

Application Site Condition Report

**Grid Powr Limited
EfW Plant
Houghton**

Prepared by:
Sol Environment Ltd

Date:
June 2023

Project Issue Number:
SOL_22_P096_GP

VERSION CONTROL RECORD			
Contract/Proposal Number:		SOL_22_P096_GP	
Authors Name:		Dudley Saunders	
Issue	Description of Status	Date	Reviewer Initials
1	First Submission to the Environment Agency	1 st June 2023	EH

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INTRODUCTION

This Application Site Report has been prepared for Grid Powr Limited (hereafter referred to as 'The Applicant') in support of a Bespoke Installations Permit Application under The Environmental Permitting (England and Wales) Regulations 2018 (as amended) for the operation of an Energy from Waste (EfW) Plant located at Houghton Main Energy Centre.

This document represents the Application Site Condition Report (ASCR) submitted as part of the Application package to the Environment Agency (EA) and has relied on information supplied by the site and various third-party information sources (See Section 2).

The facility ('the Site') is located at Park Spring Road, Barnsley, S72 7GX. National Grid Reference: SE 41709 06439.

The proposed development of the site comprises a non-hazardous waste incineration plant which utilises up to 145,000 tonnes per annum of pre-processed RDF to undergo close coupled combustion to generate power, which will then be exported to the national grid.

The proposed facility meets the definition of an Installation as defined by Section 5.1 'Incineration and Co-Incineration of Waste' paragraph A(1)(b) namely:

'The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour.'

This document has been prepared in accordance with the EA's Guidance Document H5 Site Condition Reports Guidance and Templates (Version 2.0, dated 04/08/08). This report provides baseline information in relation to the site.

1. SITE DETAILS

Table 1.1: Site Details

Name of the Applicant:	Grid Powr
Activity Address:	Houghton Main Energy Centre, Park Spring Road, Barnsley, S72 7GX.
Grid Reference:	OS X (Eastings) 441640 OS Y (Northings) 406444
Document References:	EP Application Site Condition Report, Grid Powr Ltd Document reference and date: SOL_22_P096_GP May 2023
Annexes:	Annex A: Figures Annex B: Groundsure Report Annex C: Site Photographs Annex D: Conceptual Model Annex E: Ground Investigation Report

2. CONDITION AT PERMIT ISSUE

2.1 Site Setting

The location of the subject Site is shown in drawing CO02, Annex A, with the site being at approximate National Grid Reference SE 41709 06439. The proposed site layout is shown in drawing PD-01-22-BD-100_rev0 found in Annex A.

The site is located at Houghton Main Energy Centre, Park Spring Road, Barnsley, S72 7GX.

The application site is located to the north of the town of Darfield, to the north, east, south, and west is heavily dominated by agricultural or rural land. The site is bound to the south, north and west by agricultural sites, with the east being bound by the A6195. The River Dearne is located approximately 10m to the north of the proposed development, running north south along the western border. It is well connected by existing infrastructure corridors such as the A6195, further connecting to the M1.

The site is roughly triangular in shape and covers an area of approximately 4.9 hectares. The site currently comprises a car park area on the north-eastern extent of the site, which is on concrete hardstanding and will remain unchanged. The remainder of the site consists of undeveloped and rural land. The nearest residential area to the site is Ings Lane which lies approximately 625m south of the site immediately west of the A6195 road.

Table 2.1 below provides information regarding the surrounding site.

Table 2.1: Site Setting	
Direction	Observations
North	Immediate Vicinity: Disused Railway. Within 500m: Rural Land, Agricultural Land, Line of Trees. Beyond 500m: A6195, Rural Land, Agricultural Land, Grimethorpe Nature Reserve.
North East	Immediate Vicinity: A6195. Within 500m: Woodland, Agricultural Land, Unnamed Road, Wind Turbine. Beyond 500m: Agricultural Land, Wind Turbine, Rural Land.
East	Immediate Vicinity: A6195. Within 500m: Warehouse, Rural Land Beyond 500m: Agricultural Land, Woodland, Rural Land.
South East	Immediate Vicinity: A6195. Within 500m: Warehouse, Woodland, Agricultural Land, Unnamed Road, Wind Turbine. Beyond 500m: Agricultural Land, Woodland, Rural Land, Residential Dwellings (Middlecliff Lane).
South	Immediate Vicinity: Rural Land. Within 500m: River Dearne, Agricultural Land, Beyond 500m: Agricultural Land, Residential Dwellings (Ings Lane).
South West	Immediate Vicinity: Rural Land.

	<p>Within 500m: River Dearne, Agricultural Land, Woodland. Beyond 500m: Agricultural Land, Residential Dwellings (Lane Edderthorpe Lane).</p>
West	<p>Immediate Vicinity: Rural Land. Within 500m: River Dearne, Agricultural Land, Woodland, RSPB Dearne Valley – Houghton Washlands, Line of Trees. Beyond 500m: Agricultural Land, RSPB Edderthorpe Flash, Rural Land.</p>
North West	<p>Immediate Vicinity: Rural Land. Within 500m: River Dearne, Agricultural Land, Woodland, RSPB Dearne Valley – Houghton Washlands. Beyond 500m: Agricultural Land, Residential Dwellings (Crook House).</p>

2.1 Geology, Hydrogeology and Surface Waters

Desk-based research of the local geology, hydrogeology and surface waters has been carried out in order to establish the potential for migration of contamination onto or away from the Site, and to assess the surface water and groundwater sensitivity of the site area. Information was obtained from multiple sources, namely:

- Environment Agency Flood Risk Map;
- Information provided by Groundsure Reports (Annex B).
- Geological maps produced by the British Geological Survey (BGS) and the BGS Geology of Britain Viewer (<http://maps.bgs.ac.uk/geologyviewer>);
- MAGIC (<http://magic.defra.gov.uk>); and
- BGS Borehole Record Viewer (<http://www.bgs.ac.uk/data/boreholescans/home.html>).

2.2.1. Geology

According to BGS Geological Mapping, the majority of the site is not underlain by superficial deposits. A small corner in the north-western area of the site is underlain by superficial Alluvium deposits which typically consists of clay, silt sand and gravel.

The BGS records the underlying bedrock of the site as the Pennine Middlecoal Measures Formation. The Pennine Formation is described in the BGS lexicon as *‘Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit.’*

Bedrock geology onsite was identified during ground investigations at shallow depths below Made Ground.

Made Ground

Made Ground is recorded onsite in geological mapping and was encountered during ground investigation. The Made Ground is seen to be associated with the backfill of the open cast coal pit. The permeability of the Made Ground is shown as very high to very low reflecting the mixed nature of the materials. The thickness of the Made Ground has been identified as ranging from 0.3m to 27.4m.

Radon Potential

According to data issued by the British Geological Survey and Public Health England, the site is located in an area that has an elevated radon potential, meaning the maximum radon potential is 1-3%. This means no Radon Protection Measures are required.

Shrink Swell

The maximum shrink swell hazard rating identified on the application site is negligible to very low to low.

Landslides

The maximum landslide hazard rating identified on the application site is very low to low.

Soluble Rocks

The maximum soluble rock hazard rating identified on the application site is Negligible.

Compressible Ground

The maximum compressible ground hazard rating identified on the application site is negligible to very low.

Collapsible Rocks

The maximum collapsible rocks hazard rating identified on the application site is very low to negligible.

Running Sands

The maximum running sand hazard rating identified on the application site is Negligible to low.

2.2.2. Hydrogeology

The Environment Agency classifies the superficial geology deposits as a Secondary A aquifer and classifies the underlying bedrock as another Secondary A aquifer. The superficial deposits have very low to low permeability, with the bedrock having between a low-high permeability depending on the specific lithology. This suggests that the bedrock geology could provide base-flow to water courses, with a watercourse being close to site this has moderate potential.

The groundwater bodies on site are identified as Don & Rother Millstone grit & Coal Measures, given an overall rating of 'poor', chemical rating of 'poor' and quantitative 'Good' rating in 2019.

The site is not located within a Source Protection Zone (SPZ).

No zones of groundwater vulnerability were identified at the site.

There is one active groundwater abstraction license within 2 km of the site, this is found 1282m north of the site, for process water uses. The licence number is No: 2/27/08/137/R01 and the annual volume is 15,000m³, the expiry date is the 31/03/2029.

The site is considered to be situated in an area of moderate sensitivity with respect to groundwater resources as it is situated upon an unprotected secondary A Aquifer and there is an active groundwater abstraction within 2km.

2.2.3. Surface Water

The nearest surface water feature is the River Dearne, approximately 36m west of the site, the Dearne was classified by the Environment Agency in 2019 as having a 'moderate' ecological status, and 'failing' chemical status and overall 'moderate' water body rating status.

There is one identified active surface water abstraction recorded within 2 km of the site. This is found 1730m west of the site, used for spray irrigation. The licence number is 2/27/08/090 and the annual volume is 180,000m³.

The Environment Agency's flood risk map indicates that the site primarily lies within Flood Zone 1, at low risk of flooding from rivers and the sea, with a small proportion of the northern and western extent residing in flood zone 2. The maximum flood risk (Zone 2) for this area is land assessed as having a chance of flooding of greater than 1 in 1000 (0.1%) chance of flooding each year. There have been no historical recorded flood events recorded within 250m. In addition, the site is within 50m of an area susceptible to groundwater flooding. There are flood defences present along the River Dearne.

The site is considered to be in an area of moderate sensitivity in regard to surface water due to partially residing in Flood Zone 2, but having measures addressing this.

2.3. Designated Sites

Environment Agency H1 and H5 guidance states that the potential impacts of the site should be assessed for the following habitat sites within 10km of the Installation:

- Special Areas of Conservations (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive;
- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive; and
- Ramsar Sites designated under the Convention of Wetlands of International Importance.

It is also stated that within 2km of the Source:

- Sites of Special Scientific Interest (SSSI) established by the 1981 Wildlife and Countryside Act;
- National Nature Reserves (NNR);
- Local Nature Reserves (LNR);
- Local Wildlife Sites (LWS), County Wildlife Sites (CWS) and potential wildlife sites (PWS);
- Sites of Importance for Nature Conservation (SINC); and

- Ancient Woodland.

Information from the Multi Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.defra.gov.uk/>) has been used to obtain the above information.

There is an SSSI within 2km of the site, as well as Ancient Woodlands and an LNR. The designated sites relevant to this study are presented in Table 2.2 below:

Distance and Direction	Name	Status
8m W	Dearne Valley Wetlands	SSSI
570m NE	Little Park	Ancient Woodland
1006m NW	Storrs Wood	Ancient Woodland
1247m N	Carlton Main Brickworks	SSSI
1550m N	Westhaigh Wood	Ancient Woodland/LNR
1913m W	Unknown	Ancient Woodland

The site is not located in an Air Quality Management Area.

The proposed operation will have little environmental emissions to land or controlled waters and emissions to atmosphere are well managed and controlled, therefore it is the conclusion of this assessment that there will be no direct or indirect effects on any of the statutory sites described above.

2.4. Pollution History

Environmental Database Records

The following information has been obtained from a search of a publicly available database of environmental information (Groundsure Insight Report, provided in Annex B).

The database contains records of information from public registers held by environmental regulatory authorities and can be used to assess the site's sensitivity, the potential for neighbouring activities to pose a risk to the site and to determine whether specific records of pollution relate to the subject site.

Pollution Incidents

There are no recorded Pollution Incident within 500m of the site.

Potentially Contaminative Industrial Sites

There are four potentially contaminative industrial site within 250m of the application, they are found in Table 2.3 below.

Table 2.3: Potentially Contaminative Industrial Sites within 250m			
Company / Feature	Distance and Direction	Details	Category
Electricity Sub Station	On Site	Electrical Features	Infrastructure and Facilities
Electricity Generating Station	21m S	Energy Production	Industrial Features
Electricity Sub Station	148m SE	Electrical Features	Infrastructure and Facilities
Park Spring Turbine	206m NE	Energy Production	Industrial Features

Landfills and Waste Sites

There are no active landfill sites recorded within 2 km of the site, however there is one active waste disposal site within 2km, this is located 1472m north of the site, and is permitted to store up to 75,000 tonnes of inert material. There are also four historical landfill sites, which are summarised in the table below.

Table 2.4: Historical Landfills and waste sites within 500m of the site		
Company / Feature	Distance and Direction	Details
Ground Workings and Refuse Heap	344m E	Waste Licence: - Site Reference: - Waste Type: - Licence Issue: 1961
Quarry Park Lane	713m NE	Waste Licence: - Site Reference: - Waste Type: Commercial Licence Issue: -
National Coal Board	771m NW	Waste Licence: Yes Site Reference: 20B160(45), 4400/B106Q Waste Type: Industrial Liquid Sludge Licence Issue: 17/11/1977
New Park Spring Tip	1156m N	Waste Licence: Yes Site Reference: WD20B175, 4400/B175 Waste Type: Commercial Licence Issue: 11/01/1978
Carlton Main Brickworks	1403m N	Waste Licence: Yes Site Reference: WD20/B479, NE4242 Waste Type: Inert, Industrial Licence Issue: 21/10/1985

There are no waste exemption sites within 500m of the development.

Discharge Consents

There are no active but 7 historical Licensed Discharge Consent to controlled waters within 2km of the site. The details of these can be found below.

Table 2.5: Historical Licensed Discharge Consent to Controlled Waters within 2km

Address	Location	Distance and Direction	Details
Houghton main, sandhill, Barnsley, South Yorkshire	On site	Effluent type: trade discharges - unspecified Permit number: 3712 Permit version: 1 Receiving water: -	Status: revoked - unspecified Issue date: 12/09/1983 Effective date: 12/09/1983 Revocation date: 21/11/1994
Houghton main occs, consent Wra7231, South Yorkshire	71m sw	Effluent type: Trade Discharges - Site drainage (contam surface Water, not waste sit Permit number: wra7231 Permit version: 1 Receiving water: River Dearne	Status: new consent, by Application (wra 91, section 88) Issue date: 23/10/1996 Effective date: 23/10/1996 Revocation date: 07/05/1997
Ncb,houghton main colliery, Surface, drainage interceptor	245m se	Effluent type: trade discharges - Unspecified Permit number: 3505 Permit version: 1 Receiving water: -	Status: revoked - unspecified Issue date: 12/09/1983 Effective date: 12/09/1983 Revocation date: 15/02/1991
Little houghton stw, little Houghton, barnsley, South Yorkshire	413m s	Effluent type: sewage Discharges - final/treated Effluent - water company Permit number: e284 Permit version: 1 Receiving water: River Dearne	Status: transferred from R(pp)a 1951-1961 Issue date: 08/11/1973 Effective date: 08/11/1973 Revocation date: 31/05/1981
Houghton main occs, consent Wra7231, South Yorkshire	435m se	Effluent type: Trade Discharges - Site drainage (contam surface Water, not waste sit Permit number: wra7231 Permit version: 1 Receiving water: River Dearne	Status: new consent, by Application (wra 91, section 88) Issue date: 23/10/1996 Effective date: 23/10/1996 Revocation date: 07/05/1997

Authorised or Permitted Processes

There are no recorded historical Notification of Installations Handling Hazardous Substances (NIHHS) site within 500m.

2.5. Historical Land Uses

Available historic maps for the site have been reviewed to determine if there is the potential for contamination to be present on Site associated with the Sites historical uses.

Earliest available mapping in 1854 shows the site is primarily utilised for agricultural purposes, however there is a railway running northwest, southeast along the bottom corner of the site. Several villages are also present, including Edderthorpe, approximately 780m southwest to the site boundary. With multiple farms found here. The entirety of the area is in keeping with this, with the land primarily used for agricultural purposes. The River Dearne is found approximately 30m west of the site boundary. A quarry is also identified approximately 800m north of the site.

The next available mapping from 1890 shows the development of Houghton Main Colliery, found approximately 100m southeast of the site. This colliery connected to the railway and was less than 50m from the River Dearne. There were no significant changes in the remainder of the area.

In 1904 a second railway line is present to the north of the existing line, found to border the northern extent of the site; a further line is found to dissect the site into two halves from the north to the south. The colliery works has enlarged and includes a sewage works 300m southeast, development is also seen in the surrounding villages, most notably Great Houghton.

Further increase of development to the colliery works size is seen at the next available mapping in 1931, seeing spoil heaps and an aerial cable present, as well as further development to Little Houghton, with housing getting closer to the colliery works.

There are little changes seen in the surrounding area by the next mapping in 1955, however the sewage works at the Colliery is no longer labelled, indicating closure of the works.

The site does not see change until 1981, where the onsite railway lines see dismantling to all tracks. Pump houses can also be seen approximately 800m northwest of the site boundary. The surroundings see changes made to the colliery works, with equipment reorganised, this moves some works closer to site, with buildings now present 50m southeast of the site.

More growth is seen to the colliery works with further spoil heaps added to the northeast in 1983-1993.

The site and surroundings sees further dismantling of the railway in 2001, the surroundings see the end of the colliery works now labelled as a quarry, with demolition occurring and no buildings remaining, spoil heaps to the northeast remain. The Park Spring Road is also present on this version of mapping,

running 80m north of the site. Mapping from 2010 show development of a large development 100m east of the site, as well as the road being brought closer to the boundary of the site.

The most recent mapping from 2023 shows the Great Houghton Quarry previously found to the north of the site to be gone, a lake is also located 250m northwest of the site.

Potentially contaminative historical land uses have been summarised in the table below. Please refer to Annex B for the historical maps.

Table 2.6: Potentially Contaminative Land Uses	
Activity	Contaminants
Onsite	
Railway	Various contaminants including heavy metals, organic and inorganics
Cuttings	Various contaminants including organics and inorganics
Offsite	
Colliery	Various contaminants including hydrocarbons, heavy metals, organic and inorganics and ground gas
Railway	Various contaminants including heavy metals, organic and inorganics
Cuttings	Various contaminants including organics and inorganics
Pond	Various contaminants including heavy metals, organic and inorganics and ground gas

2.6. Site Reconnaissance

2.6.1. Visual/Olfactory Evidence of Existing Contamination

All areas of the site have been subject to a visual inspection at the time of this application by Sol Environment Ltd. A site visit was undertaken on the 9th of December 2022 by trained consultants from Sol Environment Ltd.

All aspects of the installation boundary have been inspected.

The site is predominantly disused vegetated ground with an area of recently laid hardstanding. No contamination or spillages were observed during the site walkover.

There were no tanks or raw materials stored on site.

At the time of the site walkover, there was no sign of any potentially contaminative uses.

