30	73.75						
6.00										
7.00										
8.00										
9.00										
Start Date: 27/08/2004		Chiselling: 5.00m to 5.30m : 0.75 hr		Water Strikes: 3.60m.		Legend:				
End Date: 27/08/2004						D Small Disturbed Sample				
Method: DANDO 2000						B Large Disturbed Sample				
Drilled By: J.B. Site Investigations.						U Undisturbed U100 Sample				
Logged By: SD						W Water Sample				
Ground Level: 79.1 mAOD						S Standard Penetration Test (Split Spoon)				
Coordinates: 433190E - 409594N						C Standard Penetration Test (Cone)				
Remarks: Moist at the base of the made ground.										
Borehole: BH13		BOREHOLE RECORD				Revision: Final				
		North Gawber Site				Project No. 04014				



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 - 1.80		MADE GROUND (Black angular to subangular sand and gravel of coal, burnt shale and mudstone).	(1.80)							
1.80 - 2.00		MADE GROUND (Red and black sand and gravel of burnt shale).	1.80	81.75	2.00	B D				
2.00 - 3.50		MADE GROUND (Black fine ash of coal and burnt shale with much silver coloured coke works slag).	2.00	81.55						
3.50 - 3.60		MADE GROUND (Black fine ash of coal and burnt shale with much silver coloured coke works slag).	(1.50)		3.40	B D				
3.60 - 3.60		MADE GROUND (Obstruction, probably reinforced concrete - no returns).	3.50	80.05						
3.60 - 3.60		End of Borehole at 3.60 m	3.60	79.95						
3.60 - 9.00										
Start Date: 26/08/2004 End Date: 26/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: 83.6 mAOD Coordinates: 433173E - 409645N			Chiselling: 3.50m to 3.60m : 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: BH14		BOREHOLE RECORD				Revision: Final				
		North Gawber Site				Project No. 04014				


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 (Firm grey colliery fill) (Driller's description)	0.20							
		End of Borehole at 0.20 m								
1.00										
2.00										
3.00										
4.00										
5.00										
6.00										
7.00										
8.00										
9.00										
Start Date: 28/08/2004 End Date: 28/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: - Coordinates: -		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: Concrete obstruction.										
Borehole: BH15		BOREHOLE RECORD				Revision: Final		 SCOTT DOHERTY ASSOCIATES		
		North Gawber Site				Project No. 04014				

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	
	XXXXXX	MADE GROUND (Firm colliery fill) (Drillers description).	0.20								
		End of Borehole at 0.20 m									
1.00											
2.00											
3.00											
4.00											
5.00											
6.00											
7.00											
8.00											
9.00											
Start Date: 26/08/2004 End Date: 26/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: - Coordinates: -		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: Concrete obstruction.											
Borehole: BH15A		BOREHOLE RECORD North Gawber Site					Revision: Final Project No. 04014				





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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 (Firm grey colliery fill) (Driller's description)	(0.25)	0.25							
		End of Borehole at 0.25 m									
1.00											
2.00											
3.00											
4.00											
5.00											
6.00											
7.00											
8.00											
9.00											
Start Date: 26/08/2004 End Date: 26/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: - Coordinates: -		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: Concrete obstruction.											
Borehole: BH15B		BOREHOLE RECORD North Gawber Site				Revision: Final Project No. 04014					

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 (Firm grey colliery fill) (Drillers description).	(0.40) 0.40								
		End of Borehole at 0.40 m									
1.00											
2.00											
3.00											
4.00											
5.00											
6.00											
7.00											
8.00											
9.00											
Start Date: 26/08/2004 End Date: 26/08/2004 Method: DANDO 2000 Drilled By: J.B. Site Investigations. Logged By: SD Ground Level: - Coordinates: -		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: Concrete obstruction.											
Borehole: BH15C		BOREHOLE RECORD North Gawber Site				Revision: Final		Project No. 04014			



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
1.00		MADE GROUND (Black fine angular to subangular sand and gravel of coal and mudstone).	(2.00)							
2.00		MADE GROUND (Obstruction - probably reinforced concrete).	2.00	85.55	2.00	D B				
		End of Borehole at 2.10 m	2.10	85.45						
3.00										
4.00										
5.00										
6.00										
7.00										
8.00										
9.00										

Start Date: 26/08/2004
 End Date: 26/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 87.5 mAOD
 Coordinates: 433139E - 409683N

Chiselling:
 2.00m to 2.10m : 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:
 Following completion of the borehole a 0.7m thick concrete foundation was observed partially exposed approximately 2m down slope.

Borehole:
 BH15D

BOREHOLE RECORD

North Gawber Site

Revision: Final

Project No. 04014



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 (Black brown mottled red and orange very clayey sand and gravel. Gravel is fine to coarse, angular to subangular and consists of coal, mudstone and burnt shale. From 3.6m becoming fine sand and gravel of coal ash).									
1.00											
2.00			(4.20)		2.00	B D					
3.00											
4.00			4.20	82.17	4.00	B D					
5.00		Firm and stiff light brown and grey sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded and consists of sandstone, mudstone and coal.	(1.20)		5.00	B					
6.00		Moderately weathered weak orange brown thinly bedded SILTSTONE.	5.40	80.97	5.40	D					
6.40		End of Borehole at 6.40 m	(1.00)								
7.00			6.40	79.97							
8.00											
9.00											
Start Date: 25/08/2004 End Date: 25/08/2004 Method: Drilled By: J.B. Site Investigations. Logged By: Ground Level: 86.4 mAOD Coordinates: 433089E - 408734N		Chiselling: 6.00m to 6.40m : 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: BH16		BOREHOLE RECORD					Revision: Final				
		North Gawber Site					Project No. 04014				
 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
1.00	[Cross-hatch pattern]	MADE GROUND (Stiff black brown and grey sandy gravelly clay. Gravel is fine to coarse angular to subangular and consists of coal, mudstone and sandstone).	(1.50)							
2.00		MADE GROUND (Red fine to coarse, angular to subangular and elongate sand and gravel of burnt shale and coal).	1.50	82.57	1.60	D				
3.00	[Cross-hatch pattern]		(2.30)		2.00	B				
4.00		MADE GROUND (Soft and firm, moist light brown and grey sandy clay with pockets of black and brown mudstone and coal).	3.80	80.27	4.00	B D				
5.00	[Cross-hatch pattern]	Firm and stiff light brown and grey sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded and consists of sandstone and mudstone.	(0.60)	79.67	4.50	D				
6.00		Highly weathered very weak thinly bedded orange and brown SILTSTONE/SANDSTONE.	5.00	79.07	6.00	B				
	[Cross-hatch pattern]		(1.40)							
		End of Borehole at 6.40 m	6.40	77.67						

Start Date: 26/08/2004	Chiselling: 1.70m to 2.10m : 0.75 hr 6.00m to 6.40m : 0.75 hr	Water Strikes: 4.40m.	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)
End Date: 26/08/2004			
Method: DANDO 2000			
Drilled By: J.B. Site Investigations.			
Logged By: SD			
Ground Level: 84.1 mAOD			
Coordinates: 433235E - 409854N			

Remarks:
Moist at the base of the made ground.