2.7. Evidence of Historic Contamination

2.7.1. Previous Site Investigations

Previous ground investigations have been undertaken at the site and are summarised below. Original reports are provided in Annex E.

2.7.1.1. Enzygo (Southern) Ltd, January 2015

Enzygo undertook a targeted ground investigation in January 2015 in support of a planning application for a Timber Resource Recovery Centre. The combined programme of works comprised:

- The drilling of 5 window sample boreholes;
- Environmental samples taken from Made Ground and materials that identified visual signs of contamination;
- The subsampling of borehole recovery for soil contamination testing;
- Advancement of 20 trial pit locations;
- Ground gas and groundwater monitoring through exploratory holes;
- Advancement of 2 hand pit locations; and
- Drilling of one deep borehole location.

The locations of the boreholes and trial pits were situated so as to provide wide site coverage.

Samples for chemical analysis were sent to the Environmental Laboratories Ltd who are NAMAS and MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, banded Total Petroleum Hydrocarbon (TPH) and asbestos screen.

Given that no groundwater was encountered leachate analysis was taken from soils samples and was carried out by Environmental Laboratories Ltd who are NAMAS and MCERTS accredited.

Please refer to the report provided in Annex E of this report for detailed results of the fieldwork investigation. A brief summary of the baseline conditions encountered at the site is provided below.

Ground Conditions

Made Ground was encountered across the site and was noted to comprise up to 4 layers of compacted material's comprised sandy gravelly clay over slightly sandy gravel with some cobbles and boulders of mudstone. Localised fragments of brick and ash were also encountered. These materials were proved to depths to in excess of 4.45mbgl.

Groundwater

No groundwater was identified during the ground investigation works, due to this leachate analysis was undertaken. Samples of groundwater collected from the borehole installation have been compared against the EQS values included above. The only exceedance was fluoranthene (0.04ug/l) which exceeds

the EQS value of 0.02ug/l. Given this is the only a marginally exceedance and there are no abstractions or source protection zones within 1000m of the site it is considered that the risk to controlled waters can be dismissed.

Ground Gas

Monitoring was undertaken during the 4 return visits to monitor groundwater levels and gas. Ground gas has not recorded elevated concentrations of Methane, however, has recorded Elevated Carbon Dioxide above 5%. No detectable gas flow rates were measured with the gas flux falling into Characteristics Situation 1. This is consistent with site observations showing Made Ground with no putrescible material. Therefore, the potential risk from ground gas is dismissed.

Soil Chemical Analysis Results

In general, no widespread evidence of contamination was identified across the site, with all concentrations of contaminants identified as below the relevant screening values for commercial end use. Baseline soil contamination data is provided in Table 2.7 below.

Table 2.7: Summary Soil Analytical Results				
Contaminant	Unit	Minimum Concentration	Maximum Concentration	Location of Maximum
<i>Metals</i>				
Arsenic	mg/kg	8.4	100	TP9
Cadmium	mg/kg	<0.5	<0.5	
Chromium	mg/kg	26.6	43.8	TP3
Copper	mg/kg	30	63.1	TP20
Lead	mg/kg	22	50.9	TP20
Mercury	mg/kg	<0.5	<0.5	
Nickel	mg/kg	34.6	60.9	WS5
Selenium	mg/kg	0.7	2.7	TP9
Zinc	mg/kg	64.9	136	WS5
<i>Inorganics</i>				
Hexavalent Chromium	mg/kg	<0.8	<0.8	
Total Cyanide	mg/kg	<1	<1	

For further detail please refer to the report in Annex E.

2.7.1.2. Enzygo (Southern) Ltd, September 2014

A previous contamination assessment was also undertaken by Enzygo Ltd for Peel Environmental Management Ltd in late 2014. The proposed development was for a Renewable Energy Park comprising a Timber Resource Recovery Centre and an Anaerobic Digestion facility. This report used the same data as previously discussed in the January 2015 report, for this reason it will not be discussed further.

2.7.1.3. William Saunders Partnership, June 2008

This geotechnical report was conducted for a proposed industrial / commercial unit complex. This investigation identified no significant ground contamination, with risk to development workers considered low, however due to possibilities of ground gas, controls during excavations were recommended. Leachability testing indicated a low risk of pollution to controlled waters.

A summary of the encountered ground conditions is provided below.

Ground Conditions

Made ground at the site comprised two distinct layers of material, mottled brown and grey sandy as well as gravelly clay from the ground surface, overlying light grey-blue clayey gravel with rare to some cobbles of mudstone.

Groundwater

Groundwater was not identified at shallow depths. Groundwater encountered in boreholes was found to be concurrent with the regional groundwater levels within shallow mine workings.

Ground Gas

Ground gas monitoring was undertaken on 3 occasions of 5 boreholes. Methane was not detected in excess of 0.1%. No significant gas flow or concentrations were identified.

In general, no widespread evidence of contamination was identified across the site, with all concentrations of contaminants identified as below the relevant screening values for commercial end use.

2.7.2. Supporting Information

The supporting documentation consist of:

- Figures detailing the location, boundary and layouts of the Installation are shown in Annex A.
- Groundsure Reports are provided within Annex B
- Site Photographs are in Annex C.
- A Conceptual Model of the site is shown in Annex D.
- The previous Ground Investigation Reports are provided in Annex E.

3. PERMITTED ACTIVITIES

3.1 Proposed Activities Undertaken at the Installation

3.1.1. Description of Process

The proposed facility will use a maximum of 145,000 tonnes per annum of pre-processed recovered waste derived fuels to undergo a high efficiency energy generation plant that utilises advanced thermal technology as a cost effective means of processing RDF feedstocks to produce a combustible synthesis gas which will be used to raise steam and generate energy. The following process will be followed:

- **Waste Acceptance and Reception:** Refuse Derived Fuel (RDF) will be delivered directly to the Fuel Reception Hall. HGV's will unload in the internal tipping area and a visual inspection will take place. The delivered RDF feedstocks will then be transferred either directly to the pre-processing plant or to one of two fuel bunkers. The RDF will be stored within the temporary storage area for no longer than 1 day before being transferred to the pre-processing plant.
- **Mechanical Polishing Plant:** The inspected RDF feedstocks will then be transferred directly to the pre-processing equipment which consists of two shredders, two magnetic separators and two eddy-current separators. Once pre-processed the RDF will then be transferred to one of two bunkers for storage prior to loading via crane into the combustion system.
- **Two-Stage Combustion:** The site will have two combustion / gasification lines each with an independent fuel feed system. The fuel feed system will deliver the waste into the system where the waste will be gasified to produce a synthetic gas (syngas). The syngas is then combusted for the purposes of raising superheated steam through a steam boiler plant.
- **Electricity Generation:** The superheated steam then passes to a Steam Turbine and Generator for the production of renewable electricity with a gross electrical output of up to 16MWe.
- **Flue-Gas Cleaning:** Flue gas cleaning and pollution control consists of Selective Non-Catalytic Reduction (SNCR) through ammonia hydroxide injection within the combustion chambers, sodium bicarbonate injection for acid gas neutralisation and activated carbon powder injection for absorption and removal of heavy metals, dioxins, VOCs and other harmful substances. The resulting flues gases are subsequently filtered through a modular gas filtration system and passed through a Selective Catalytic Reduction (SCR) to facilitate further NOx and ammonia slip reduction.

3.1.2. Substances Used at the Installation

A summary of the substances which may present a pollution risk can be seen in the table overleaf.
All re-fuelling of site vehicles and mobile plant takes place upon impermeable concrete hardstanding.

Table 3.1: Summary of Potentially Polluting Substances

Substance	State	CAS No.	Risk Phrases (CHIP)	Hazard Substance? Yes/No	Potential Pollution Risk	Environmental fate and behavior	Quantity	Storage Arrangements	Comments
Ammonia	Gaseous	7664-41-7	R34, R50	Yes	Very Low	In water, ammonia volatilizes to the atmosphere, is transformed to other nitrogenous compounds, or may be bound to materials in the water. In soil, ammonia may either volatilize to the atmosphere, adsorb to particulate matter, or undergo microbial transformation to nitrate or nitrite anions.	1235 tonnes per annum	Stored in 2 x 50m ³ internal bunded tanks	Gaseous state renders pollution risk to ground, groundwater or surface water very low
Refuse Derived Fuel	Solid	N/A	N/A	No	Very low	Variable due to nature of waste but typically inert	145,000 tonnes per annum	Stored internally within the Fuel Reception Hall	Storage internally upon impermeable concrete hardstanding minimizes risk of contamination
Diesel / Fuel Oil	Liquid	68476-34-6	R40, R51/53, R65, R66	Yes	Very Low	Relative rapid evaporation and dissolution rates in water column (surface winds expedite these qualities), not prone to form stable emulsions, has relatively high	TBC	90m ³ double walled tank 1000l internal fuel tank (double walled)	The storage arrangements for the diesel will be located on impermeable

Table 3.1: Summary of Potentially Polluting Substances

Substance	State	CAS No.	Risk Phrases (CHIP)	Hazard Substance? Yes/No	Potential Pollution Risk	Environmental fate and behavior	Quantity	Storage Arrangements	Comments
						aquatic toxicity, rapid natural degradation or remediation in water and surface sediments on the order of days to months.		and automatically refuelled from 90m ³ tank)	hardstanding, reducing the chance of ground contamination. There will also be safety procedures to minimise the chance of spillages.
Water Treatment Chemicals	-	-	-	-	-	-	-	Internal banded storage tanks <5m ³	-
Lubrication, Hydraulic and Turbine Oils	Liquid	Various	-	-	-	-	-	Stored in a 1,000 litre tank	-
Activated Carbon	Solid	7440-44-0	None	No	Low	If released to soil it will have low mobility, with volatilization expected from moist surfaces. If released to water it is not	100 tonnes per annum	Two internal banded silos (70m ³)	Hazard risk from this substance is low, it has low mobility and will

Table 3.1: Summary of Potentially Polluting Substances

Substance	State	CAS No.	Risk Phrases (CHIP)	Hazard Substance? Yes/No	Potential Pollution Risk	Environmental fate and behavior	Quantity	Storage Arrangements	Comments
						expected to adsorb to suspended solids and sediment, with biodegradation occurring.			be stored indoors, on hardstanding.
Sodium Bicarbonate	Solid	144-55-8	None	No	Very Low	High water solubility and low vapour pressure indicate that sodium carbonate will be found predominantly in the aquatic environment. In water, sodium carbonate dissociates into sodium and carbonate and both ions will not adsorb on particulate matter or surfaces and will not accumulate in living tissues. If sodium carbonate is emitted to soil it can escape to the atmosphere as CO ₂ , precipitate as a metal carbonate, form complexes or stay in solution. Solid sodium bicarbonate has a negligible vapour pressure and for this reason it will not be distributed to the atmosphere.	1,955 tonnes per annum	Two internal banded silos (80m ³)	Due to the low hazard risk of the substance, paired with it being stored on concrete hardstanding with a bund, contamination is not thought to be likely.

Table 3.1: Summary of Potentially Polluting Substances

Substance	State	CAS No.	Risk Phrases (CHIP)	Hazard Substance? Yes/No	Potential Pollution Risk	Environmental fate and behavior	Quantity	Storage Arrangements	Comments
Maintenance Fluids (grease, oil etc)	Various	Various	-	-	-	-	-	Maintenance area	-
CEMS Calibration Gases	Gas	Various	-	-	-	-	-	Stored within 50l cylinder	-
Boiler Chemicals	Solid	Various	-	-	-	-	-	Internal 1m ³ IBC's <ul style="list-style-type: none"> • Chemical oxygen scavenger (as NALCO 4221) – 4 x 1 m³ • Condensate corrosion inhibitor (as NALCO 72310) – 4 x 1 m³ 	-

Table 3.1: Summary of Potentially Polluting Substances

Substance	State	CAS No.	Risk Phrases (CHIP)	Hazard Substance? Yes/No	Potential Pollution Risk	Environmental fate and behavior	Quantity	Storage Arrangements	Comments
								Boiler internal treatment (as NALCO 72215) 4 x 1 m ³	

3.1.3. Waste

All RDF waste accepted onto site is subject to waste acceptance and rejection procedures and stored appropriately.

Table 3.2: Proposed Feedstock EWC Codes and Types

Waste Code	Description
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	MUNICIPAL WASTE AND SIMILAR MATERIALS FROM COMMERCE AND INDUSTRY
20 03	other municipal wastes
20 03 01	mixed municipal waste

3.1.4. Drainage Systems

There will be no direct process emissions to controlled water arising from the Installation.

Uncontaminated clean surface water runoff captured from roof drainage and external roadways / car parking areas will be discharged to the surface water drainage system (W1).

Any effluent arising from the process plant will be collected in an effluent collection tank and discharged via sewer (S1). There will be a maximum of 4m³/hr of effluent discharged to sewer which will mainly consist of treated effluent from the water treatment plant.

All domestic foul effluent arisings will also be discharged via sewer.

Given that the site is located on a Secondary A bedrock aquifer, insinuating that the strata has high permeability. Infiltration is considered to be viable, however as the site is located on impermeable hardstanding this is not thought to be likely. Surface water runoff will be discharged to the site wide surface water drainage system. This will be a sealed drainage system, that incorporates SUDs and will ensure that all potentially polluted runoff is controlled, managed and retained on site.

3.1.5. Hardstanding

The site will be completely underlain by impermeable concrete hardstanding.

3.1.6. Tanks and Bunds

All storage tanks will be installed with secondary containment and be designed to comply with the necessary standards and guidance. All storage tanks associated with the process are detailed within Table 3.1.

3.2. Potential for Fugitive Releases to Soil, Groundwater and Surface Water

The materials and substances used at the site are not considered to have significant potential to cause ground or groundwater contamination under general storage or operating procedures.

The following measures have been incorporated into the design of the activity to protect groundwater and soil from installation substances;

- The site operations take place on impermeable hardstanding;
- All waste processing at the site takes place internally;
- All chemicals are stored on impermeable hardstanding at indoor locations;
- Emergency spill kits are available in the event of a spillage; and
- Vehicles are covered when deliveries take place.

When operated in the manner described above the proposed operations will not introduce any sub surface or potentially polluting activities to the site.

Due to the protection measures mentioned above, the risk to soil and groundwater from the development is considered to be LOW as summarised in the Conceptual Site Model below.

Table 3.3 Conceptual Site Model

Contaminant Source	Contaminants of Concern	Receptor	Exposure Present?	Pathway	Likelihood of Risk
Historical soil contamination within Ground generally associated colliery and industrial workings (railway) which are on site, or which surround the site	Specific contaminants associated with colliery works including hydrocarbons high pH, heavy metals, PCBs, PAHs, phenols.	Construction Workers	Yes – Potential pathway during construction of the site, full PPE will be worn by workers during the construction phase to limit contact.		Very Low – Use of control measures during construction work should minimise potential exposure. Ground investigations have not identified gross contamination however all future works will include appropriate PPE.
		Future Site Users	Yes – Areas of soft landscaping are present in the wider site area.		Low – Hardstanding will cover the operational areas of the site and gross contamination has not been identified onsite.
		Groundwater	Yes – Leaching of contaminants by infiltrating rainfall is possible in areas of soft landscaping.		Low – Majority of the site is covered by hardstanding and no widespread contamination identified.

		Surface Water	Yes – Areas of soft landscaping are present in the wider site area allowing dissolution of contaminants into surface water run-off.	Low – Hardstanding covers the operational areas of the site and no widespread contamination identified.
Substances either stored on site, used or generated during processing	Polluting substances created in processing, specifically NO _x and CO ₂ emitted from the stacks	Soil	Yes – All materials on site will be stored and processed on hardstanding, removing the potential for contamination of this receptor.	Low – The flue gases created from the processing are reduced in contaminants from carbon high temperature flue gas abatement, therefore greatly reducing this risk.
		Surface Water	Yes – The process discharge has the potential to hold contaminants.	Negligible – Effluent treatment processes that are installed reduce the contaminants present in the process effluent to acceptable levels.
		Ground Water	Yes – The process discharge has the potential to hold contaminants, as well as hazardous substances which are used.	Negligible – The hard standing that covers the operational areas ensure no contamination will be present for ground water that surrounds the site.
		Human Receptors	Yes – The stack emissions have the potential to impact nearby sensitive receptors.	Low – The abatement technology used in the stack will reduce contaminants in the flue gases.
		Ecological Receptors	Yes – The stack emissions have the potential to impact nearby sensitive receptors.	
	Polluting substances used or stored for the operation, specifically RDF	Soil	No – All materials on site will be stored and processed on hardstanding, removing the potential for contamination of this receptor.	Low – All potentially polluting substances used at the facility are controlled by following strict risk assessment and guidance surrounding the storage, use and removal, thus reducing the risk. The operational areas of the site being covered in hard standing for all operational areas also greatly reduces the risk of contamination to the sensitive receptors.
	Human Receptors	Yes – There is a pathway present for this pollution to occur, with the operation utilising	Low – The management and guidance surrounding storage and use of contaminants helps to reduce this risk to low.	

			potentially polluting substances.	
		Surface Water	Yes – There is a pathway present for this pollution to occur, with surface water runoff from the site having the potential to contain polluting substances.	Low – Internal management systems surrounding storage of waste, including no outdoor storage of waste will reduce this risk.
		Ground Water	No – All materials on site will be stored and processed on hardstanding, removing the potential for contamination of this receptor.	Negligible.
		Ecological Receptors	Yes – There is a pathway present for this pollution to occur, with the operation utilising potentially polluting substances.	Low – Although there is a risk to internal management systems surrounding storage of waste, including no outdoor storage of waste will reduce this risk.

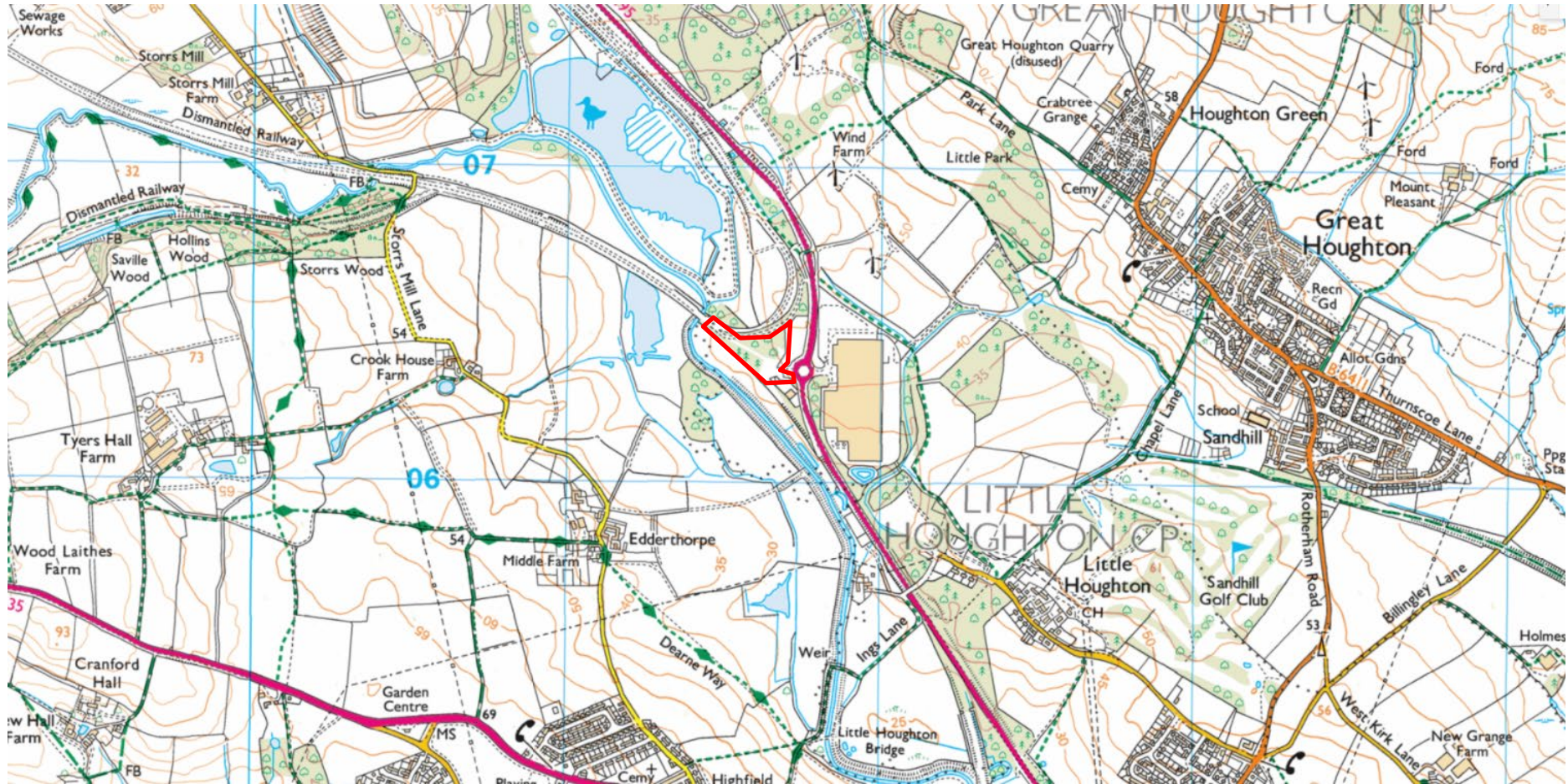
In addition, the site operates in accordance with the environmental management system. The management system includes visual inspections of:

- All storage areas, processing areas and hard standing will be physically inspected to detect any signs of deterioration, leaks or spillage. Any corrective action required is reported to and implemented by the Site Manager; and
- Equipment in all process areas as part of the company’s planned/predictive maintenance programme.

Based on this assessment, the potential for the varied site to impact on soil and groundwater underlying the installation is considered to be low.

Non-permitted activities undertaken at the Installation	Not applicable
Plan showing activity layout	Refer to Figure A2, Annex A
Environmental Risk Assessment	See attached Main Application Document SOL_22_P096_GP.

ANNEX A: FIGURES



(OS licence Ref: 100062750)

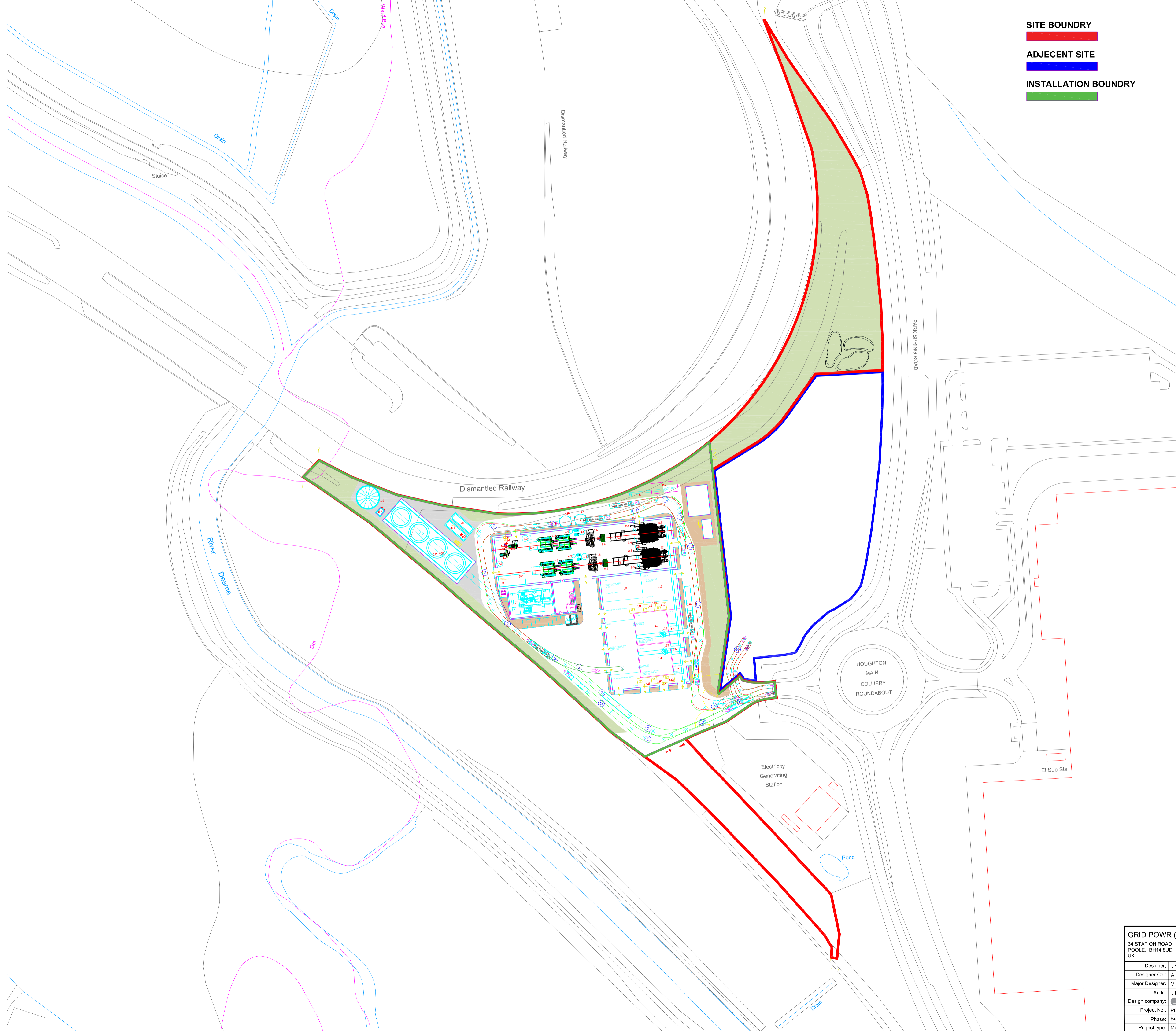
1. Do not scale off this drawing
2. All dimensions to be confirmed on site
3. This drawing is copyright of Sol Environment Ltd
4. This drawing is to be read in conjunction with relevant consultant drawings and specifications

Rev:	Date:	Desc:
0	MAY 23	Original

Client:	GRID POWR (UK) LTD
Project:	ENERGY RECOVERY FACILITY
Drawing Title:	SITE LOCATION

Job No:	SOL_22_PO96_GP
Date:	MAY 23
Drawn By:	SOPHIE RAINEY

Drawing No:	GP01
Revision:	0
Scale:	NTS



SITE BOUNDARY
ADJACENT SITE
INSTALLATION BOUNDARY

PLANT LIST

- 1 Fuel storage**
 - 1.1 Reception area 1 (RDF 300 mm)
 - 1.2 Quarantine area
 - 1.3 Main storage 1 (RDF 80 mm)
 - 1.4 Main storage 2 (RDF 80 mm)
 - 1.5 Feed hopper 1
 - 1.6 Feed hopper 2
 - 1.7 Spare and refuse hopper
 - 1.8 Shredder 1
 - 1.9 Magnet metal separator 1
 - 1.10 Eddy current separator 1
 - 1.11 Shredder 2
 - 1.12 Magnet metal separator 2
 - 1.13 Eddy current separator 2
 - 1.14 Separated metal bins
 - 1.15 Weighbridge IN
 - 1.16 Weighbridge OUT
 - 1.17 Spare area
 - 1.18 Overhead crane with grab 1
 - 1.19 Overhead crane with grab 2
- 2 HCU**
 - 2.1 HCU 1
 - 2.2 HCU 2
 - 2.3 Deashing system HCU 1 and Boiler 1 closed
 - 2.4 Deashing system HCU 2 and Boiler 2 closed
 - 2.5 Common closed ash chain transporter
 - 2.6 Common closed ash belt transporter
 - 2.7 Covered waterproof ash storage
- 3 Boiler**
 - 3.1 Boiler 1
 - 3.2 Boiler 2
 - 3.3 Economizer boiler 1
 - 3.4 Economizer boiler 2
 - 3.5 Feedwater tank boiler 1
 - 3.6 Feedwater tank boiler 2
- 4 Flue gas treatment**
 - 4.1 Bag filter 1
 - 4.2 Bag filter 2
 - 4.3 Bicarb silo 1
 - 4.4 Bicarb silo 2
 - 4.5 PAC silo 1
 - 4.6 PAC silo 2
 - 4.7 ID Fan 1
 - 4.8 ID Fan 2
 - 4.9 APCR silo 1
 - 4.10 APCR silo 2
 - 4.11 Stack (2 flues)
- 5 CEMS**
- 6 DeNOx**
 - 6.1 SCR 1
 - 6.2 SCR2
 - 6.3 Ammonia hydroxide tank and pumps
- 7 TG Set**
 - 7.1 Turbine and generator
 - 7.2 ACC
 - 7.3 Condensate and make-up tank
- 8. Water treatment**
- 9. High voltage**
 - 9.1 Own consumption
- 10. Control system**
 - 10.1 Control cabinets
- 11 Auxiliaries**
 - 11.1 Diesel generator
 - 11.1.1 Fuel oil tank
 - 11.3 Fire water tank
 - 11.4 Fire water pumps

GRID POWER (UK) Ltd. 34 STATION ROAD POOLE, BH14 8UD UK		Rev. 0	Investor: GRID POWER (UK) Ltd.
Designer: I. Vidović Designer Co.: A. Plevnik Major Designer: V. Plevnik Audit: I. Kreča Design company: ENERKON 10 000 Zagreb, Croatia Project No.: PD-01-22-BD Phase: Basic design Project type: Mechanical engineering project		Building: 2 x 25 MWh, 13,6 MWe - EW Houghton Main Content: Houghton Main INSTALLATION BOUNDARY	Draft No.: PD-01-22-BD-100-01 Sheet: 001/001 Scale: 1:1000 Date: October 2022

ANNEX B: ENVIRONMENTAL RECORDS

CAR PARK, ASOS, PARK SPRING ROAD, LITTLE HOUGHTON, BARNSELY, S72 7GX

Order Details

Date: 02/03/2023
Your ref: Grid_Powr
Our Ref: GS-9391715

Site Details

Location: 441672 406458
Area: 4.86 ha
Authority: [Barnsley Metropolitan Borough Council](#)



Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.13

groundsure.com/insightuserguide

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	<u>Historical industrial land uses</u>	23	4	28	53	-
19	1.2	<u>Historical tanks</u>	0	1	7	13	-
20	1.3	Historical energy features	0	0	0	0	-
20	1.4	Historical petrol stations	0	0	0	0	-
20	1.5	Historical garages	0	0	0	0	-
20	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
21	2.1	<u>Historical industrial land uses</u>	29	7	36	79	-
27	2.2	<u>Historical tanks</u>	0	1	8	16	-
28	2.3	Historical energy features	0	0	0	0	-
28	2.4	Historical petrol stations	0	0	0	0	-
29	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
30	3.1	Active or recent landfill	0	0	0	0	-
30	3.2	Historical landfill (BGS records)	0	0	0	0	-
31	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
31	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
31	3.5	<u>Historical waste sites</u>	0	0	0	1	-
31	3.6	Licensed waste sites	0	0	0	0	-
32	3.7	Waste exemptions	0	0	0	0	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
33	4.1	<u>Recent industrial land uses</u>	1	1	2	-	-
34	4.2	Current or recent petrol stations	0	0	0	0	-
34	4.3	Electricity cables	0	0	0	0	-
34	4.4	Gas pipelines	0	0	0	0	-
34	4.5	Sites determined as Contaminated Land	0	0	0	0	-



35	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
35	4.7	Regulated explosive sites	0	0	0	0	-
35	4.8	Hazardous substance storage/usage	0	0	0	0	-
35	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
35	4.10	<u>Licensed industrial activities (Part A(1))</u>	0	1	0	0	-
36	4.11	<u>Licensed pollutant release (Part A(2)/B)</u>	0	0	1	0	-
36	4.12	Radioactive Substance Authorisations	0	0	0	0	-
36	4.13	<u>Licensed Discharges to controlled waters</u>	1	0	5	17	-
40	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
40	4.15	Pollutant release to public sewer	0	0	0	0	-
40	4.16	List 1 Dangerous Substances	0	0	0	0	-
40	4.17	<u>List 2 Dangerous Substances</u>	0	0	1	1	-
41	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
41	4.19	Pollution inventory substances	0	0	0	0	-
41	4.20	Pollution inventory waste transfers	0	0	0	0	-
41	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
42	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
44	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
45	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
46	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
46	5.5	Groundwater vulnerability- local information	None (within 0m)				
47	5.6	<u>Groundwater abstractions</u>	0	0	0	0	4
49	5.7	<u>Surface water abstractions</u>	0	0	0	0	2
49	5.8	Potable abstractions	0	0	0	0	0
50	5.9	Source Protection Zones	0	0	0	0	-
50	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
51	6.1	<u>Water Network (OS MasterMap)</u>	0	6	31	-	-



54	<u>6.2</u>	<u>Surface water features</u>	0	3	13	-	-
55	<u>6.3</u>	<u>WFD Surface water body catchments</u>	2	-	-	-	-
55	<u>6.4</u>	<u>WFD Surface water bodies</u>	0	1	1	-	-
56	<u>6.5</u>	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
57	<u>7.1</u>	<u>Risk of flooding from rivers and the sea</u>	High (within 50m)				
58	<u>7.2</u>	<u>Historical Flood Events</u>	2	2	10	-	-
59	<u>7.3</u>	<u>Flood Defences</u>	0	1	6	-	-
60	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
60	<u>7.5</u>	<u>Flood Storage Areas</u>	0	1	2	-	-
61	<u>7.6</u>	<u>Flood Zone 2</u>	Identified (within 50m)				
62	<u>7.7</u>	<u>Flood Zone 3</u>	Identified (within 50m)				
Page	Section	Surface water flooding					
63	<u>8.1</u>	<u>Surface water flooding</u>	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding					
65	<u>9.1</u>	<u>Groundwater flooding</u>	Negligible (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
66	<u>10.1</u>	<u>Sites of Special Scientific Interest (SSSI)</u>	0	2	1	1	2
67	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
67	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
67	10.4	Special Protection Areas (SPA)	0	0	0	0	0
68	10.5	National Nature Reserves (NNR)	0	0	0	0	0
68	<u>10.6</u>	<u>Local Nature Reserves (LNR)</u>	0	0	0	0	1
68	<u>10.7</u>	<u>Designated Ancient Woodland</u>	0	0	0	0	6
69	10.8	Biosphere Reserves	0	0	0	0	0
69	10.9	Forest Parks	0	0	0	0	0
69	10.10	Marine Conservation Zones	0	0	0	0	0
69	<u>10.11</u>	<u>Green Belt</u>	1	0	0	0	0
70	10.12	Proposed Ramsar sites	0	0	0	0	0



70	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
70	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
70	10.15	Nitrate Sensitive Areas	0	0	0	0	0
71	10.16	<u>Nitrate Vulnerable Zones</u>	1	0	1	0	0
72	10.17	<u>SSSI Impact Risk Zones</u>	3	-	-	-	-
74	10.18	<u>SSSI Units</u>	0	2	2	1	3
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
78	11.1	World Heritage Sites	0	0	0	-	-
78	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
78	11.3	National Parks	0	0	0	-	-
78	11.4	Listed Buildings	0	0	0	-	-
79	11.5	Conservation Areas	0	0	0	-	-
79	11.6	Scheduled Ancient Monuments	0	0	0	-	-
79	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
80	12.1	<u>Agricultural Land Classification</u>	Grade 4 (within 250m)				
81	12.2	Open Access Land	0	0	0	-	-
81	12.3	Tree Felling Licences	0	0	0	-	-
81	12.4	<u>Environmental Stewardship Schemes</u>	0	1	2	-	-
82	12.5	<u>Countryside Stewardship Schemes</u>	0	1	2	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
83	13.1	<u>Priority Habitat Inventory</u>	1	3	5	-	-
84	13.2	Habitat Networks	0	0	0	-	-
84	13.3	<u>Open Mosaic Habitat</u>	1	0	0	-	-
84	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
86	14.1	<u>10k Availability</u>	Identified (within 500m)				
87	14.2	<u>Artificial and made ground (10k)</u>	3	1	4	2	-
89	14.3	<u>Superficial geology (10k)</u>	1	0	0	2	-



90	14.4	Landslip (10k)	0	0	0	0	-
91	14.5	<u>Bedrock geology (10k)</u>	5	1	1	5	-
92	14.6	<u>Bedrock faults and other linear features (10k)</u>	1	0	4	5	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
94	15.1	<u>50k Availability</u>	Identified (within 500m)				
95	15.2	<u>Artificial and made ground (50k)</u>	1	0	2	0	-
96	15.3	<u>Artificial ground permeability (50k)</u>	1	0	-	-	-
97	15.4	<u>Superficial geology (50k)</u>	1	0	0	2	-
98	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
98	15.6	Landslip (50k)	0	0	0	0	-
98	15.7	Landslip permeability (50k)	None (within 50m)				
99	15.8	<u>Bedrock geology (50k)</u>	4	1	1	1	-
100	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
100	15.10	<u>Bedrock faults and other linear features (50k)</u>	1	0	3	2	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
102	16.1	<u>BGS Boreholes</u>	2	4	23	-	-
Page	Section	Natural ground subsidence					
104	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
105	17.2	<u>Running sands</u>	Low (within 50m)				
107	17.3	<u>Compressible deposits</u>	Moderate (within 50m)				
109	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
110	17.5	<u>Landslides</u>	Low (within 50m)				
112	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
114	18.1	Natural cavities	0	0	0	0	-
115	18.2	<u>BritPits</u>	0	0	4	1	-
116	18.3	<u>Surface ground workings</u>	15	5	26	-	-
118	18.4	<u>Underground workings</u>	1	1	2	2	7
119	18.5	Historical Mineral Planning Areas	0	0	0	0	-



119	18.6	<u>Non-coal mining</u>	1	0	1	1	3
120	18.7	Mining cavities	0	0	0	0	0
120	18.8	JPB mining areas	None (within 0m)				
120	18.9	<u>Coal mining</u>	Identified (within 0m)				
120	18.10	Brine areas	None (within 0m)				
121	18.11	Gypsum areas	None (within 0m)				
121	18.12	Tin mining	None (within 0m)				
121	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
122	19.1	<u>Radon</u>	Between 1% and 3% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
124	20.1	<u>BGS Estimated Background Soil Chemistry</u>	10	3	-	-	-
125	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
125	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
126	21.1	Underground railways (London)	0	0	0	-	-
126	21.2	Underground railways (Non-London)	0	0	0	-	-
127	21.3	Railway tunnels	0	0	0	-	-
127	21.4	<u>Historical railway and tunnel features</u>	17	1	9	-	-
128	21.5	Royal Mail tunnels	0	0	0	-	-
128	21.6	<u>Historical railways</u>	0	2	2	-	-
129	21.7	Railways	0	0	0	-	-
129	21.8	Crossrail 1	0	0	0	0	-
129	21.9	Crossrail 2	0	0	0	0	-
129	21.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 19/04/2021

Site Area: 4.86ha



Recent site history - 2018 aerial photograph



Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2023. All Rights Reserved.