Borehole: BH17	BOREHOLE RECORD	Revision: Final	
	North Gawber Site	Project No. 04014	

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 (Firm brown and black sandy gravelly clay becoming clayey sand and gravel. Gravel is fine to coarse, angular to subangular and consists of coal, brick, concrete, mudstone, burnt shale and sandstone. Contains angular to subangular cobbles and boulders of sandstone, concrete and brick).	(2.80)							
2.00						2.00	B D			
3.00		MADE GROUND (Firm brown black yellow and red sandy gravelly clay to clayey sand and gravel. Gravel is fine to coarse, angular to subangular and consists of coal, brick, concrete, sandstone and burnt shale).	2.80	87.60						
4.00						4.00	B D			
5.00					(4.60)					
6.00		Stiff light brown and grey sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded and consists of sandstone and mudstone. Occasional subangular cobbles of sandstone.	7.40	83.00	7.40	D				
7.00				(0.40)						
8.00		Highly weathered weak fine grained orange brown SANDSTONE/SILTSTONE	7.80	82.60	7.80	D				
8.00				(0.70)		8.00	B			
9.00		End of Borehole at 8.50 m	8.50	81.90						

Start Date: 24/08/2004
 End Date: 24/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 90.4 mAOD
 Coordinates: 433210E - 409738N

Chiselling:
 1.10m to 1.50m : 0.5 hr
 8.10m to 8.50m : 0.75 hr

Water Strikes:
 7.20m.

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:

BH18




BOREHOLE RECORD

North Gawber Site

Revision: Final

Project No. 04014



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 (Firm dark brown red and black sandy gravelly clay. Gravel is fine to coarse, angular to subrounded and consists of brick, mudstone, coal, sandstone and concrete fragments).									
1.00											
2.00											B D
3.00											(5.40)
4.00	B										
5.00			5.40	85.27	5.40	D					
6.00		Stiff light brown and grey sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded and consists of sandstone and mudstone.									
6.00											B
7.00		Moderately weathered brown and grey MUDSTONE becoming weathered brown SILTSTONE with depth.									
7.00											(1.10)
8.00		End of Borehole at 7.80 m	7.80	82.87	7.80	D					
9.00											

Start Date: 24/08/2004
 End Date: 24/08/2004
 Method: DANDO
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 90.7 mAOD
 Coordinates: 433143E - 409753N

Chiselling:
 6.60m to 7.00m : 0.5 hr
 7.40m to 7.80m : 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: BH19	BOREHOLE RECORD		Revision: Final
	North Gawber Site		Project No. 04014



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 (Dark brown black and grey sandy gravelly clay. Gravel is fine to coarse angular to subangular and consists of coal, sandstone and mudstone. Occasional subangular cobbles of grey mudstone).	(6.30)		2.00	B D				
4.00					B D					
6.00					B					
6.30					D					
7.00		Stiff light brown sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded and consists of sandstone and mudstone.	(1.90)	84.86	6.30					
8.00					B					
8.20		Moderately weathered weak brown and grey MUDSTONE.	(0.60)	82.96	8.20					
8.80										
9.00		End of Borehole at 8.80 m								

Start Date: 24/08/2004
 End Date: 24/08/2004
 Method: DANDO 2000
 Drilled By: J.B. Site Investigations.
 Logged By: SD
 Ground Level: 91.2 mAOD
 Coordinates: 433047E - 409818N

Chiselling:
 2.10m to 2.40m : 0.5 hr
 8.50m to 8.80m : 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:
 BH20

BOREHOLE RECORD

North Gawber Site

Revision: Final

Project No. 04014



APPENDIX G
LABORATORY TEST CERTIFICATES

dets

Derwentside Environmental Testing Services



CERTIFICATE OF ANALYSIS

Certificate Number : 14002

Client Reference : 04014

16 September 2004

Our Reference : 14002

Clients Name : Scott Doherty Associates
Clients Address: Derwentside Business Centre
Consett Business Park
Consett
Co Durham
DH8 6BP

Contract Title : North Gawber Surface Mining Scheme

Description : Twenty seven soil samples

Date Received : 31 August 2004

Test Procedures : Identified by Prefix DETSn , Details available upon request.

Notes : TP20 @2.20m contains coal and has a high TEM value

* Denotes test not included in laboratory scope of accreditation

Observations and Interpretations are Outside the UKAS Accreditation Scope

Approved By:

Authorised Signatories R Bennett
Director

R Brown
Laboratory/Technical Manager

S Wilson
Quality Manager

Page 1 of 6 Pages

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Derwentside Environmental Testing Services Limited.
Unit 2a/2b, Park Road Industrial Estate South, Consett, Co Durham. DH8 5PY
Tel: 01207 582333 • Fax: 01207 582444 • Email: info@dets.co.uk • www.dets.co.uk

Registered in England No. 370 5645 • VAT No. 708 978 678

NORTH GAWBER SURFACE MINING SCHEME

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Total	Total	Total	Total	Total	Total	Total	Total	Water Soluble
					Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (B)
					(mg/kg As)	(mg/kg Cd)	(mg/kg Cr)	(mg/kg Pb)	(mg/kg Hg)	(mg/kg Se)	(mg/kg Cu)	(mg/kg Ni)	(mg/kg Zn)	(mg/kg)
					DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
TP 1	0.40			14002/1	5	0.7	14	21	<0.3	2.3	25	22	78	0.6
TP 1	2.90			14002/2	9	1.4	15	25	<0.3	1.5	28	30	97	0.4
TP 2	1.90			14002/3	22	0.4	11	26	<0.3	1.8	34	22	74	0.8
TP 2	2.80			14002/4	8	1.2	16	27	<0.3	1.6	14	9	74	0.8
TP 3	1.80			14002/5	4	0.3	9	22	<0.3	1.6	36	21	77	1.3
TP 3	3.20			14002/6	37	0.6	7	50	<0.3	2.4	43	19	79	0.8
TP 4	0.90			14002/7	16	0.7	13	25	<0.3	1.8	32	28	90	0.7
TP 5	1.70			14002/8	9	1.3	14	30	<0.3	1.2	20	21	110	1.4
TP 6	1.50			14002/9	74	1.1	9	27	<0.3	0.7	10	2	30	1.2
TP 7	1.40			14002/10	4	0.2	5	17	<0.3	1.0	10	8	42	0.6
TP 11	2.20			14002/11	16	0.3	8	23	<0.3	1.5	40	16	74	1.1
TP 12	0.50			14002/12	11	<0.2	11	13	<0.3	1.1	46	11	27	1.2
TP 12	2.50			14002/13	11	1.0	13	24	<0.3	1.5	22	26	92	0.7
TP 18	0.80			14002/14	6	0.7	26	25	<0.3	2.5	18	8	54	1.1
TP 18	2.50			14002/15	7	0.8	26	26	<0.3	2.3	18	9	51	1.6
TP 19	0.60			14002/16	24	0.9	10	25	<0.3	1.4	45	19	370	1.1
TP 19	3.20			14002/17	17	0.5	10	12	<0.3	3.0	20	10	32	0.9
TP 20	1.00			14002/18	26	1.3	12	24	<0.3	1.9	110	34	360	0.9
TP 20	2.20			14002/19	51	2.4	20	23	<0.3	0.7	150	51	130	1.2
TP 21	1.00			14002/20	6	0.8	91	34	<0.3	3.2	200	20	63	1.4
TP 21	2.70			14002/21	11	0.9	8	8	<0.3	1.2	22	22	83	1.1