Capture Date: 01/07/2018

Site Area: 4.86ha



Recent site history - 2012 aerial photograph

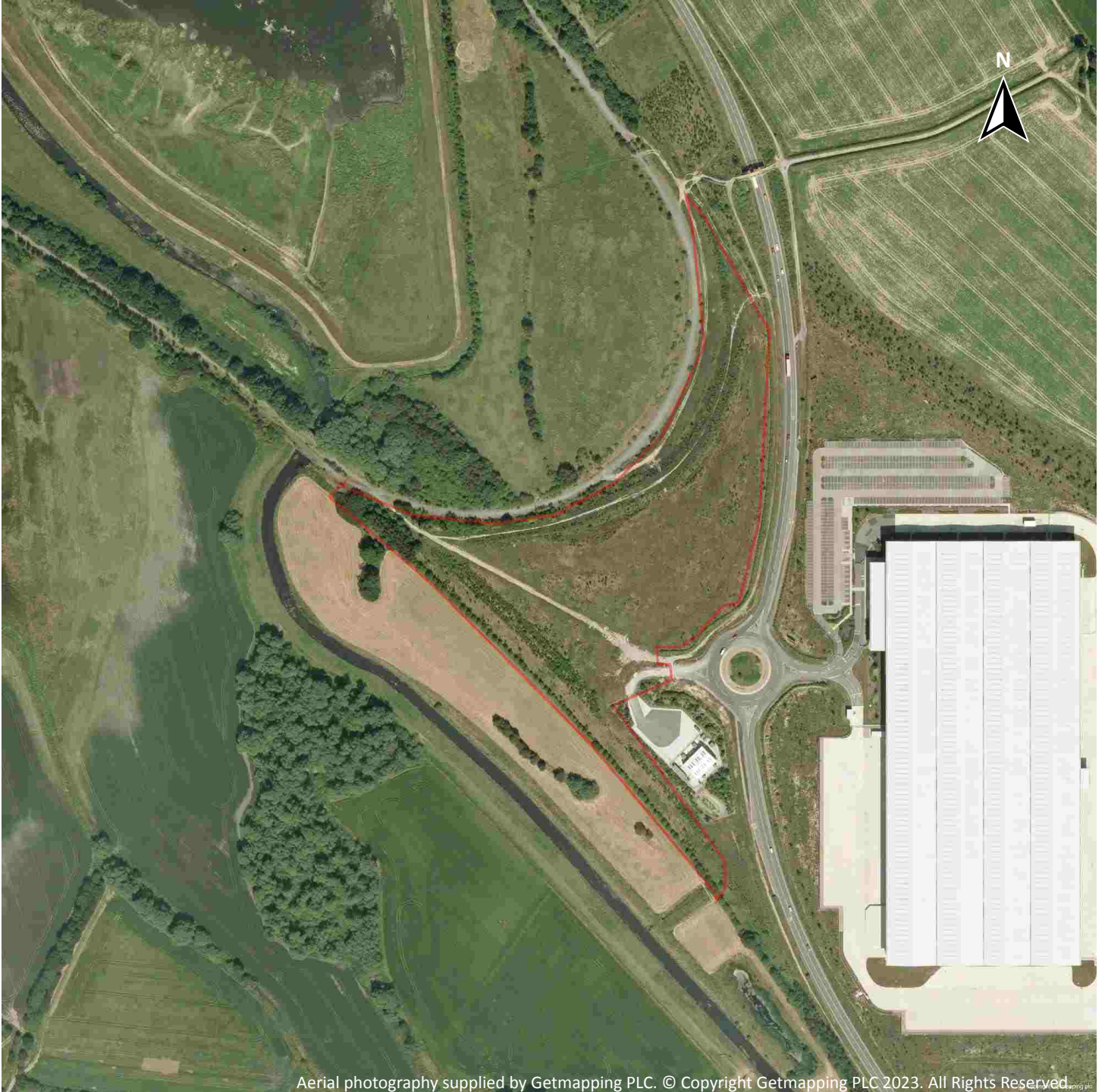


Capture Date: 26/03/2012

Site Area: 4.86ha



Recent site history - 2009 aerial photograph



Capture Date: 02/07/2009

Site Area: 4.86ha



Recent site history - 1999 aerial photograph

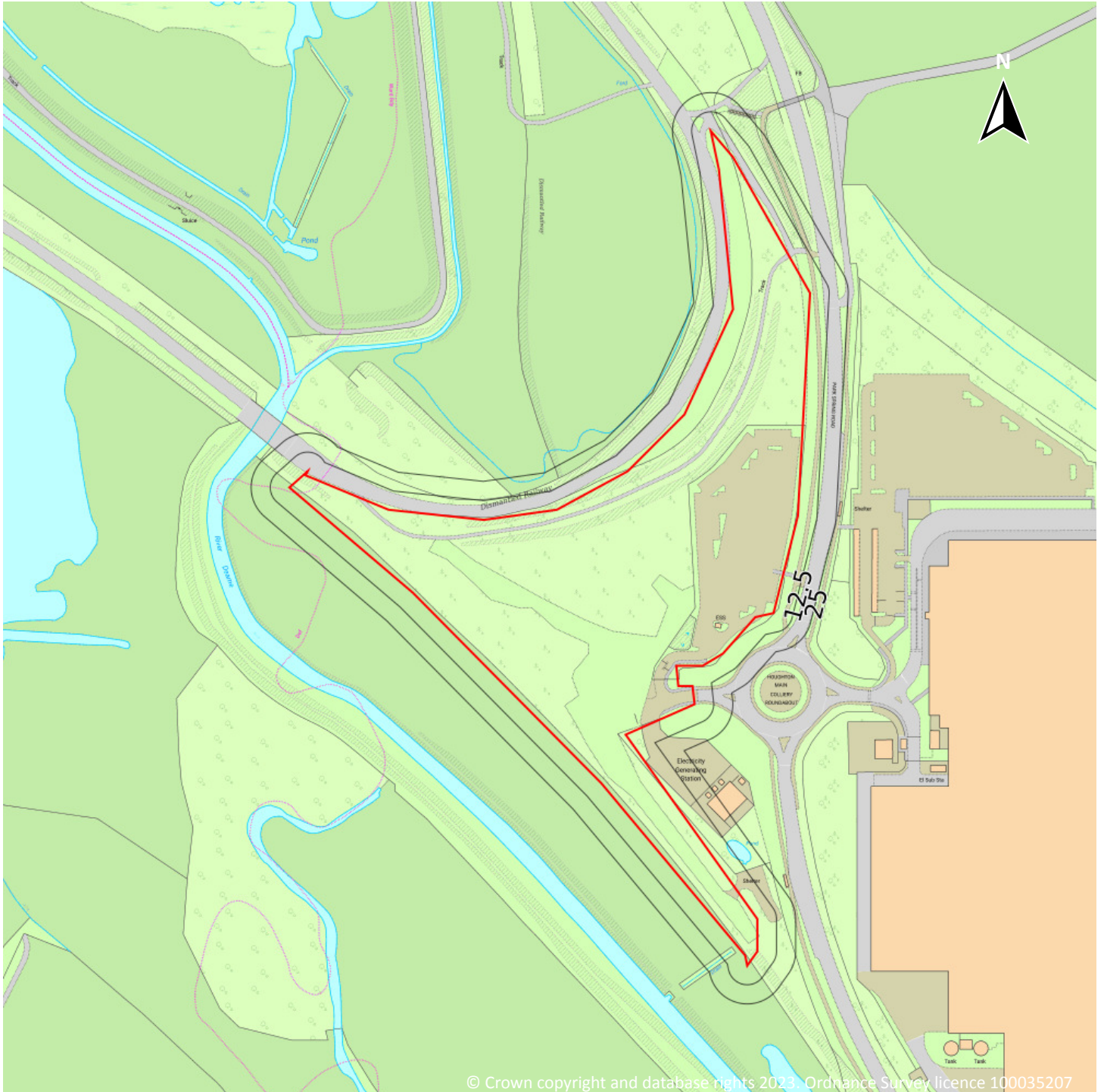


Capture Date: 10/07/1999

Site Area: 4.86ha



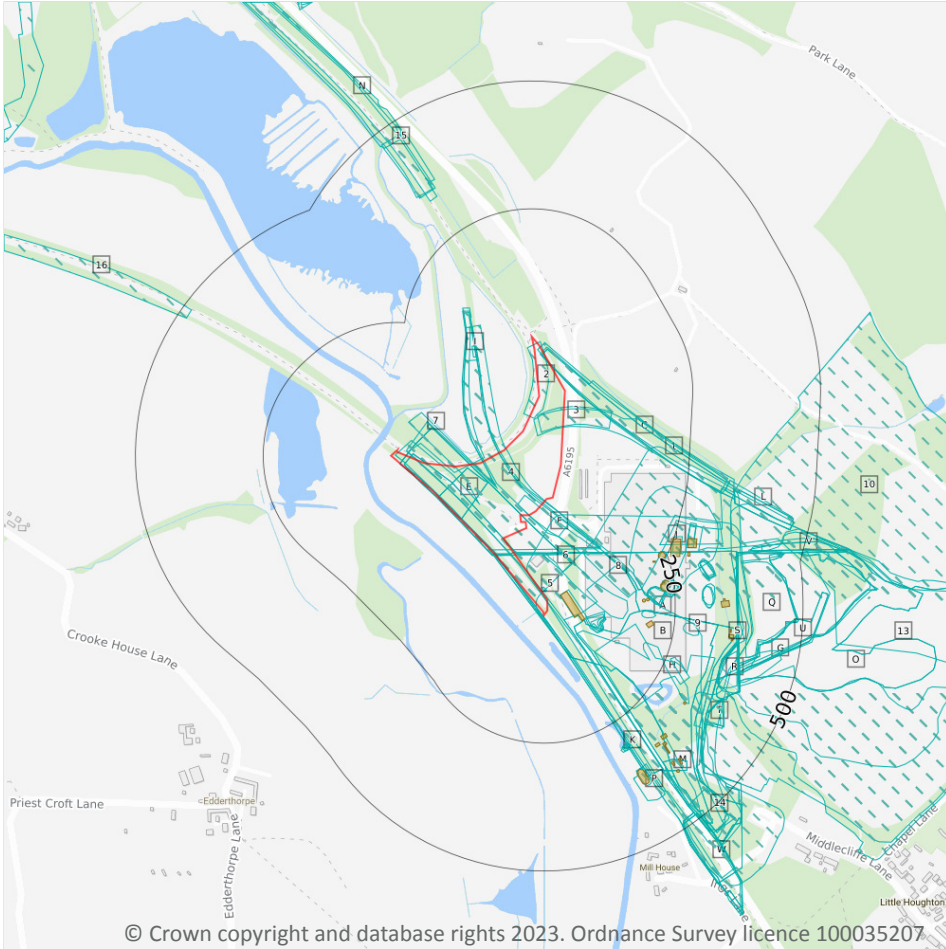
OS MasterMap site plan



Site Area: 4.86ha



1 Past land use



1.1 Historical industrial land uses

Records within 500m

108

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
1	On site	Cuttings	1904 - 1932	1477297

ID	Location	Land use	Dates present	Group ID
2	On site	Cuttings	1988	1490978
3	On site	Cuttings	1988	1503207
4	On site	Mineral Railway Sidings	1948	1519316
A	On site	Unspecified Mine	1967	1455614
A	On site	Mineral Railway Sidings	1955	1527970
B	On site	Colliery	1931 - 1938	1459128
B	On site	Colliery	1948	1473947
B	On site	Colliery	1981 - 1988	1520639
C	On site	Cuttings	1948	1462215
C	On site	Cuttings	1955 - 1967	1466460
C	On site	Cuttings	1938	1497204
C	On site	Cuttings	1981	1551529
D	On site	Railway Sidings	1938 - 1948	1467888
D	On site	Mineral Railway Sidings	1967	1470786
D	On site	Railway Sidings	1931	1519638
D	On site	Railway Sidings	1904	1530087
D	On site	Railway Sidings	1890	1538754
E	On site	Cuttings	1948	1470380
E	On site	Mineral Railway Sidings	1938	1477641
E	On site	Railway Sidings	1904	1491920
E	On site	Cuttings	1904	1515666
F	On site	Cuttings	1904	1504301
5	5m S	Railway Building	1904	1430471
D	26m SE	Unspecified Tanks	1988	1426395
G	37m S	Colliery	1955	1501141
6	44m SE	Cuttings	1938	1488034
D	51m SE	Cuttings	1904	1468913
F	59m SE	Cuttings	1948	1539955



ID	Location	Land use	Dates present	Group ID
H	61m SE	Colliery	1890	1502419
H	61m SE	Colliery	1904	1506114
7	66m NW	Railway Building	1938	1430472
H	73m SE	Railway Sidings	1890	1491941
D	77m SE	Unspecified Pit	1938	1527477
D	78m SE	Unspecified Ground Workings	1955	1527117
D	88m SE	Unspecified Pit	1948	1475518
D	92m SE	Unspecified Ground Workings	1931 - 1938	1521359
8	110m SE	Cuttings	1904	1495455
I	112m N	Railway Sidings	1904	1409637
I	114m N	Railway Building	1904	1430473
B	122m SE	Railway Sidings	1981 - 1988	1532812
J	173m E	Refuse Heap	1967	1438075
A	185m SE	Unspecified Pit	1904	1455299
A	195m SE	Unspecified Pit	1938 - 1948	1547795
A	196m SE	Unspecified Pit	1931 - 1938	1495684
A	197m SE	Unspecified Pit	1955	1471451
A	225m SE	Unspecified Tanks	1988	1426393
A	225m SE	Unspecified Tank	1981	1435095
J	229m SE	Unspecified Commercial/Industrial	1948	1411026
A	231m SE	Cuttings	1938	1549526
A	233m SE	Cuttings	1948 - 1955	1489556
J	234m SE	Unspecified Tanks	1988	1426396
J	234m SE	Unspecified Tank	1981	1435096
A	235m SE	Cuttings	1931 - 1938	1503482
J	248m E	Unspecified Tanks	1988	1426394
9	268m SE	Unspecified Pit	1904	1455300
J	274m E	Railway Sidings	1948	1541877



ID	Location	Land use	Dates present	Group ID
J	274m E	Railway Sidings	1938	1498974
K	298m SE	Pump House	1955	1471624
K	299m SE	Pump House	1948	1464337
K	301m SE	Pump House	1938	1515496
K	302m SE	Pump House	1931 - 1938	1546912
J	303m SE	Cuttings	1938	1493536
J	303m SE	Refuse Heap	1931	1506883
J	304m SE	Refuse Heap	1948 - 1955	1500798
J	304m SE	Refuse Heap	1938	1507066
J	306m SE	Cuttings	1955	1545467
J	307m SE	Cuttings	1931 - 1938	1532751
J	307m SE	Cuttings	1948	1542328
L	326m E	Cuttings	1955	1537155
N	331m N	Railway Sidings	1955 - 1967	1469085
10	340m E	Refuse Heap	1988	1542759
L	343m E	Cuttings	1904	1468816
L	343m E	Cuttings	1948	1534332
O	345m E	Refuse Heap	1967 - 1981	1476544
11	347m N	Railway Sidings	1948	1525301
N	348m N	Railway Sidings	1938	1503554
P	353m SE	Unspecified Works	1981 - 1988	1547874
P	354m SE	Unspecified Tanks	1967 - 1988	1469125
Q	354m SE	Refuse Heap	1938 - 1948	1469881
Q	354m SE	Refuse Heap	1929	1479645
R	355m SE	Refuse Heap	1904	1552188
R	356m SE	Refuse Heap	1938	1480859
R	358m SE	Refuse Heap	1931	1520427
O	361m SE	Refuse Heap	1955	1479532



ID	Location	Land use	Dates present	Group ID
12	369m SE	Refuse Heap	1948 - 1955	1516842
M	370m SE	Railway Sidings	1981	1467376
M	370m SE	Railway Sidings	1988	1552053
T	371m SE	Sewage Works	1904	1512071
T	371m SE	Sewage Works	1931 - 1938	1521947
13	372m SE	Refuse Heaps	1948	1553761
T	374m SE	Sewage Works	1948	1474157
G	385m SE	Refuse Heap	1904	1494142
U	388m SE	Railway Sidings	1929	1459960
U	388m SE	Railway Sidings	1939 - 1948	1462463
V	397m E	Railway Sidings	1948	1516766
V	400m E	Railway Sidings	1932	1520800
V	420m E	Refuse Heap	1932	1492020
14	463m SE	Cuttings	1955 - 1967	1556654
15	463m N	Tunnel	1981 - 1988	1499346
16	482m NW	Cuttings	1890	1486871
W	484m SE	Cuttings	1904	1510077
W	484m SE	Cuttings	1938 - 1948	1528252
W	484m SE	Cuttings	1890	1528600
W	489m SE	Cuttings	1931	1544302
W	489m SE	Cuttings	1938	1468570
W	490m SE	Cuttings	1955 - 1967	1474582
V	497m E	Refuse Heap	1939	1533818

This data is sourced from Ordnance Survey / Groundsure.