Client Reference: 04014

Laboratory Reference: 14002

NORTH GAWBER SURFACE MINING SCHEME

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide	Sulphide	Sulphate content		pH	Total Phenols	Toluene Extractable Matter (mg/kg)	Total PAH
					(mg/kg CN)	(mg/kg S ²⁻)	(% SO ₃)	(% SO ₄)	Value	(mg/kg)	(mg/kg)	
					DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 050
TP 1	0.40			14002/1	<1	16	0.05	0.06	7.1	0.4	<40	<5
TP 1	2.90			14002/2	<1	<10	0.04	0.05	6.8	<0.2	<40	<5
TP 2	1.90			14002/3	<1	49	0.31	0.37	7.2	<0.2	86	<5
TP 2	2.80			14002/4	<1	<10	0.04	0.05	7.0	0.3	<40	<5
TP 3	1.80			14002/5	<1	24	0.17	0.20	7.1	<0.2	81	<5
TP 3	3.20			14002/6	<1	20	0.43	0.52	7.4	<0.2	79	<5
TP 4	0.90			14002/7	<1	16	0.21	0.25	5.9	1.1	52	<5
TP 5	1.70			14002/8	<1	<10	0.04	0.05	5.9	1.2	<40	<5
TP 6	1.50			14002/9	<1	<10	5.01	6.01	3.9	<0.2	<40	<5
TP 7	1.40			14002/10	<1	<10	0.15	0.18	4.2	<0.2	<40	<5
TP 11	2.20			14002/11	<1	16	0.60	0.72	3.9	0.3	580	38
TP 12	0.50			14002/12	<1	<10	0.18	0.22	6.8	<0.2	<40	<5
TP 12	2.50			14002/13	<1	<10	0.07	0.08	7.1	<0.2	60	<5
TP 18	0.80			14002/14	<1	550	0.17	0.20	9.3	<0.2	11000	<5
TP 18	2.50			14002/15	<1	510	0.12	0.14	9.1	<0.2	3300	120
TP 19	0.60			14002/16	<1	81	0.35	0.42	10.5	<0.2	1000	<5
TP 19	3.20			14002/17	<1	<10	0.03	0.04	9.2	<0.2	<40	32
TP 20	1.00			14002/18	<1	41	0.35	0.42	8.9	<0.2	4800	37
TP 20	2.20			14002/19	<1	41	0.72	0.86	8.4	0.8	3100 (Coal)	170
TP 21	1.00			14002/20	<1	550	0.17	0.20	10.0	0.6	8600	30
TP 21	2.70			14002/21	<1	29	0.14	0.17	8.0	<0.2	69	<5

Client Reference: 04014

Laboratory Reference: 14002

NORTH GAWBER SURFACE MINING SCHEME

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Total	Total	Total	Total	Total	Total	Total	Total	Water Soluble
					Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (B)
					(mg/kg As)	(mg/kg Cd)	(mg/kg Cr)	(mg/kg Pb)	(mg/kg Hg)	(mg/kg Se)	(mg/kg Cu)	(mg/kg Ni)	(mg/kg Zn)	(mg/kg)
					DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
TP 24	2.70			14002/22	57	0.7	4	13	<0.3	1.4	21	11	45	0.4
TP 26	3.10			14002/23	66	0.6	<1	11	<0.3	2.0	17	5	23	0.7
TP 27	1.60			14002/24	15	1.0	11	13	<0.3	1.1	32	31	170	0.8
TP 27	1.80			14002/25	6	0.8	8	6	<0.3	1.0	21	23	140	0.7
TP 29	1.00			14002/26	11	1.6	9	51	0.4	1.1	47	26	61	0.5
TP 29	2.30			14002/27	13	0.3	18	9	<0.3	1.9	32	35	83	1.7

Client Reference: 04014

Laboratory Reference: 14002

NORTH GAWBER SURFACE MINING SCHEME

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide	Sulphide	Sulphate content		pH Value	Total Phenols	Toluene Extractable Matter (mg/kg)	Total PAH
					(mg/kg CN)	(mg/kg S ²⁻)	(% SO ₃)	(% SO ₄)	(mg/kg)	(mg/kg)	(mg/kg)	
					DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 050
TP 24	2.70			14002/22	<1	45	1.51	1.81	6.0	0.4	68	<5
TP 26	3.10			14002/23	<1	37	1.33	1.60	3.3	<0.2	62	5
TP 27	1.60			14002/24	<1	<10	0.09	0.11	6.0	<0.2	82	<5
TP 27	1.80			14002/25	<1	<10	0.03	0.04	5.5	0.3	54	23
TP 29	1.00			14002/26	<1	20	0.02	0.02	7.0	<0.2	91	30
TP 29	2.30			14002/27	<1	<10	0.93	1.12	5.0	0.2	<40	46

Client Reference: 04014

Laboratory Reference: 14002

NORTH GAWBER SURFACE MINING SCHEME

Summary of Chemical Analyses on Soil Samples

	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020
<i>Date Analysed</i>	14/09/2004	14/09/2004	14/09/2004	14/09/2004	14/09/2004	14/09/2004	14/09/2004	14/09/2004	14/09/2004	16/09/2004

	Total Cyanide (mg/kg CN) DETS 021	Sulphide (mg/kg S ²⁻) DETS 024	Sulphate content (% SO ₃) DETS 004 (% SO ₄) DETS 004		pH Value DETS 008	Total Phenols (mg/kg) DETS 023	Toluene Extractable Matter (mg/kg) DETS 029	Total PAH (mg/kg) DETS 050
<i>Date Analysed</i>	14/09/2004	10/09/2004	14/09/2004		13/09/2004	14/09/2004	10-13/09/2004	14/09/2004

Client Reference: 04014

Laboratory Reference: 14002



CERTIFICATE OF ANALYSIS

Certificate Number : 13991

Client Reference : 04014

16 September 2004

Our Reference : 13991

Clients Name : Scott Doherty Associates
Clients Address: Derwentside Business Centre
Consett Business Park
Consett
Co Durham
DH8 6BP

Contract Title : North Gawber

Description : Eighteen soil samples

Date Received : 03 September 2004

Test Procedures : Identified by Prefix DETSn , Details available upon request.

Notes :

* Denotes test not included in laboratory scope of accreditation

Observations and Interpretations are Outside the UKAS Accreditation Scope

Approved By:

Authorised Signatories R Bennett
Director

R Brown
Laboratory/Technical Manager

S Wilson
Quality Manager

Page 1 of 4 Pages

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NORTH GAWBER

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Total	Total	Total	Total	Total	Total	Total	Total	Water Soluble	
					Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (B)	
					(mg/kg As)	(mg/kg Cd)	(mg/kg Cr)	(mg/kg Pb)	(mg/kg Hg)	(mg/kg Se)	(mg/kg Cu)	(mg/kg Ni)	(mg/kg Zn)	(mg/kg)	
					DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
TP 04	2.40			13991/1	14	0.7	10	10	<0.3	0.9	19	18	71	1.3	
TP 06	0.80			13991/2	38	0.6	3	5	<0.3	0.8	16	5	28	1.1	
TP 08	1.00			13991/3	18	0.6	9	13	<0.3	0.7	14	19	56	1.3	
TP 08	2.00			13991/4	6	2.0	7	11	<0.3	<0.3	19	35	140	1.4	
TP 09	1.30			13991/5	8	0.5	14	7	<0.3	0.7	25	20	73	1.1	
TP 09	3.00			13991/6	8	0.4	13	8	<0.3	<0.3	23	22	90	0.8	
TP 10	0.60			13991/7	14	0.5	7	13	<0.3	0.6	30	26	79	1.2	
TP 10	2.50			13991/8	14	0.4	8	13	<0.3	0.6	30	26	80	1.1	
TP 13	2.80			13991/9	32	0.4	3	10	<0.3	0.3	27	9	44	0.9	
TP 14	2.00			13991/10	55	0.5	4	19	<0.3	0.6	29	6	57	1.5	
TP 14	3.00			13991/11	30	1.1	74	52	<0.3	0.7	74	24	91	1.4	
TP 17	2.10			13991/12	20	1.4	29	33	<0.3	<0.3	80	52	240	1.4	
TP 22	0.80			13991/13	3	0.4	4	6	<0.3	<0.3	10	23	82	1.2	
TP 22	1.45			13991/14	7	<0.2	4	7	<0.3	0.4	23	4	49	2.1	
TP 25	1.00			13991/15	12	0.6	6	35	<0.3	0.4	40	21	100	1.2	
TP 28	1.80			13991/16	10	<0.2	<1	<1	<0.3	0.7	21	2	18	0.9	
TP 28	2.50			13991/17	120	0.8	13	41	<0.3	<0.3	14	15	90	1.2	
TP 28	2.50 ²⁶⁰			13991/18	22	0.4	2	3	<0.3	1.0	58	34	46	1.1	

Client Reference: 04014

Laboratory Reference: 13991

NORTH GAWBER

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide	Sulphide	Sulphate content		pH	Total Phenols	Toluene Extractable Matter (mg/kg)	Total PAH
					(mg/kg CN)	(mg/kg S ²⁻)	(% SO ₃)	(% SO ₄)	Value	(mg/kg)	(mg/kg)	(mg/kg)
					DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 050
TP 04	2.40			13991/1	<1	37	0.14	0.17	6.2	<0.2	120	<5
TP 06	0.80			13991/2	<1	24	1.58	1.90	3.6	1.3	<40	<5
TP 08	1.00			13991/3	<1	<10	1.49	1.79	4.4	<0.2	<40	<5
TP 08	2.00			13991/4	<1	24	0.52	0.62	4.8	<0.2	<40	<5
TP 09	1.30			13991/5	<1	<10	0.05	0.06	5.0	<0.2	<40	<5
TP 09	3.00			13991/6	<1	<10	0.04	0.05	5.7	<0.2	<40	<5
TP 10	0.60			13991/7	<1	12	0.08	0.10	7.0	<0.2	<40	<5
TP 10	2.50			13991/8	<1	<10	0.06	0.07	7.9	<0.2	<40	<5
TP 13	2.80			13991/9	<1	<10	1.70	2.04	3.5	<0.2	71	<5
TP 14	2.00			13991/10	<1	20	1.29	1.55	4.0	<0.2	<40	<5
TP 14	3.00			13991/11	<1	24	0.17	0.20	7.8	<0.2	2300	54
TP 17	2.10			13991/12	<1	24	0.25	0.30	8.3	<0.2	390	18
TP 22	0.80			13991/13	<1	<10	0.08	0.10	5.3	0.2	45	<5
TP 22	1.45			13991/14	<1	<10	0.55	0.66	6.0	<0.2	<40	<5
TP 25	1.00			13991/15	<1	28	0.24	0.29	8.0	<0.2	160	<5
TP 28	1.80			13991/16	<1	89	1.16	1.39	5.2	0.3	<40	<5
TP 28	2.50			13991/17	<1	57	0.05	0.06	4.4	<0.2	<40	<5
TP 28	2.50	2.60?		13991/18	<1	16	0.98	1.18	4.2	1.1	<40	<5

Client Reference: 04014

Laboratory Reference: 13991

NORTH GAWBER

Summary of Chemical Analyses on Soil Samples

	Total Arsenic (mg/kg As)	Total Cadmium (mg/kg Cd)	Total Chromium (mg/kg Cr)	Total Lead (mg/kg Pb)	Total Mercury (mg/kg Hg)	Total Selenium (mg/kg Se)	Total Copper (mg/kg Cu)	Total Nickel (mg/kg Ni)	Total Zinc (mg/kg Zn)	Water Soluble Boron (B) (mg/kg)
	DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
<i>Date Analysed</i>	10/09/2004	10/09/2004	10/09/2004	10/09/2004	10/09/2004	10/09/2004	10/09/2004	10/09/2004	10/09/2004	16/09/2004

	Total Cyanide (mg/kg CN)	Sulphide (mg/kg S ²⁻)	Sulphate content (% SO ₃) (% SO ₄)		pH Value	Total Phenols (mg/kg)	Toluene Extractable Matter (mg/kg)	Total PAH (mg/kg)
	DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 050
<i>Date Analysed</i>	14/09/2004	15/09/2004	15/09/2004		15/09/2004	14-15/09/2004	08/09/2004	09/09/2004

Client Reference: 04014

Laboratory Reference: 13991



CERTIFICATE OF ANALYSIS

Certificate Number : 14122

Client Reference : 04014

29 September 2004

Our Reference : 14122

Clients Name : Scott Doherty Associates
Clients Address : Derwentside Business Centre
Consett Business Park
Consett
Co Durham
DH8 6BP



Contract Title : North Gawber Site

Description : Five soil samples

Date Received : 16 September 2004

Test Procedures : Identified by Prefix DETSn , Details available upon request.