1.2 Historical tanks

Records within 500m

21

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
D	27m SE	Tanks	1983	232632
A	186m SE	Unspecified Tank	1931	228788
A	194m SE	Unspecified Tank	1961	228789
A	195m SE	Unspecified Tank	1983	228787
J	219m SE	Unspecified Tank	1983	228790
A	223m SE	Unspecified Tank	1983	228786
J	233m SE	Unspecified Tank	1980 - 1983	247095
J	246m E	Unspecified Tank	1983	228783
J	277m E	Unspecified Tank	1983	228785
J	285m E	Unspecified Tank	1983	228784
H	322m SE	Unspecified Tank	1906	229106
M	329m SE	Unspecified Tank	1964	228950
M	334m SE	Tanks	1931	232631
J	340m SE	Tanks	1931	232633
M	342m SE	Tanks	1931	232630
P	355m SE	Tanks	1961 - 1964	247192
S	358m SE	Tanks	1931	232635
S	360m SE	Tanks	1931	232634
M	380m SE	Tanks	1961 - 1964	243061
M	384m SE	Tanks	1964	232629
M	399m SE	Unspecified Tank	1961 - 1964	247390



This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

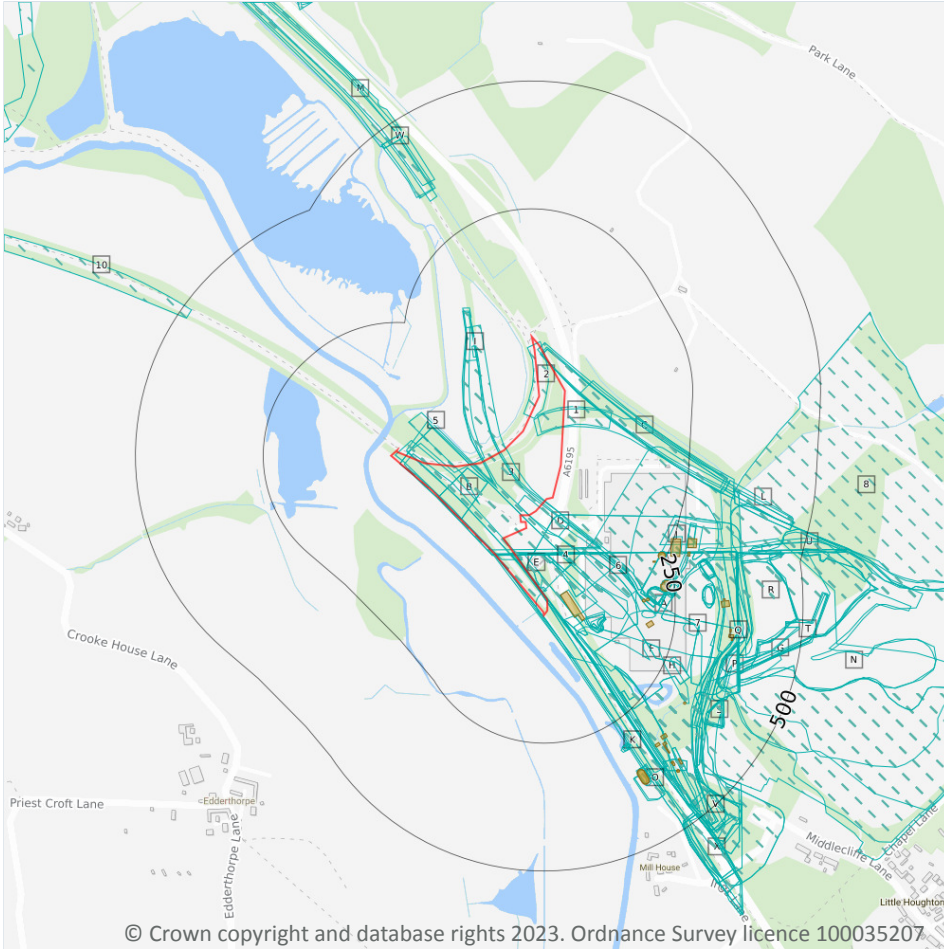
0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



2.1 Historical industrial land uses

Records within 500m

151

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 21**

ID	Location	Land Use	Date	Group ID
1	On site	Cuttings	1988	1503207
2	On site	Cuttings	1988	1490978
3	On site	Mineral Railway Sidings	1948	1519316

ID	Location	Land Use	Date	Group ID
A	On site	Colliery	1988	1520639
A	On site	Colliery	1981	1520639
A	On site	Unspecified Mine	1967	1455614
A	On site	Colliery	1938	1459128
A	On site	Railway Sidings	1938	1467888
A	On site	Colliery	1931	1459128
A	On site	Railway Sidings	1931	1519638
A	On site	Railway Sidings	1948	1467888
A	On site	Colliery	1948	1473947
A	On site	Railway Sidings	1904	1530087
A	On site	Mineral Railway Sidings	1955	1527970
A	On site	Railway Sidings	1938	1467888
B	On site	Cuttings	1948	1470380
B	On site	Cuttings	1904	1515666
B	On site	Railway Sidings	1948	1467888
B	On site	Railway Sidings	1904	1491920
B	On site	Railway Sidings	1890	1538754
B	On site	Mineral Railway Sidings	1938	1477641
C	On site	Cuttings	1948	1462215
C	On site	Cuttings	1904	1477297
C	On site	Cuttings	1981	1551529
C	On site	Cuttings	1955	1466460
C	On site	Cuttings	1938	1497204
D	On site	Cuttings	1904	1504301
E	On site	Railway Sidings	1890	1538754
F	On site	Mineral Railway Sidings	1967	1470786
A	0m S	Colliery	1938	1459128
A	0m S	Colliery	1938	1459128



ID	Location	Land Use	Date	Group ID
E	5m S	Railway Building	1904	1430471
F	26m SE	Unspecified Tanks	1988	1426395
C	30m NE	Cuttings	1967	1466460
G	37m S	Colliery	1955	1501141
4	44m SE	Cuttings	1938	1488034
F	51m SE	Cuttings	1904	1468913
D	59m SE	Cuttings	1948	1539955
H	61m SE	Colliery	1904	1506114
5	66m NW	Railway Building	1938	1430472
H	73m SE	Colliery	1890	1502419
H	73m SE	Railway Sidings	1890	1491941
F	77m SE	Unspecified Pit	1938	1527477
F	77m SE	Unspecified Pit	1938	1527477
F	78m SE	Unspecified Ground Workings	1955	1527117
F	88m SE	Unspecified Pit	1948	1475518
F	92m SE	Unspecified Ground Workings	1938	1521359
F	92m SE	Unspecified Ground Workings	1931	1521359
6	110m SE	Cuttings	1904	1495455
I	112m N	Railway Sidings	1904	1409637
I	114m N	Railway Building	1904	1430473
A	122m SE	Railway Sidings	1988	1532812
A	122m SE	Railway Sidings	1981	1532812
J	173m E	Refuse Heap	1967	1438075
A	185m SE	Unspecified Pit	1904	1455299
A	195m SE	Unspecified Pit	1938	1547795
A	195m SE	Unspecified Pit	1938	1547795
A	196m SE	Unspecified Pit	1938	1495684
A	196m SE	Unspecified Pit	1931	1495684



ID	Location	Land Use	Date	Group ID
A	197m SE	Unspecified Pit	1948	1547795
A	197m SE	Unspecified Pit	1955	1471451
A	225m SE	Unspecified Tanks	1988	1426393
A	225m SE	Unspecified Tank	1981	1435095
J	229m SE	Unspecified Commercial/Industrial	1948	1411026
A	231m SE	Cuttings	1938	1549526
A	233m SE	Cuttings	1955	1489556
A	234m SE	Cuttings	1948	1489556
J	234m SE	Unspecified Tanks	1988	1426396
J	234m SE	Unspecified Tank	1981	1435096
A	235m SE	Cuttings	1938	1503482
A	235m SE	Cuttings	1931	1503482
J	248m E	Unspecified Tanks	1988	1426394
7	268m SE	Unspecified Pit	1904	1455300
J	274m E	Railway Sidings	1948	1541877
J	274m E	Railway Sidings	1938	1498974
K	298m SE	Pump House	1955	1471624
K	299m SE	Pump House	1948	1464337
K	301m SE	Pump House	1938	1515496
K	302m SE	Pump House	1938	1546912
K	302m SE	Pump House	1931	1546912
J	303m SE	Cuttings	1938	1493536
J	303m SE	Refuse Heap	1931	1506883
J	304m SE	Refuse Heap	1948	1500798
J	304m SE	Refuse Heap	1938	1507066
J	304m SE	Refuse Heap	1938	1507066
J	306m SE	Cuttings	1955	1545467
J	307m SE	Cuttings	1938	1532751



ID	Location	Land Use	Date	Group ID
J	307m SE	Cuttings	1931	1532751
J	307m SE	Cuttings	1948	1542328
J	309m SE	Refuse Heap	1955	1500798
L	326m E	Cuttings	1955	1537155
M	331m N	Railway Sidings	1955	1469085
8	340m E	Refuse Heap	1988	1542759
L	343m E	Cuttings	1948	1534332
L	343m E	Cuttings	1904	1468816
N	345m E	Refuse Heap	1981	1476544
N	346m E	Refuse Heap	1967	1476544
9	347m N	Railway Sidings	1948	1525301
M	348m N	Railway Sidings	1938	1503554
L	351m E	Cuttings	1932	1477297
O	353m SE	Unspecified Works	1988	1547874
O	354m SE	Unspecified Tanks	1988	1469125
O	354m SE	Unspecified Tanks	1967	1469125
O	354m SE	Unspecified Works	1981	1547874
P	354m SE	Refuse Heap	1948	1469881
P	355m SE	Refuse Heap	1904	1552188
P	356m SE	Refuse Heap	1938	1480859
P	356m SE	Refuse Heap	1938	1480859
O	358m SE	Unspecified Tanks	1981	1469125
P	358m SE	Refuse Heap	1938	1469881
P	358m SE	Refuse Heap	1931	1520427
N	361m SE	Refuse Heap	1955	1479532
M	361m N	Railway Sidings	1967	1469085
R	369m SE	Refuse Heap	1955	1516842
H	370m SE	Railway Sidings	1988	1552053



ID	Location	Land Use	Date	Group ID
H	370m SE	Railway Sidings	1981	1467376
R	370m SE	Refuse Heap	1939	1469881
S	371m SE	Sewage Works	1904	1512071
S	371m SE	Sewage Works	1938	1521947
S	371m SE	Sewage Works	1938	1521947
N	372m SE	Refuse Heaps	1948	1553761
N	372m SE	Refuse Heaps	1948	1553761
S	374m SE	Sewage Works	1948	1474157
S	374m SE	Sewage Works	1938	1521947
S	374m SE	Sewage Works	1931	1521947
R	375m SE	Refuse Heap	1929	1479645
G	385m SE	Refuse Heap	1904	1494142
T	388m SE	Railway Sidings	1948	1462463
T	389m SE	Railway Sidings	1939	1462463
T	390m SE	Railway Sidings	1929	1459960
N	393m SE	Refuse Heap	1939	1469881
N	395m SE	Refuse Heap	1929	1479645
U	397m E	Railway Sidings	1948	1516766
U	400m E	Railway Sidings	1932	1520800
U	420m E	Refuse Heap	1932	1492020
U	420m E	Refuse Heap	1932	1492020
U	430m E	Refuse Heap	1948	1516842
V	463m SE	Cuttings	1955	1556654
W	463m N	Tunnel	1988	1499346
W	463m N	Tunnel	1981	1499346
V	471m SE	Cuttings	1967	1556654
10	482m NW	Cuttings	1890	1486871
X	484m SE	Cuttings	1948	1528252



ID	Location	Land Use	Date	Group ID
X	484m SE	Cuttings	1904	1510077
X	489m SE	Cuttings	1938	1468570
X	489m SE	Cuttings	1931	1544302
X	489m SE	Cuttings	1938	1528252
X	490m SE	Cuttings	1967	1474582
X	490m SE	Cuttings	1955	1474582
X	494m SE	Cuttings	1890	1528600
U	497m E	Refuse Heap	1939	1533818

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

25

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 21**

ID	Location	Land Use	Date	Group ID
F	27m SE	Tanks	1983	232632
A	186m SE	Unspecified Tank	1931	228788
A	194m SE	Unspecified Tank	1961	228789
A	195m SE	Unspecified Tank	1983	228787
J	219m SE	Unspecified Tank	1983	228790
A	223m SE	Unspecified Tank	1983	228786
J	233m SE	Unspecified Tank	1980	247095
J	233m SE	Unspecified Tank	1983	247095
J	246m E	Unspecified Tank	1983	228783
J	277m E	Unspecified Tank	1983	228785
J	285m E	Unspecified Tank	1983	228784
H	322m SE	Unspecified Tank	1906	229106



ID	Location	Land Use	Date	Group ID
H	329m SE	Unspecified Tank	1964	228950
H	334m SE	Tanks	1931	232631
J	340m SE	Tanks	1931	232633
H	342m SE	Tanks	1931	232630
O	355m SE	Tanks	1964	247192
O	355m SE	Tanks	1961	247192
Q	358m SE	Tanks	1931	232635
Q	360m SE	Tanks	1931	232634
H	380m SE	Tanks	1964	243061
H	380m SE	Tanks	1961	243061
H	384m SE	Tanks	1964	232629
H	399m SE	Unspecified Tank	1964	247390
H	400m SE	Unspecified Tank	1961	247390

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.



2.5 Historical garages

Records within 500m

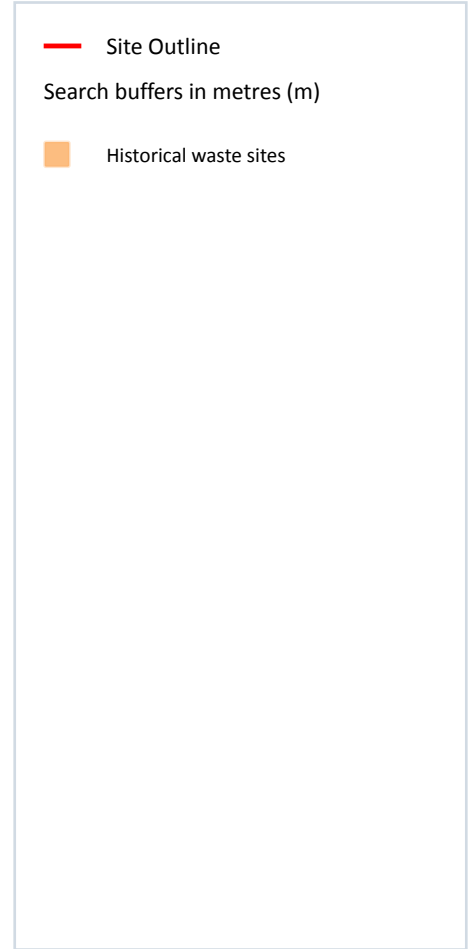
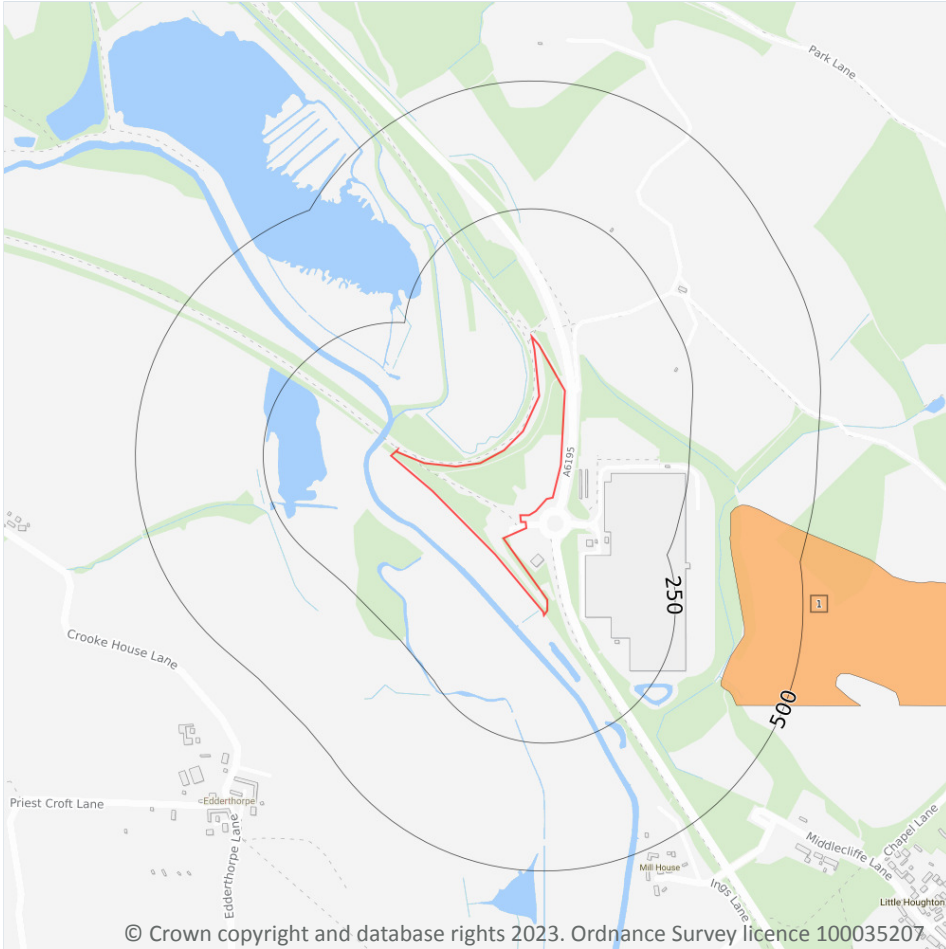
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Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m

0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m

0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m

1

Waste site records derived from Local Authority planning records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 30**

ID	Location	Address	Further Details	Date
1	344m E	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1961