Notes :

* Denotes test not included in laboratory scope of accreditation

Observations and Interpretations are Outside the UKAS Accreditation Scope

Approved By:

Authorised Signatories R Bennett
Director

R Brown
Laboratory/Technical Manager

S Wilson
Quality Manager

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NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Total	Total	Total	Total	Total	Total	Total	Total	Water Soluble
					Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (B)
					(mg/kg As)	(mg/kg Cd)	(mg/kg Cr)	(mg/kg Pb)	(mg/kg Hg)	(mg/kg Se)	(mg/kg Cu)	(mg/kg Ni)	(mg/kg Zn)	(mg/kg)
					DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
TP 15	0.50			14122/1	24	0.4	4	40	<0.3	0.6	45	16	83	1.6
TP 15	2.00			14122/2	31	0.5	7	37	<0.3	0.4	63	15	29	1.6
TP 16	1.50			14122/3	11	0.5	13	14	<0.3	<0.3	31	24	68	1.7
TP 16	2.70			14122/4	8	0.7	15	17	<0.3	0.5	25	18	81	1.8
BH 17	4.50		D	14122/5	8	0.4	15	15	<0.3	<0.3	33	26	78	1.6

Client Reference: 04014

Laboratory Reference: 14122

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide	Sulphide	Sulphate content		pH Value	Total Phenols	Toluene Extractable Matter (mg/kg)	Total PAH
					(mg/kg CN)	(mg/kg S ²⁻)	(% SO ₃)	(% SO ₄)		(mg/kg)	(mg/kg)	
					DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 050
TP 15	0.50			14122/1	<1	12	0.12	0.14	7.0	1.2	53	17
TP 15	2.00			14122/2	<1	<10	0.69	0.83	7.0	1.4	<40	<5
TP 16	1.50			14122/3	<1	<10	0.29	0.35	4.6	<0.2	<40	<5
TP 16	2.70			14122/4	<1	<10	0.14	0.17	4.2	<0.2	<40	<5
BH 17	4.50		D	14122/5	<1	<10	0.12	0.14	5.5	<0.2	67	<5

Client Reference: 04014

Laboratory Reference: 14122

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

	Total Arsenic (mg/kg As)	Total Cadmium (mg/kg Cd)	Total Chromium (mg/kg Cr)	Total Lead (mg/kg Pb)	Total Mercury (mg/kg Hg)	Total Selenium (mg/kg Se)	Total Copper (mg/kg Cu)	Total Nickel (mg/kg Ni)	Total Zinc (mg/kg Zn)	Water Soluble Boron (B) (mg/kg)
	DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
<i>Date Analysed</i>	22/09/2004	22/09/2004	22/09/2004	22/09/2004	23/09/2004	22/09/2004	22/09/2004	22/09/2004	22/09/2004	27/09/2004

	Total Cyanide (mg/kg CN)	Sulphide (mg/kg S ²⁻)	Sulphate content (% SO ₃) (% SO ₄)		pH Value	Total Phenols (mg/kg)	Toluene Extractable Matter (mg/kg)	Total PAH (mg/kg)
	DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 050
<i>Date Analysed</i>	27/09/2004	24/09/2004	24/09/2004		24/09/2004	24/09/2004	28/09/2004	23/09/2004

Client Reference: 04014

Laboratory Reference: 14122



CERTIFICATE OF ANALYSIS

Certificate Number : 14054-1

Client Reference : 04014

Our Reference : 14054-1

Clients Name : Scott Doherty Associates
Clients Address : Derwentside Business Centre
Consett Business Park
Consett
Co Durham
DH8 6BP

14 October 2004



Contract Title : North Gawber Site

Description : Forty nine soil samples and eight leachate samples prepared from soils

Date Received : 09 September 2004

Test Procedures : Identified by Prefix DETSn , Details available upon request.

Notes : This report supersedes 14054

* Denotes test not included in laboratory scope of accreditation

Observations and Interpretations are Outside the UKAS Accreditation Scope

Approved By:

Authorised Signatories R Bennett
Director

R Brown
Laboratory/Technical Manager

S Wilson
Quality Manager

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NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020
BH 01	2.00		D	14054/1	42	0.8	9	48	<0.3	1.0	35	22	72	2.4
BH 01	4.00		D	14054/2	58	0.7	9	40	<0.3	1.2	38	25	61	2.4
BH 02	2.00		D	14054/3	32	0.8	8	34	<0.3	1.1	31	19	53	2.3
BH 02	6.00		D	14054/4	30	0.6	9	43	<0.3	1.5	32	25	79	1.9
BH 02	8.50		D	14054/5	18	0.9	14	16	<0.3	<0.3	24	23	69	2.0
BH 03	2.00		D	14054/6	39	0.7	10	26	<0.3	0.6	30	21	62	1.4
BH 03	4.00		D	14054/7	16	1.0	9	25	<0.3	0.3	30	18	61	1.6
BH 04A	2.00		D	14054/8	19	0.5	8	23	<0.3	1.0	30	25	60	1.2
BH 04C	2.00		D	14054/9	15	0.6	9	27	<0.3	1.1	34	25	71	1.1
BH 05	2.00		D	14054/10	28	0.5	6	23	<0.3	1.0	29	21	48	1.2
BH 05	4.50 <i>4.00</i>		D	14054/11	45	0.8	6	25	<0.3	1.0	28	20	50	1.4
BH 05	4.00 <i>4.50</i>		D	14054/12	8	0.8	13	22	<0.3	0.7	26	28	78	1.3
BH 06	2.00		D	14054/13	110	0.8	9	27	<0.3	1.6	30	30	65	1.9
BH 06	3.00		D	14054/14	3	0.5	14	17	<0.3	0.6	21	20	68	2.0
BH 07	2.00		D	14054/15	12	0.3	7	12	<0.3	0.8	28	22	57	1.5
BH 07	4.00		D	14054/16	6	0.6	13	15	<0.3	<0.3	22	14	63	1.6
BH 08	2.00		D	14054/17	18	0.5	8	19	<0.3	<0.3	36	17	66	1.3
BH 08	3.90		D	14054/18	9	0.9	12	18	<0.3	0.5	13	9	59	1.2
BH 08	4.00		D	14054/19	9	1.3	12	18	<0.3	<0.3	17	19	67	1.6
BH 09	2.00		D	14054/20	10	<0.2	<1	5	<0.3	<0.3	15	5	16	1.5

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide	Sulphide	Sulphate content		pH	Total Phenols	Toluene Extractable Matter (mg/kg)	Gasoline Range Organics *	Diesel Range Organics	Mineral Range Organics	Total Petroleum Hydrocarbons
					(mg/kg CN)	(mg/kg S ²⁻)	(% SO ₃)	(% SO ₄)	Value	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
					DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 062	DETS 052	DETS 052	DETS 052
BH 01	2.00		D	14054/1	<1	56	0.92	1.10	7.8	1.8	100				
BH 01	4.00		D	14054/2	<1	32	0.60	0.72	7.5	1.5	53				
BH 02	2.00		D	14054/3	<1	44	0.89	1.07	7.0	1.2	120				
BH 02	6.00		D	14054/4	<1	48	0.60	0.72	6.9	0.6	61				
BH 02	8.50		D	14054/5	<1	<10	0.16	0.19	7.2	0.5	72				
BH 03	2.00		D	14054/6	<1	24	1.36	1.63	4.7	0.8	52				
BH 03	4.00		D	14054/7	<1	12	0.86	1.03	4.6	<0.2	<40				
BH 04A	2.00		D	14054/8	<1	24	0.04	0.05	6.4	<0.2	<40				
BH 04C	2.00		D	14054/9	<1	12	0.08	0.10	7.9	0.4	110				
BH 05	2.00		D	14054/10	<1	28	0.66	0.79	6.5	<0.2	100				
BH 05	4.50	4.00	D	14054/11	<1	44	0.64	0.77	6.4	3.4	64				
BH 05	4.00	4.50	D	14054/12	<1	16	0.19	0.23	6.9	<0.2	85				
BH 06	2.00		D	14054/13	<1	76	0.93	1.12	6.4	<0.2	120				
BH 06	3.00		D	14054/14	<1	12	0.06	0.07	6.0	<0.2	77				
BH 07	2.00		D	14054/15	<1	12	0.35	0.42	5.4	<0.2	140				
BH 07	4.00		D	14054/16	<1	28	0.05	0.06	6.3	<0.2	50				
BH 08	2.00		D	14054/17	<1	<10	0.73	0.88	4.7	0.7	58				
BH 08	3.90		D	14054/18	<1	20	0.03	0.04	6.4	1.6	<40				
BH 08	4.00		D	14054/19	<1	<10	0.02	0.02	6.9	0.3	100				
BH 09	2.00		D	14054/20	<1	180	0.94	1.13	5.9	0.9	82				

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Total	Total	Total	Total	Total	Total	Total	Total	Water Soluble	
					Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (B)	
					(mg/kg As)	(mg/kg Cd)	(mg/kg Cr)	(mg/kg Pb)	(mg/kg Hg)	(mg/kg Se)	(mg/kg Cu)	(mg/kg Ni)	(mg/kg Zn)	(mg/kg)	
					DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
BH 09	4.00		D	14054/21	6	0.6	11	9	<0.3	<0.3	18	26	63	1.7	
BH 10	2.00		D	14054/22	7	0.3	8	10	<0.3	<0.3	26	8	37	1.6	
BH 10	4.00		D	14054/23	26	0.5	6	15	<0.3	1.0	49	26	76	1.3	
BH 10	6.00		D	14054/24	23	0.6	6	17	<0.3	0.6	51	24	32	1.4	
BH 10	8.60		D	14054/25	6	0.5	12	12	<0.3	<0.3	21	15	53	1.3	
BH 11	2.00		D	14054/26	10	0.8	15	12	<0.3	<0.3	30	31	82	1.2	
BH 11	4.00		D	14054/27	7	0.8	15	12	<0.3	<0.3	28	29	76	1.1	
BH 12	2.00		D	14054/28	16	0.4	9	16	<0.3	<0.3	35	16	71	0.9	
BH 12	6.00		D	14054/29	12	0.7	10	18	<0.3	<0.3	29	23	68	0.9	
BH 12	10.00		D	14054/30	11	0.7	14	14	<0.3	<0.3	29	29	69	1.2	
BH 13	2.00		D	14054/31	31	0.6	7	9	<0.3	1.6	75	20	28	2.1	
BH 13	3.60		D	14054/32	7	0.3	9	13	<0.3	0.4	13	14	46	2.1	
BH 14	2.00		D	14054/33	58	0.9	12	11	<0.3	0.7	85	22	32	1.8	
BH 14	3.40		D	14054/34	38	0.8	6	13	<0.3	1.0	78	38	50	1.4	
BH 15D	2.00		D	14054/35	10	0.3	6	39	<0.3	1.0	32	22	53	1.2	
BH 16	2.00		D	14054/36	27	0.4	5	17	<0.3	1.0	31	13	20	1.6	
BH 16	5.50		D	14054/37	19	0.7	7	22	<0.3	0.4	43	21	59	1.9	
BH 16	4.00		D	14054/38	5	0.3	8	7	<0.3	<0.3	12	16	48	1.7	
BH 17	1.60		D	14054/39	11	0.4	11	10	<0.3	2.0	24	16	34	1.6	
BH 17	4.50		D	14054/40	7	0.8	10	35	<0.3	1.9	26	68	54	1.5	

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide	Sulphide	Sulphate content		pH	Total Phenols	Toluene Extractable Matter (mg/kg)	Gasoline Range Organics *	Diesel Range Organics	Mineral Range Organics	Total Petroleum Hydrocarbons
					(mg/kg CN)	(mg/kg S ²⁻)	(% SO ₃)	(% SO ₄)	Value	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
					DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 062	DETS 052	DETS 052	DETS 052
BH 09	4.00		D	14054/21	<1	<10	0.23	0.28	6.5	<0.2	<40				
BH 10	2.00		D	14054/22	<1	32	0.41	0.49	4.0	0.7	<40				
BH 10	4.00		D	14054/23	<1	40	1.94	2.33	5.5	4.6	58				
BH 10	6.00		D	14054/24	<1	60	1.32	1.58	5.2	3.1	49				
BH 10	8.60		D	14054/25	<1	28	0.04	0.05	5.7	<0.2	<40				
BH 11	2.00		D	14054/26	<1	<10	0.11	0.13	7.8	<0.2	<40				
BH 11	4.00		D	14054/27	<1	<10	0.08	0.10	6.0	<0.2	54				
BH 12	2.00		D	14054/28	<1	36	0.61	0.73	4.8	2.5	<40				
BH 12	6.00		D	14054/29	<1	36	0.31	0.37	6.4	1.6	100				
BH 12	10.00		D	14054/30	<1	16	0.10	0.12	7.1	0.5	<40				
BH 13	2.00		D	14054/31	<1	28	2.95	3.54	4.6	<0.2	<40				
BH 13	3.60		D	14054/32	<1	28	0.03	0.04	6.6	<0.2	71				
BH 14	2.00		D	14054/33	<1	44	2.39	2.87	3.9	<0.2	<40				
BH 14	3.40		D	14054/34	<1	20	2.78	3.34	4.2	1.6	40				
BH 15D	2.00		D	14054/35	<1	28	0.06	0.07	7.8	0.3	49				
BH 16	2.00		D	14054/36	<1	12	1.19	1.43	5.6	3.3	<40				
BH 16	5.50		D	14054/37	<1	36	0.34	0.41	6.3	2.3	130				
BH 16	4.00		D	14054/38	<1	<10	0.04	0.05	5.0	<0.2	46				
BH 17	1.60		D	14054/39	<1	12	0.43	0.52	5.8	<0.2	65				
BH 17	4.50		D	14054/40	<1	<10	0.55	0.66	5.1	1.4	<40				

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Total	Total	Total	Total	Total	Total	Total	Total	Water Soluble
					Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron (B)
					(mg/kg As)	(mg/kg Cd)	(mg/kg Cr)	(mg/kg Pb)	(mg/kg Hg)	(mg/kg Se)	(mg/kg Cu)	(mg/kg Ni)	(mg/kg Zn)	(mg/kg)
					DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 042	DETS 042	DETS 042	DETS 042	DETS 020
BH 18	2.00		D	14054/41	6	0.9	76	24	<0.3	2.3	21	7	57	1.3
BH 18	4.00		D	14054/42	4	0.8	52	22	<0.3	1.6	17	9	55	1.0
BH 18	7.40		D	14054/43	9	0.3	9	10	<0.3	0.9	20	5	40	0.8
BH 18	7.80		D	14054/44	8	0.3	8	5	<0.3	0.6	16	9	37	0.8
BH 19	2.00		D	14054/45	8	0.6	8	23	<0.3	0.9	25	8	61	0.9
BH 19	5.40		D	14054/46	6	1.5	11	15	<0.3	1.0	18	16	81	2.1
BH 20	2.00		D	14054/47	14	0.5	12	14	<0.3	0.8	43	9	56	1.9
BH 20	4.00		D	14054/48	11	0.5	12	12	<0.3	0.7	39	11	58	1.6
BH 20	6.30		D	14054/49	7	0.6	12	10	<0.3	0.7	24	13	57	1.4