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m

0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m

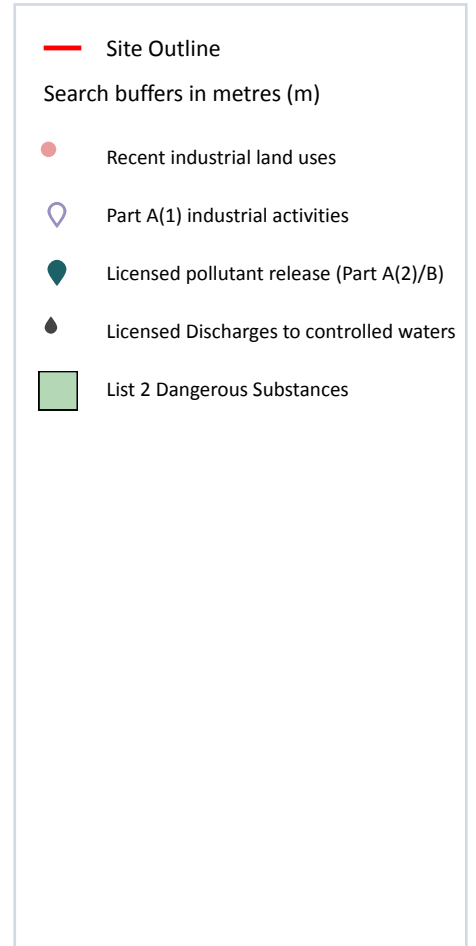
0

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



4.1 Recent industrial land uses

Records within 250m

4

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 33**

ID	Location	Company	Address	Activity	Category
A	On site	Electricity Sub Station	South Yorkshire, S71	Electrical Features	Infrastructure and Facilities
B	21m S	Electricity Generating Station	South Yorkshire, S71	Energy Production	Industrial Features

ID	Location	Company	Address	Activity	Category
1	148m SE	Electricity Sub Station	South Yorkshire, S72	Electrical Features	Infrastructure and Facilities
3	206m NE	Park Spring Turbine	South Yorkshire, S72	Energy Production	Industrial Features

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m **0**

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m **0**

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m **0**

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m **0**

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m

0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

1

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 33**

ID	Location	Details	
B	24m S	Operator: REGENT PARK ENERGY LIMITED Installation Name: HOUGHTON ENERGY PARK Process: NEW MEDIUM COMBUSTION PLANT Permit Number: MP3603MQ Original Permit Number: MP3603MQ	EPR Reference: - Issue Date: 04/12/2021 Effective Date: 04/12/2021 Last date noted as effective: 01/12/2022 Status: EFFECTIVE

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	1
----------------------------	----------

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 33**

ID	Location	Address	Details	
2	187m SE	Rjb Mining Houghton Main Occs, Little Houghton, Barnsley, S72 0HY	Process: Coal & Coke Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0
----------------------------	----------

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	23
----------------------------	-----------

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 33**

ID	Location	Address	Details	
A	On site	HOUGHTON MAIN, SANDHILL, BARNSELY, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: 3712 Permit Version: 1 Receiving Water: -	Status: REVOKED - UNSPECIFIED Issue date: 12/09/1983 Effective Date: 12/09/1983 Revocation Date: 21/11/1994
C	71m SW	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT Permit Number: WRA7231 Permit Version: 1 Receiving Water: RIVER DEARNE	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 23/10/1996 Effective Date: 23/10/1996 Revocation Date: 07/05/1997
C	71m SW	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT Permit Number: WRA7231 Permit Version: 1 Receiving Water: RIVER DEARNE	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 23/10/1996 Effective Date: 23/10/1996 Revocation Date: 07/05/1997
C	71m SW	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT Permit Number: WRA7231 Permit Version: 2 Receiving Water: RIVER DEARNE	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 08/05/1997 Effective Date: 08/05/1997 Revocation Date: 11/06/2002
C	71m SW	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT Permit Number: WRA7231 Permit Version: 2 Receiving Water: RIVER DEARNE	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 08/05/1997 Effective Date: 08/05/1997 Revocation Date: 11/06/2002
4	245m SE	NCB,HOUGHTON MAIN COLLIERY, SURFACE, DRAINAGE INTERCEPTOR	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: 3505 Permit Version: 1 Receiving Water: -	Status: REVOKED - UNSPECIFIED Issue date: 12/09/1983 Effective Date: 12/09/1983 Revocation Date: 15/02/1991
5	374m SE	NCB,HOUGHTON MAIN COLLIERY, SURFACE, DRAINAGE INTERCEPTOR	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: 3505 Permit Version: 1 Receiving Water: -	Status: REVOKED - UNSPECIFIED Issue date: 12/09/1983 Effective Date: 12/09/1983 Revocation Date: 15/02/1991
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSELY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY Permit Number: E284 Permit Version: 1 Receiving Water: RIVER DEARNE	Status: TRANSFERRED FROM R(PP)A 1951-1961 Issue date: 08/11/1973 Effective Date: 08/11/1973 Revocation Date: 31/05/1981



ID	Location	Address	Details	
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSLEY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY Permit Number: E284 Permit Version: 1 Receiving Water: RIVER DEARNE	Status: TRANSFERRED FROM R(PP)A 1951-1961 Issue date: 08/11/1973 Effective Date: 08/11/1973 Revocation Date: 31/05/1981
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSLEY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY Permit Number: E284 Permit Version: 2 Receiving Water: RIVER DEARNE	Status: TRANSFERRED FROM 1978 ORDER Issue date: 01/06/1981 Effective Date: 01/06/1981 Revocation Date: 11/07/1985
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSLEY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY Permit Number: E284 Permit Version: 2 Receiving Water: RIVER DEARNE	Status: TRANSFERRED FROM 1978 ORDER Issue date: 01/06/1981 Effective Date: 01/06/1981 Revocation Date: 11/07/1985
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSLEY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY Permit Number: E284 Permit Version: 3 Receiving Water: RIVER DEARNE	Status: TRANSFERRED FROM COPA 1974 Issue date: 12/07/1985 Effective Date: 12/07/1985 Revocation Date: 18/08/1997
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSLEY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY Permit Number: E284 Permit Version: 3 Receiving Water: RIVER DEARNE	Status: TRANSFERRED FROM COPA 1974 Issue date: 12/07/1985 Effective Date: 12/07/1985 Revocation Date: 18/08/1997
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSLEY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY Permit Number: E284 Permit Version: 4 Receiving Water: RIVER DEARNE	Status: VARIED BY APPLICATION - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 19/08/1997 Effective Date: 19/08/1997 Revocation Date: 30/12/2005
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSLEY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY Permit Number: E284 Permit Version: 4 Receiving Water: RIVER DEARNE	Status: VARIED BY APPLICATION - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 19/08/1997 Effective Date: 19/08/1997 Revocation Date: 30/12/2005



ID	Location	Address	Details	
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSELY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY Permit Number: E284 Permit Version: 5 Receiving Water: RIVER DEARNE	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/03/2005 Effective Date: 31/12/2005 Revocation Date: 27/06/2008
D	413m S	LITTLE HOUGHTON STW, LITTLE HOUGHTON, BARNSELY, SOUTH YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY Permit Number: E284 Permit Version: 5 Receiving Water: RIVER DEARNE	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 11/03/2005 Effective Date: 31/12/2005 Revocation Date: 27/06/2008
E	435m SE	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT) Permit Number: WRA7231 Permit Version: 1 Receiving Water: RIVER DEARNE	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 23/10/1996 Effective Date: 23/10/1996 Revocation Date: 07/05/1997
E	435m SE	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT) Permit Number: WRA7231 Permit Version: 1 Receiving Water: RIVER DEARNE	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 23/10/1996 Effective Date: 23/10/1996 Revocation Date: 07/05/1997
E	435m SE	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT) Permit Number: WRA7231 Permit Version: 2 Receiving Water: RIVER DEARNE	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 08/05/1997 Effective Date: 08/05/1997 Revocation Date: 11/06/2002
E	435m SE	HOUGHTON MAIN OCCS, CONSENT WRA7231, SOUTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT) Permit Number: WRA7231 Permit Version: 2 Receiving Water: RIVER DEARNE	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 08/05/1997 Effective Date: 08/05/1997 Revocation Date: 11/06/2002
E	463m SE	HOUGHTON MAIN COLLIERY, NCB MW (CEA, SED)	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: E 878 Permit Version: 1 Receiving Water: NO DETAILS	Status: CONSENT REVOKED - DISCHARGE CEASED (WRA 91, SCHED 10 & 6) Issue date: 13/06/1983 Effective Date: 13/06/1983 Revocation Date: 13/08/1992



ID	Location	Address	Details	
6	486m N	BARNSELY METROPOLITAN BOROUGH COUNC, IL NEW PARK SPRINGS COLLIERY TI, P GRIMETHORPE NR. BARNSELY SO, UTH YORKSHIRE	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: C4539 Permit Version: 1 Receiving Water: -	Status: REVOKED - UNSPECIFIED Issue date: 18/02/1987 Effective Date: 18/02/1987 Revocation Date: 25/05/1993

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0
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Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0
----------------------------	----------

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0
----------------------------	----------

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	2
----------------------------	----------

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 33**

ID	Location	Name	Status	Receiving Water	Authorised Substances
C	71m SW	Rjb Mining Ltd - Outlet D2 - Sw	Not Active	River Dearne	Iron

ID	Location	Name	Status	Receiving Water	Authorised Substances
E	436m SE	Rjb Mining Ltd, Houghton Outlet D1	Not Active	River Dearne	Iron

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m

0

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m

0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m

0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m

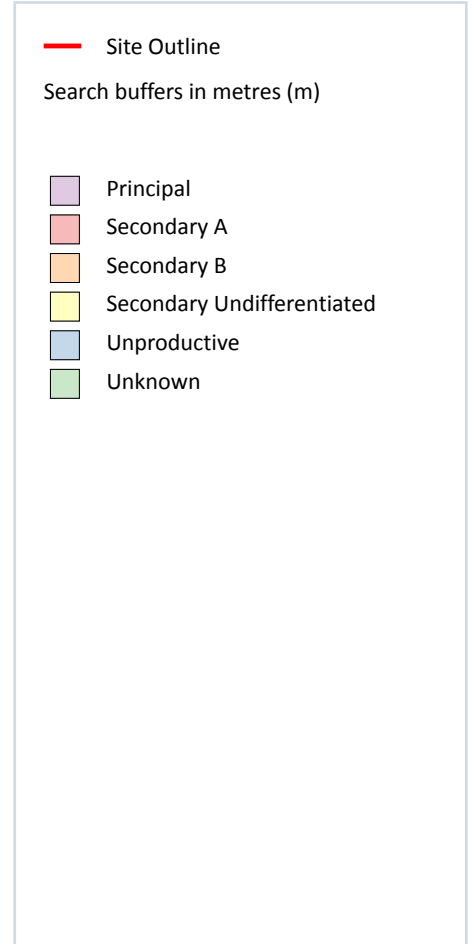
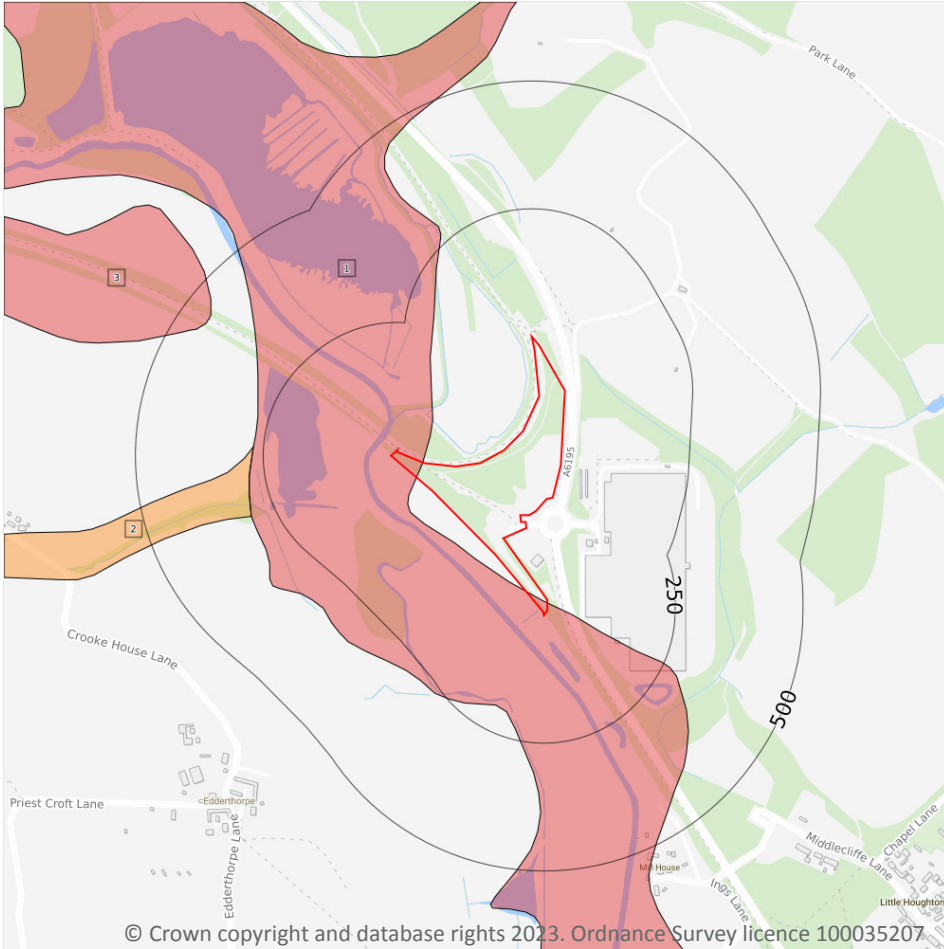
0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



5 Hydrogeology - Superficial aquifer



5.1 Superficial aquifer

Records within 500m

3

Aquifer status of groundwater held within superficial geology.

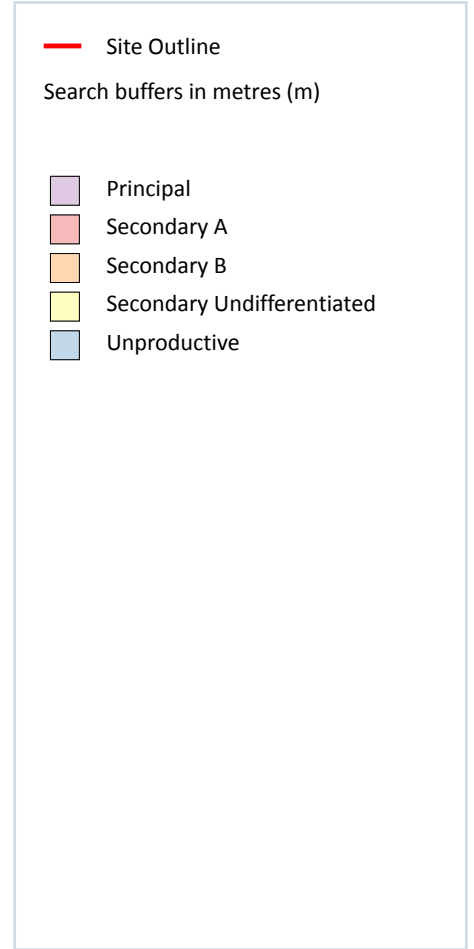
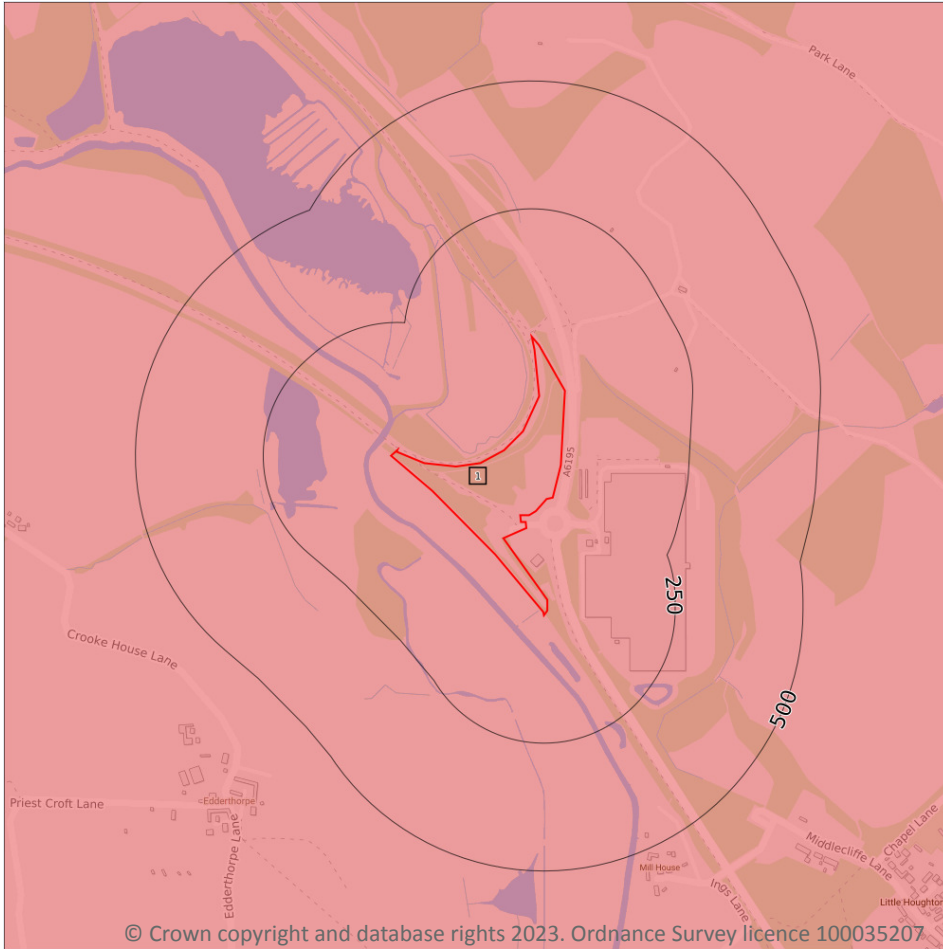
Features are displayed on the Hydrogeology map on **page 42**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	270m W	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

ID	Location	Designation	Description
3	445m NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