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Sulphide	Sulphate content		pH	Total	Toluene	Gasoline Range	Diesel Range	Mineral Range	Total Petroleum
					Cyanide	(mg/kg S ²⁻)	(% SO ₃)	(% SO ₄)	Value	Phenols	Extractable	Organics *	Organics	Organics	Hydrocarbons
					(mg/kg CN)	DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 023	DETS 029	DETS 062	DETS 052	DETS 052
BH 18	2.00		D	14054/41	<1	350	0.21	0.25	10.5	1.3	6000	<20	3000	10000	13000
BH 18	4.00		D	14054/42	<1	60	0.12	0.14	11.0	0.2	12000	<20	2000	9700	11700
BH 18	7.40		D	14054/43	<1	20	0.03	0.04	5.9	<0.2	<40				
BH 18	7.80		D	14054/44	<1	<10	0.02	0.02	6.1	<0.2	<40				
BH 19	2.00		D	14054/45	<1	110	0.10	0.12	9.7	1.3	360				
BH 19	5.40		D	14054/46	<1	<10	0.02	0.02	7.3	0.6	100				
BH 20	2.00		D	14054/47	<1	20	0.49	0.59	4.4	0.6	69				
BH 20	4.00		D	14054/48	<1	20	0.38	0.46	4.4	0.5	<40				
BH 20	6.30		D	14054/49	<1	<10	0.02	0.02	6.4	<0.2	<40				

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Speciated Polyaromatic Hydrocarbon Analysis on Soils Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Naphthalene (l)	Acenaphthene (l)	Acenaphthylene (l)	Fluorene (l)	Phenanthrene (l)	Anthracene (l)	Fluoranthene (l)	Pyrene (l)	Benz (a) anthracene (l)
Milligrams per Kilogram (mg/kg)													
BH 18	2.00		D	14054/41	<0.1	<0.1	<0.1	<0.1	<0.1	7.6	12	10	<0.1

Client Reference: 04014

Laboratory Reference: 14054-1

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

NORTH GAWBER SITE

Speciated Polyaromatic Hydrocarbon Analysis on Soils Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Chrysene (l)	Benz (b) fluoranthene (l)	Benz (k) fluoranthene (l)	Benz (a) pyrene (l)	Dibenz (ah) anthracene (l)	Indeno (123cd) pyrene (l)	Benzo (ghi) perylene (l)	Total PAH (l)
BH 18	2.00		D	14054/41	5.0	<0.1	2.3	2.0	<0.1	1.7	<0.1	42

Milligrams per Kilogram (mg/kg)

Client Reference: 04014

Laboratory Reference: 14054-1

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

	Total Arsenic (mg/kg As) DETS 042	Total Cadmium (mg/kg Cd) DETS 042	Total Chromium (mg/kg Cr) DETS 042	Total Lead (mg/kg Pb) DETS 042	Total Mercury (mg/kg Hg) DETS 015	Total Selenium (mg/kg Se) DETS 042	Total Copper (mg/kg Cu) DETS 042	Total Nickel (mg/kg Ni) DETS 042	Total Zinc (mg/kg Zn) DETS 042	Water Soluble Boron (B) (mg/kg) DETS 020
<i>Date Analysed</i>	21-22/09/2004	21-22/09/2004	21-22/09/2004	21-22/09/2004	21-22/09/2004	21-22/09/2004	21-22/09/2004	21-22/09/2004	21-22/09/2004	27/09/2004

	Total Cyanide (mg/kg CN) DETS 021	Sulphide (mg/kg S ²⁻) DETS 024	Sulphate content (% SO ₃) (% SO ₄) DETS 004		pH Value DETS 008	Total Phenols (mg/kg) DETS 023	Toluene Extractable Matter (mg/kg) DETS 029	Total/Speciated PAH (mg/kg) DETS 050	Gasoline Range Organics * (mg/kg) DETS 062	Diesel Range Organics (mg/kg) DETS 052
<i>Date Analysed</i>	24/09/2004	20/09/2004	21/09/2004		21/09/2004	23/09/2004	21-22/09/2004	20-21/09/2004	13/10/2004	14/10/2004

	Mineral Range Organics (mg/kg) DETS 052	Total Petroleum Hydrocarbons (mg/kg) DETS 052
<i>Date Analysed</i>	14/10/2004	14/10/2004

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Summary of Chemical Analyses on Leachate Samples Prepared from Soils

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Arsenic (µg/l As) DETS 042	Nickel (µg/l Ni) DETS 042
BH 01	4.00		D	14054/2	<1	
BH 04A	2.00		D	14054/8	<1	
BH 06	2.00		D	14054/13	<1	
BH 11	2.00		D	14054/26		<10
BH 12	2.00		D	14054/28	<1	
BH 14	2.00		D	14054/33	<1	
BH 14	3.40		D	14054/34		170
BH 17	4.50		D	14054/40		10

Client Reference: 04014

Laboratory Reference: 14054-1

NORTH GAWBER SITE

Summary of Chemical Analyses on Leachates Prepared from Soil Samples

	Arsenic	Nickel
	($\mu\text{g/l As}$)	($\mu\text{g/l Ni}$)
	DETS 042	DETS 042
<i>Date Analysed</i>	11/10/2004	11/10/2004

Client Reference: 04014

Laboratory Reference: 14054-1

dets

Derwentside Environmental Testing Services



CERTIFICATE OF ANALYSIS

Certificate Number : 14284

Client Reference : 04014

18 October 2004

Our Reference : 14284

Clients Name : Scott Doherty Associates
Clients Address: Derwentside Business Centre
Consett Business Park
Consett
Co Durham
DH8 6BP

Contract Title : North Gawber Site

Description : Four soil samples and five leachate samples prepared from soils

Date Received : 28 September 2004

Test Procedures : Identified by Prefix DETSn , Details available upon request.

Notes :

* Denotes test not included in laboratory scope of accreditation

Observations and Interpretations are Outside the UKAS Accreditation Scope

Approved By:

Authorised Signatories R Bennett
Director

R Brown
Laboratory/Technical Manager

S Wilson
Quality Manager

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Registered in England No. 370 5645 • VAT No. 700 978 678

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total	Gasoline Range	Diesel Range	Mineral Range	Total Petroleum
					PAH	Organics *	Organics	Organics	Hydrocarbons
					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
					DETS 050	DETS 062	DETS 062	DETS 062	DETS 062
TP 20	2.20		D	14284/4	57				
TP 21	1.00		D	14284/5		<20	230	1570	1800
TP 18	0.80		D	14284/6		<20	<20	7800	7800
TP 18	2.50		D	14284/7	90				

Client Reference: 04014

Laboratory Reference: 14284

NORTH GAWBER SITE

Speciated Polyaromatic Hydrocarbon Analysis on Soils Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Naphthalene (l)	Acenaphthene (l)	Acenaphthylene (l)	Fluorene (l)	Phenanthrene (l)	Anthracene (l)	Fluoranthene (l)	Pyrene (l)	Benz (a) anthracene (l)
Milligrams per Kilogram (mg/kg)													
TP 20	2.20		D	14284/4	5.60	3.94	2.65	4.14	3.60	2.08	15.10	5.21	<0.1
TP 18	2.50		D	14284/7	2.36	1.09	1.10	1.51	6.45	2.13	2.49	13.28	9.28