5.2 Bedrock aquifer

Records within 500m

1

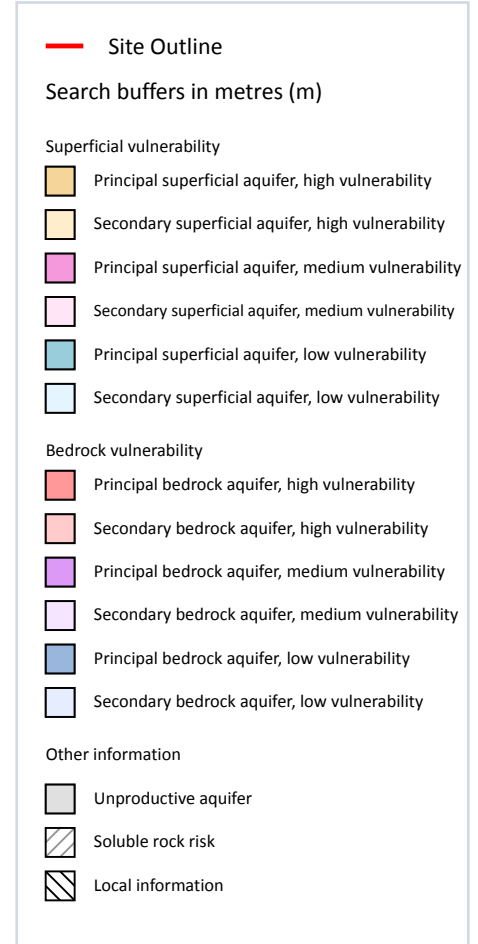
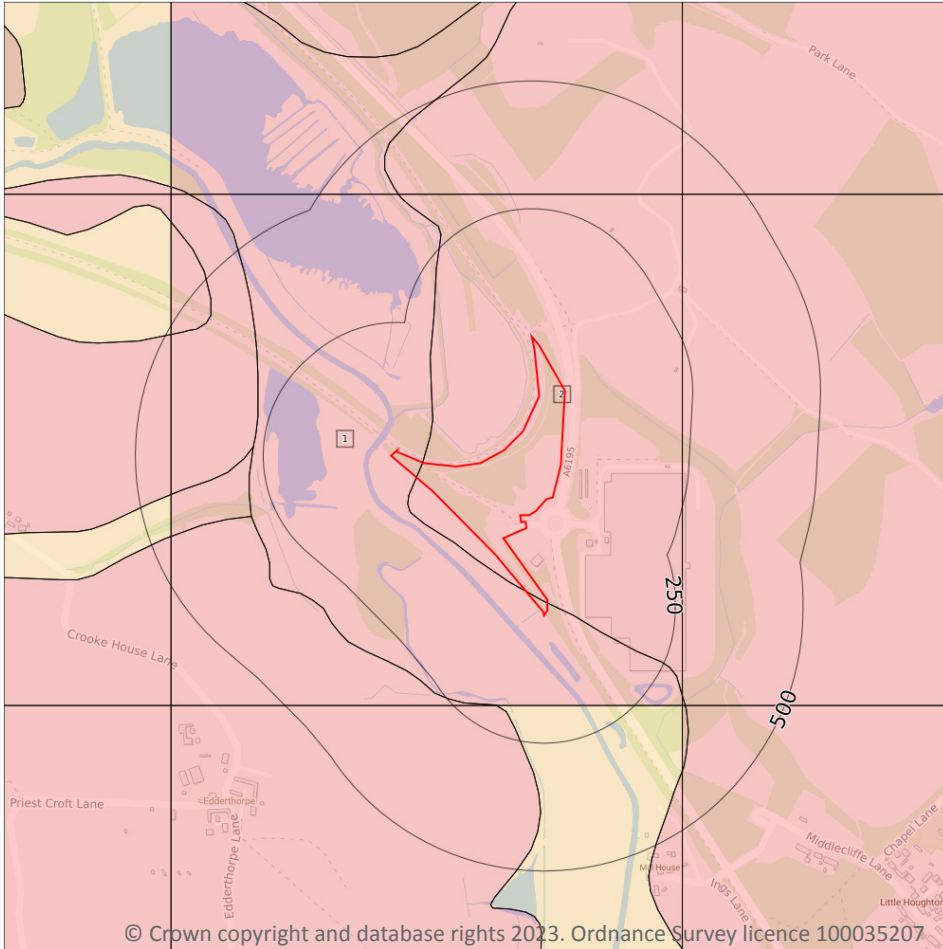
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 44**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

2

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 45**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: High	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: High	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

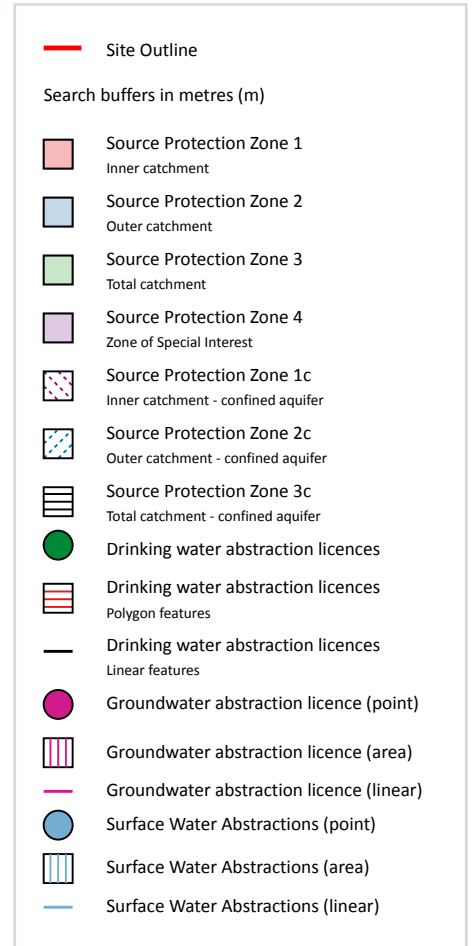
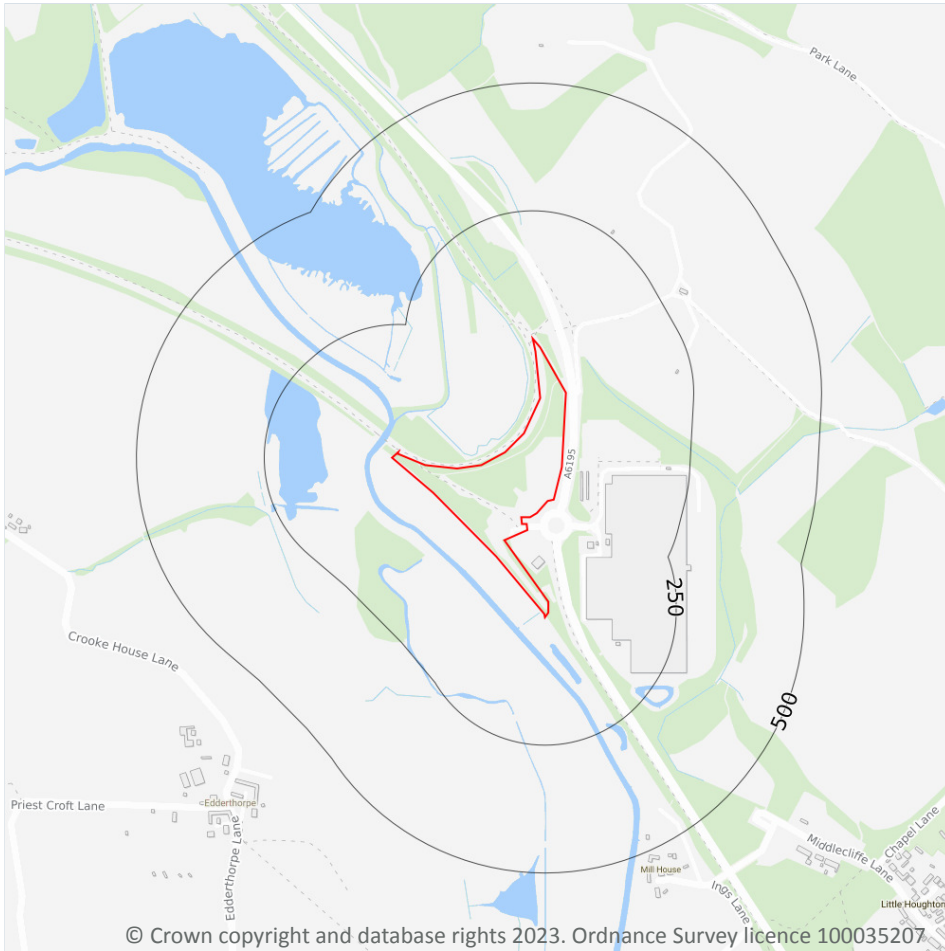
Records on site

0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



5.6 Groundwater abstractions

Records within 2000m

4

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 47**

ID	Location	Details	
-	1282m N	Status: Historical Licence No: 2/27/08/137 Details: Mineral Washing Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - GRIMETHORPE COLLIERY Data Type: Point Name: Carlton Main Brickworks Ltd Easting: 441600 Northing: 408000	Annual Volume (m ³): 430000 Max Daily Volume (m ³): 1600 Original Application No: - Original Start Date: 25/05/2005 Expiry Date: 31/03/2017 Issue No: 3 Version Start Date: 23/11/2009 Version End Date: -
-	1282m N	Status: Active Licence No: 2/27/08/137/R01 Details: Process Water Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - GRIMETHORPE COLLIERY Data Type: Point Name: Michelmersh Brick UK Ltd Easting: 441600 Northing: 408000	Annual Volume (m ³): 15,000 Max Daily Volume (m ³): 50 Original Application No: NPS/WR/027750 Original Start Date: 01/04/2017 Expiry Date: 31/03/2029 Issue No: 2 Version Start Date: 01/04/2019 Version End Date: -
-	1846m W	Status: Historical Licence No: NE/027/0008/011 Details: Heat Pump Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - TYERS HALL - BARNSELY Data Type: Point Name: J & E Dickinson Easting: 439584 Northing: 406499	Annual Volume (m ³): 30000 Max Daily Volume (m ³): 100 Original Application No: - Original Start Date: 19/12/2012 Expiry Date: 31/03/2029 Issue No: 1 Version Start Date: 19/12/2012 Version End Date: -
-	1846m W	Status: Historical Licence No: NE/027/0008/011 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - TYERS HALL - BARNSELY Data Type: Point Name: J & E Dickinson Easting: 439584 Northing: 406499	Annual Volume (m ³): 30000 Max Daily Volume (m ³): 100 Original Application No: - Original Start Date: 19/12/2012 Expiry Date: 31/03/2029 Issue No: 1 Version Start Date: 19/12/2012 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.



5.7 Surface water abstractions

Records within 2000m

2

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 47**

ID	Location	Details	
-	1752m W	Status: Active Licence No: 2/27/08/090 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: RIVER DEARNE Data Type: Point Name: J & E DICKINSON Easting: 439770 Northing: 407050	Annual Volume (m ³): 144,000 Max Daily Volume (m ³): 3,408 Original Application No: 5519 Original Start Date: 25/07/1977 Expiry Date: - Issue No: 101 Version Start Date: 01/11/2006 Version End Date: -
-	1752m W	Status: Active Licence No: 2/27/08/090 Details: Spray Irrigation - Storage Direct Source: SURFACE WATER Point: RIVER DEARNE Data Type: Point Name: J & E DICKINSON Easting: 439770 Northing: 407050	Annual Volume (m ³): 144,000 Max Daily Volume (m ³): 3,408 Original Application No: 5519 Original Start Date: 25/07/1977 Expiry Date: - Issue No: 101 Version Start Date: 01/11/2006 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m

0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.



5.9 Source Protection Zones

Records within 500m

0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

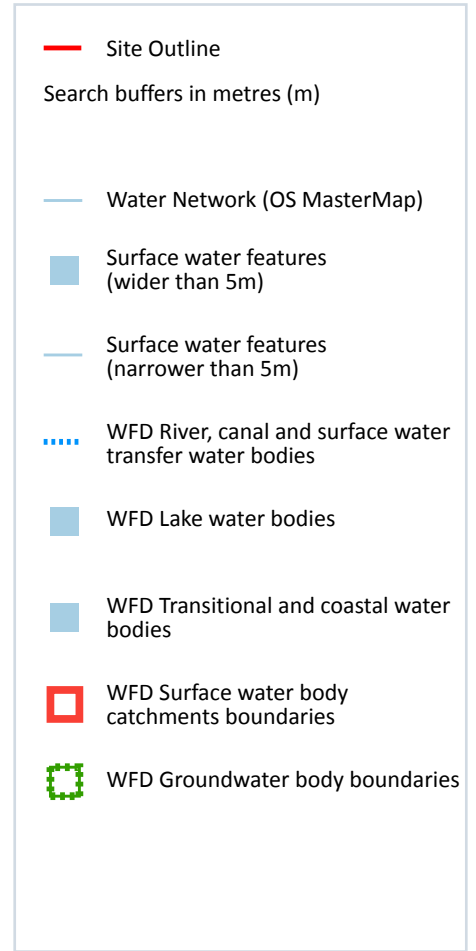
Records within 500m

0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



6.1 Water Network (OS MasterMap)

Records within 250m

37

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 51**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	5m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

ID	Location	Type of water feature	Ground level	Permanence	Name
4	19m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
6	20m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
7	22m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
10	36m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Dearne
A	43m S	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
A	53m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
13	59m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Dearne
14	60m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	60m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Dearne
C	67m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
16	106m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
17	110m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
18	128m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	River Dearne



ID	Location	Type of water feature	Ground level	Permanence	Name
B	128m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	131m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
D	135m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	142m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	143m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	146m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	146m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	150m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
B	152m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	154m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
B	156m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	157m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	157m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
21	164m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	164m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	165m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
B	166m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	176m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	177m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
22	179m W	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
23	180m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	181m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	224m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

16

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 51**



This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	2
------------------------	----------

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 51**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River	Dearne from Lundwood to River Dove	GB104027063172	Dearne	Don and Rother
2	On site	River	Grimethorpe Dike from Source to River Dearne	GB104027063180	Dearne	Don and Rother

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	2
---------------------------	----------

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 51**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
9	31m W	River	Dearne from Lundwood to River Dove	GB104027063172	Moderate	Fail	Moderate	2019
12	58m NW	River	Grimethorpe Dike from Source to River Dearne	GB104027063180	Moderate	Fail	Moderate	2019

This data is sourced from the Environment Agency and Natural Resources Wales.



6.5 WFD Groundwater bodies

Records on site	1
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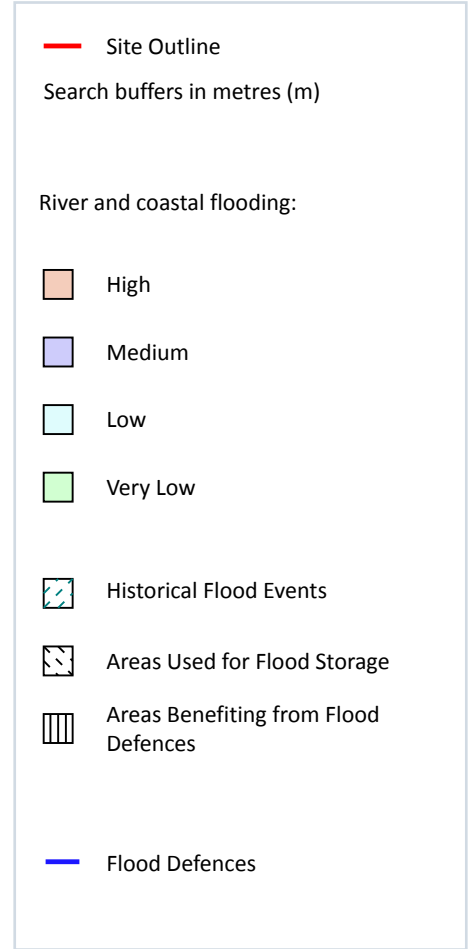
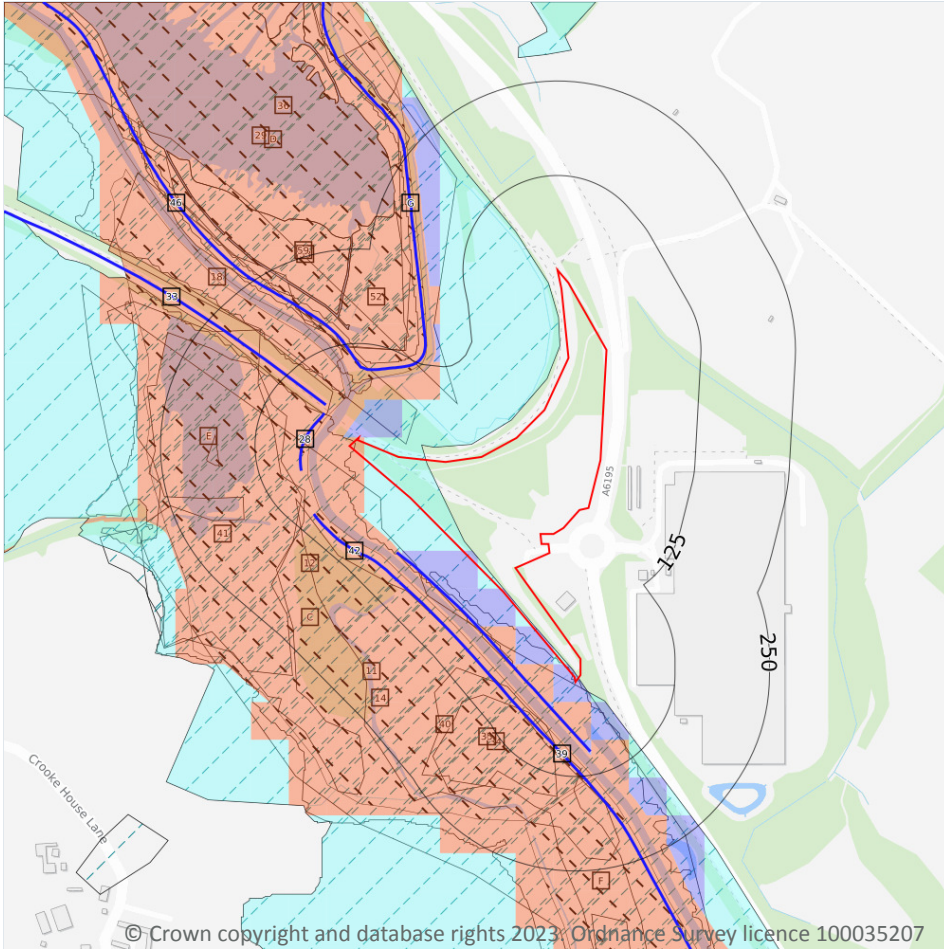
Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 51**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
3	On site	Don & Rother Millstone grit & Coal Measures	<u>GB40402G992300</u>	Poor	Poor	Good	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding



7.1 Risk of flooding from rivers and the sea

Records within 50m

23

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on **page 57**

Distance	Flood risk category
On site	High
0 - 50m	High

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	14
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Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