Client Reference: 04014

Laboratory Reference: 14284

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

NORTH GAWBER SITE

Speciated Polyaromatic Hydrocarbon Analysis on Soils Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Chrysene (l)	Benz (b) fluoranthene (l)	Benz (k) fluoranthene (l)	Benz (a) pyrene (l)	Dibenz (ah) anthracene (l)	Indeno (123cd) pyrene (l)	Benzo (ghi) perylene (l)	Total PAH (l)
Milligrams per Kilogram (mg/kg)												
TP 20	2.20		D	14284/4	2.23	2.80	<0.1	2.78	<0.1	<0.1	6.41	57
TP 18	2.50		D	14284/7	8.62	13.55	<0.1	8.96	6.44	3.82	8.88	90

Client Reference: 04014

Laboratory Reference: 14284

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

NORTH GAWBER SITE

Summary of Chemical Analyses on Soil Samples

	Speciated PAH (mg/kg) DETS 050	Gasoline Range Organics * (mg/kg) DETS 062	Diesel Range Organics (mg/kg) DETS 062	Mineral Range Organics (mg/kg) DETS 062	Total Petroleum Hydrocarbons (mg/kg) DETS 062
<i>Date Analysed</i>	07/10/2004	13/10/2004	18/10/2004	18/10/2004	18/10/2004

Client Reference: 04014

Laboratory Reference: 14284

NORTH GAWBER SITE

Summary of Chemical Analyses on Leachate Samples Prepared from Soils

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Arsenic (µg/l As) DETS 042	Copper (µg/l Cu) DETS 042	Nickel (µg/l Ni) DETS 042
TP 06	1.50		D	14284/1	<1		
TP 17	2.10		D	14284/2			<10
TP 28	2.50		D	14284/3	<1		
TP 20	2.20		D	14284/4			<10
TP 21	1.00		D	14284/5		150	

Client Reference: 04014

Laboratory Reference: 14284

NORTH GAWBER SITE

Summary of Chemical Analyses on Leachates Prepared from Soil Samples

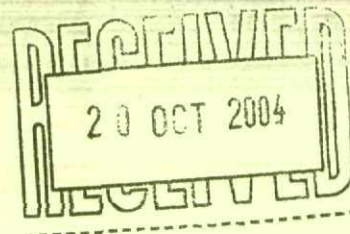
	Arsenic	Copper	Nickel
	($\mu\text{g/l As}$)	($\mu\text{g/l Cu}$)	($\mu\text{g/l Ni}$)
	DETS 042	DETS 042	DETS 042
<i>Date Analysed</i>	14/10/2004	14/10/2004	14/10/2004

Client Reference: 04014

Laboratory Reference: 14284

dets

Derwentside Environmental Testing Services



CERTIFICATE OF ANALYSIS

Certificate Number : 14334

Client Reference : 04014

18 October 2004

Our Reference : 14334

Clients Name : Scott Doherty Associates
Clients Address: Derwentside Business Centre
Consett Business Park
Consett
Co Durham
DH8 6BP

Contract Title : North Gawber Site

Description : Four water samples

Date Received : 1 October 2004

Test Procedures : Identified by Prefix DETSn , Details available upon request.

Notes :

* Denotes test not included in laboratory scope of accreditation

Observations and Interpretations are Outside the UKAS Accreditation Scope

Approved By:

Authorised Signatories R Bennett
Director

R Brown
Laboratory/Technical Manager

S Wilson
Quality Manager

Page 1 of 4 Pages

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NORTH GAWBER SITE

Summary of Chemical Analyses on Water Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Arsenic ($\mu\text{g/l As}$) DETS 042	Cadmium ($\mu\text{g/l Cd}$) DETS 042	Chromium ($\mu\text{g/l Cr}$) DETS 042	Lead ($\mu\text{g/l Pb}$) DETS 042	Mercury ($\mu\text{g/l Hg}$) DETS 015	Selenium ($\mu\text{g/l Se}$) DETS 017	Copper ($\mu\text{g/l Cu}$) DETS 042	Nickel ($\mu\text{g/l Ni}$) DETS 042	Zinc ($\mu\text{g/l Zn}$) DETS 042	Boron ($\mu\text{g/l B}$) DETS 020
BH 04			W	14334/1	<1	<2	<10	<10	<0.2	<3	7	<10	90	530
BH 05			W	14334/2	<1	<2	<10	20	<0.2	<3	5	80	210	440
BH 17			W	14334/3	<1	<2	10	10	<0.2	<3	11	70	480	340
BH 18			W	14334/4	<1	<2	<10	<10	<0.2	<3	10	<10	320	530

Client Reference: 04014

Laboratory Reference: 14334

NORTH GAWBER SITE

Summary of Chemical Analyses on Water Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide	Sulphide	Sulphate content		pH	Total Phenols *	Total PAH #	Total Petroleum Hydrocarbons
					(µg/l CN)	(µg/l S ²⁻)	(mg/l SO ₃)	(mg/l SO ₄)	Value	(µg/l)	(µg/l)	(µg/l)
					DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 054	DETS 052	
BH 04			W	14334/1	<20	810	210	252	7.7	<0.5	0.4	1200
BH 05			W	14334/2	<20	810	4400	5280	5.9	<0.5	4.9	6600
BH 17			W	14334/3	<20	<500	1900	2280	6.2	<0.5	0.98	1100
BH 18			W	14334/4	<20	810	720	864	6.5	<0.5	7.3	1100

Client Reference: 04014

Laboratory Reference: 14334

NORTH GAWBER SITE

Summary of Chemical Analyses on Water Samples

	Arsenic	Cadmium	Chromium	Lead	Mercury	Selenium	Copper	Nickel	Zinc	Boron
	(µg/l As)	(µg/l Cd)	(µg/l Cr)	(µg/l Pb)	(µg/l Hg)	(µg/l Se)	(µg/l Cu)	(µg/l Ni)	(µg/l Zn)	(µg/l B)
	DETS 042	DETS 042	DETS 042	DETS 042	DETS 015	DETS 017	DETS 042	DETS 042	DETS 042	DETS 020
<i>Date Analysed</i>	15/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	08/10/2004	11/10/2004	11/10/2004	11/10/2004	18/10/2004
	Total Cyanide	Sulphide	Sulphate content		pH Value	Total Phenols *	Total PAH #	Total Petroleum Hydrocarbons		
	(µg/l CN)	(µg/l S ²⁻)	(mg/l SO ₃)	(mg/l SO ₄)		(µg/l)	(µg/l)	(µg/l)		
	DETS 021	DETS 024	DETS 004	DETS 004	DETS 008	DETS 054		DETS 052		
<i>Date Analysed</i>	15/10/2004	15/10/2004	09/10/2004		15/10/2004	18/10/2004	14/10/2004	18/10/2004		

Client Reference: 04014

Laboratory Reference: 14334