Features are displayed on the River and coastal flooding map on **page 57**

ID	Location	Event name	Date of flood	Flood source	Flood cause	Type of flood
11	On site	123 Autumn 2000	2000-11-06 2000-12-04	Main river	Unknown	No data
12	On site	June 2007 Flood Event (Ridings Area)	2007-06-25 2007-06-26	Unknown	Unknown	Fluvial
14	3m S	123 March 1947	1947-03-19 1947-03-22	Main river	Channel capacity exceeded (no raised defences)	Fluvial
18	18m W	123 March 1947	1947-03-19 1947-03-22	Main river	Channel capacity exceeded (no raised defences)	Fluvial
29	55m NW	123 Autumn 2000	2000-10-01 2000-11-30	Main river	Unknown	No data
34	69m S	2020 February Flood Incident - Storm Dennis	2020-02-15 2020-03-19	Main river	Channel capacity exceeded (no raised defences)	Fluvial
35	73m S	2020 February Flood Incident - Storm Ciara	2020-02-08 2020-02-14	Drainage	Local drainage/surface water	No data
36	74m NW	123 March 1947	1947-03-19 1947-03-22	Main river	Channel capacity exceeded (no raised defences)	Fluvial
40	81m S	123 January 1982 - Dearne Houghton	1982-01-01 1982-01-31	Main river	Other	Fluvial
E	84m W	2020 February Flood Incident - Storm Ciara	2020-02-08 2020-02-14	Main river	Channel capacity exceeded (no raised defences)	Fluvial



ID	Location	Event name	Date of flood	Flood source	Flood cause	Type of flood
41	87m W	2020 February Flood Incident - Storm Dennis	2020-02-15 2020-03-19	Main river	Channel capacity exceeded (no raised defences)	Fluvial
52	119m NW	2020 February Flood Incident - Storm Ciara	2020-02-08 2020-02-14	Drainage	Local drainage/surface water	No data
53	120m NW	2020 February Flood Incident - Storm Dennis	2020-02-15 2020-03-19	Main river	Channel capacity exceeded (no raised defences)	Fluvial
59	166m NW	2020 February Flood Incident - Storm Ciara	2020-02-08 2020-02-14	Drainage	Local drainage/surface water	No data

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	7
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Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

Features are displayed on the River and coastal flooding map on **page 57**

ID	Location	Update
B	47m S	08/11/2022
28	53m W	08/11/2022
33	62m W	08/11/2022
39	78m S	08/11/2022
42	89m SW	08/11/2022
G	91m NW	08/11/2022
46	102m NW	08/11/2022

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

3

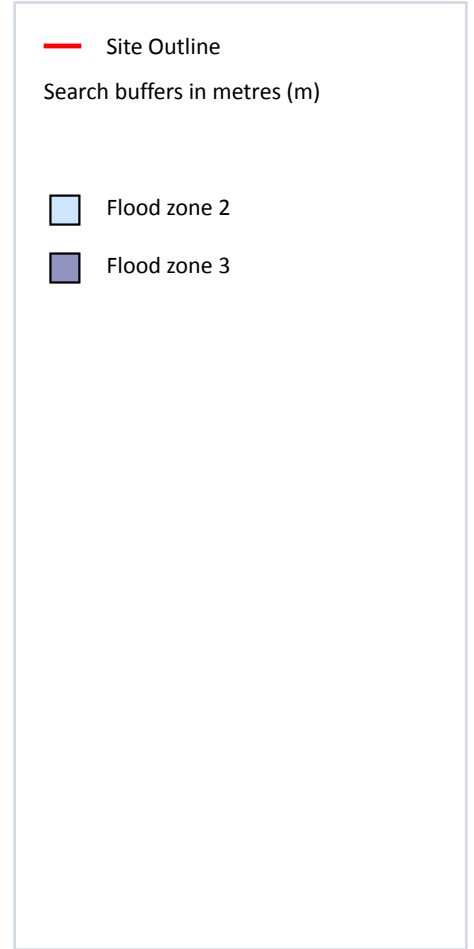
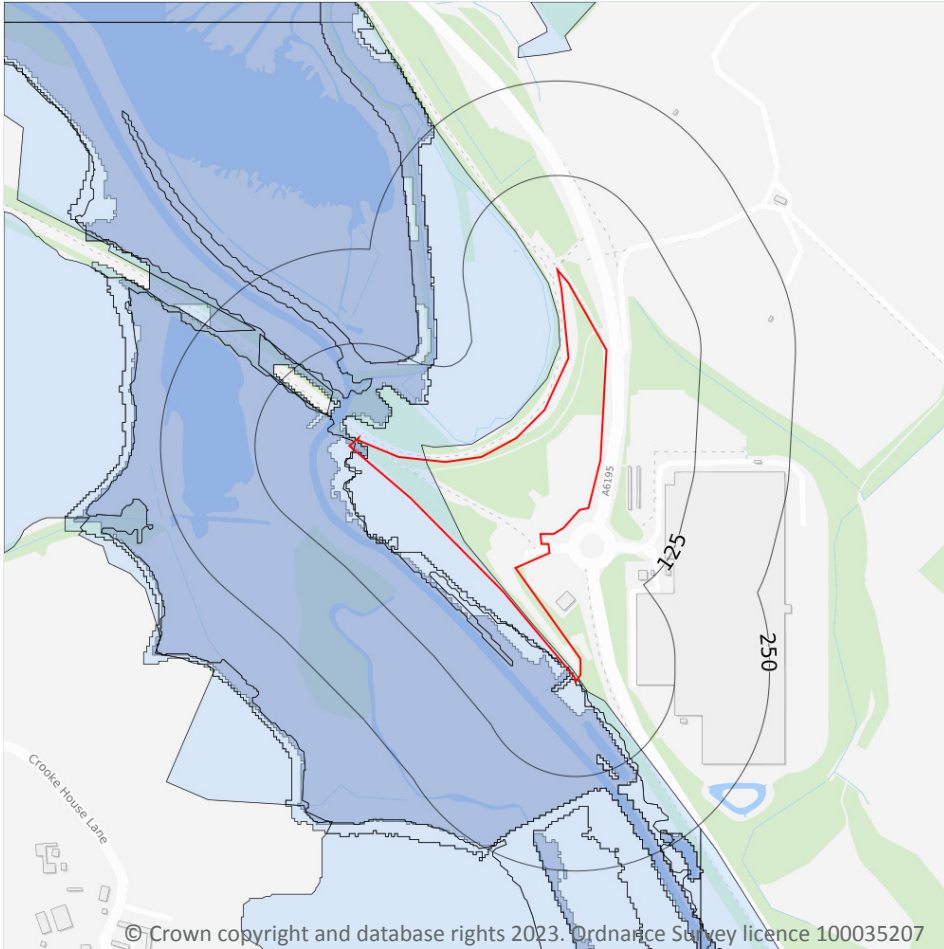
Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

Features are displayed on the River and coastal flooding map on **page 57**

ID	Location	Update
C	47m W	Flood Storage Area
D	62m NW	Flood Storage Area
F	130m S	Flood Storage Area

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones



7.6 Flood Zone 2

Records within 50m

1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 57**

Location	Type
On site	Zone 2 - (Fluvial /Tidal Models)

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m

1

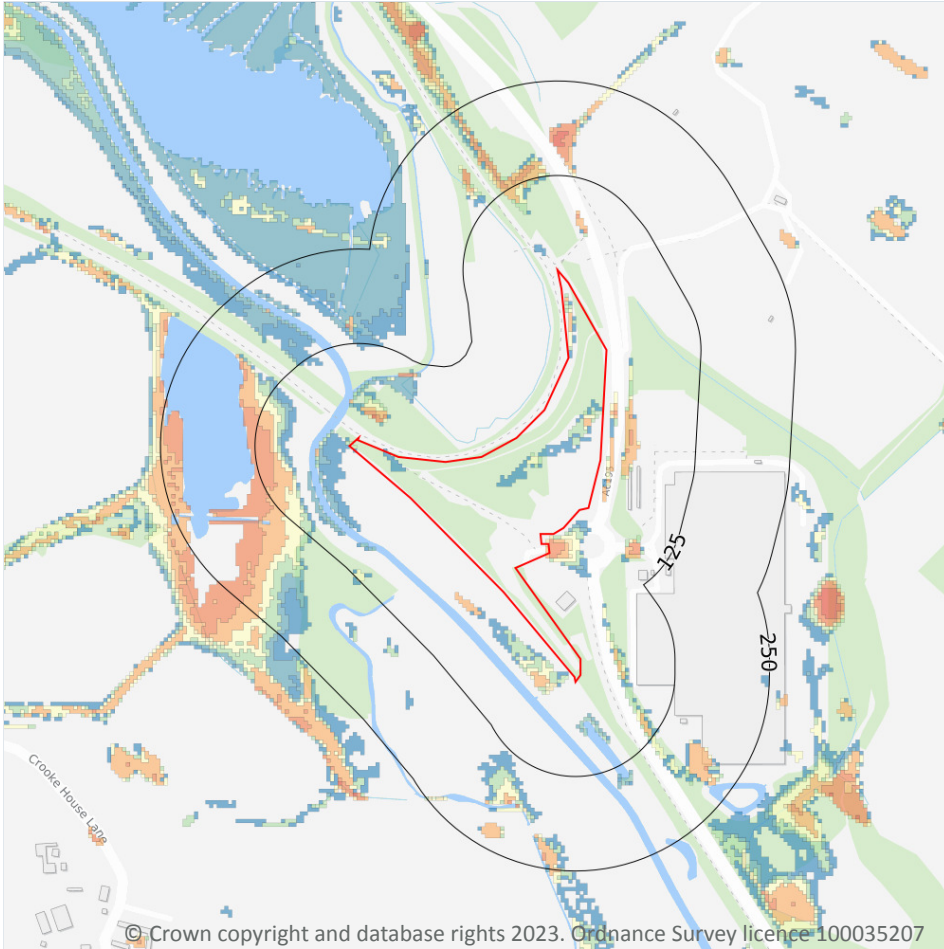
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 57**

Location	Type
On site	Zone 3 - (Fluvial /Tidal Models)

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, Greater than 1.0m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 63**

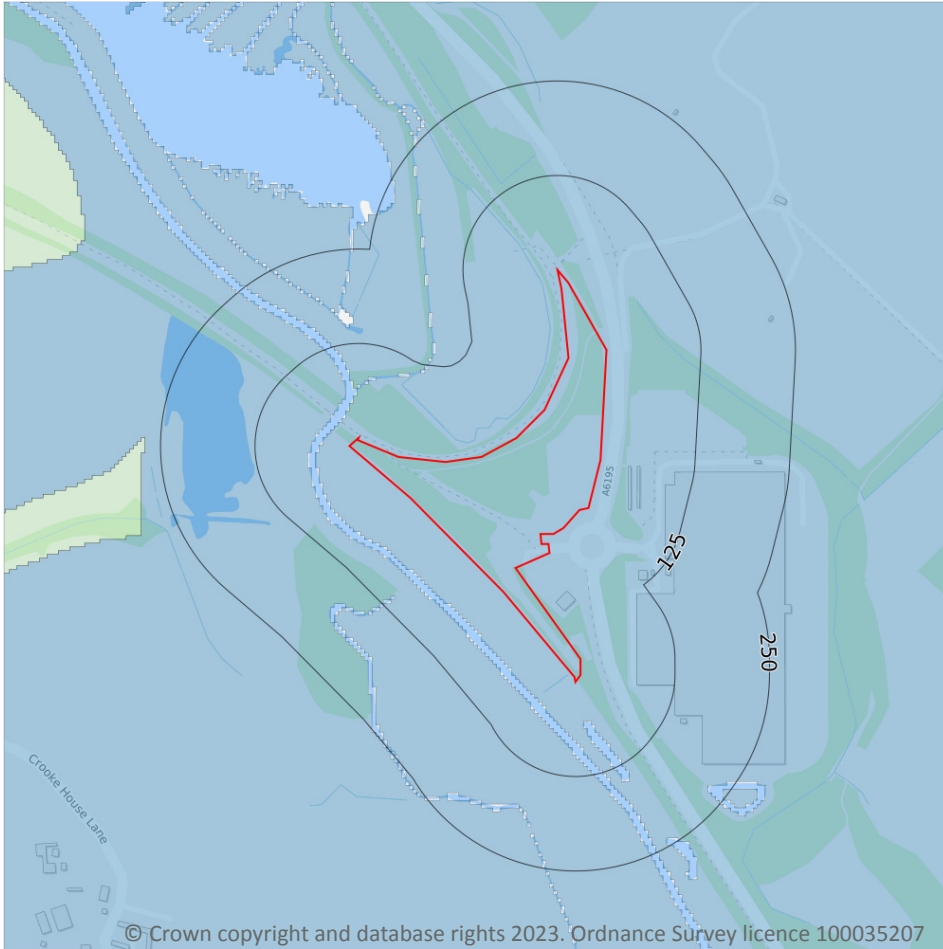
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Greater than 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Negligible

Highest risk within 50m

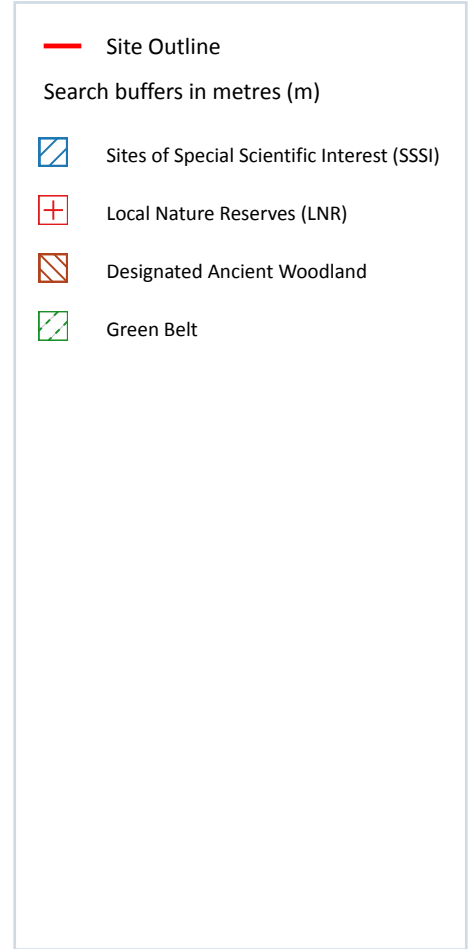
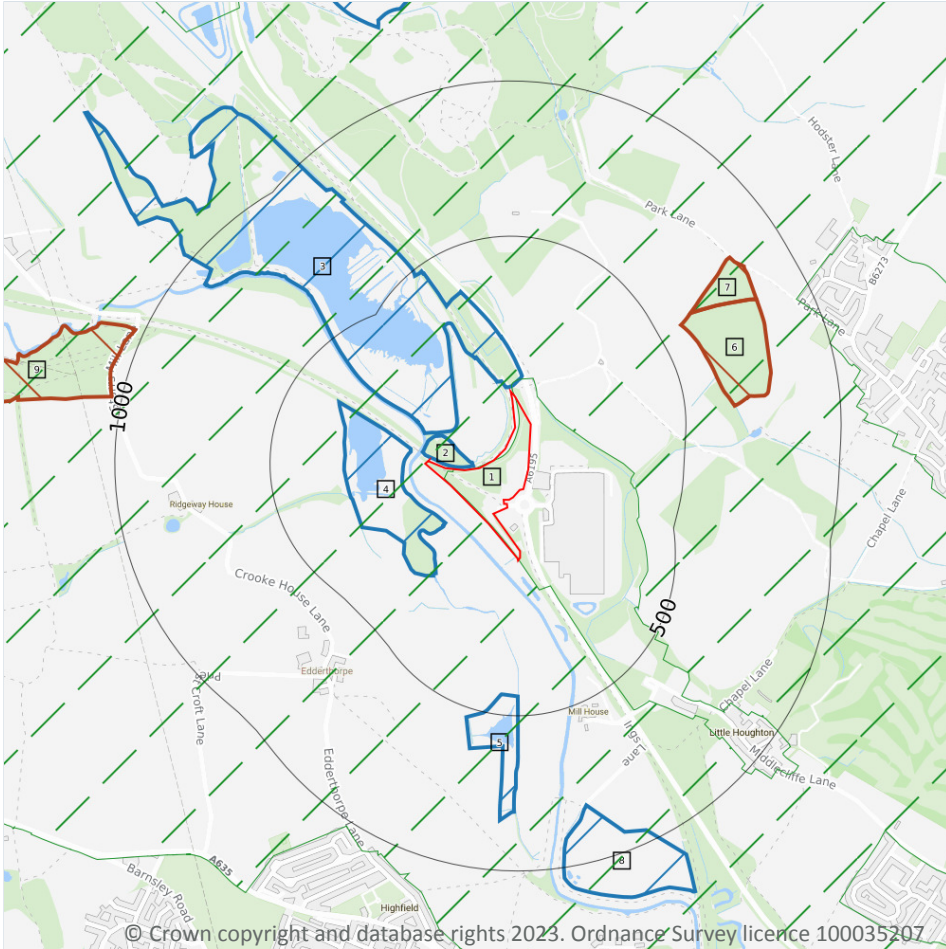
Negligible

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 65**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

6

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 66**

ID	Location	Name	Data source
2	8m W	Dearne Valley Wetlands	Natural England

ID	Location	Name	Data source
3	15m N	Dearne Valley Wetlands	Natural England
4	60m W	Dearne Valley Wetlands	Natural England
5	434m S	Dearne Valley Wetlands	Natural England
8	818m S	Dearne Valley Wetlands	Natural England
10	1247m N	Carlton Main Brickworks	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m

0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m

0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m

0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m

0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m

1

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on **page 66**

ID	Location	Name	Data source
-	1583m N	West haigh Wood	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

6

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 66**

ID	Location	Name	Woodland Type
6	579m NE	Little Park	Ancient & Semi-Natural Woodland
7	625m NE	Little Park	Ancient Replanted Woodland
9	1029m W	Storrs Wood	Ancient & Semi-Natural Woodland
-	1580m N	West Haigh Wood	Ancient & Semi-Natural Woodland
-	1639m N	West Haigh Wood	Ancient Replanted Woodland
-	1931m W	Unknown	Ancient & Semi-Natural Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m

0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

1

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 66**

ID	Location	Name	Local Authority name
1	On site	South and West Yorkshire	Barnsley

This data is sourced from the Ministry of Housing, Communities and Local Government.



10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.



10.16 Nitrate Vulnerable Zones

Records within 2000m

2

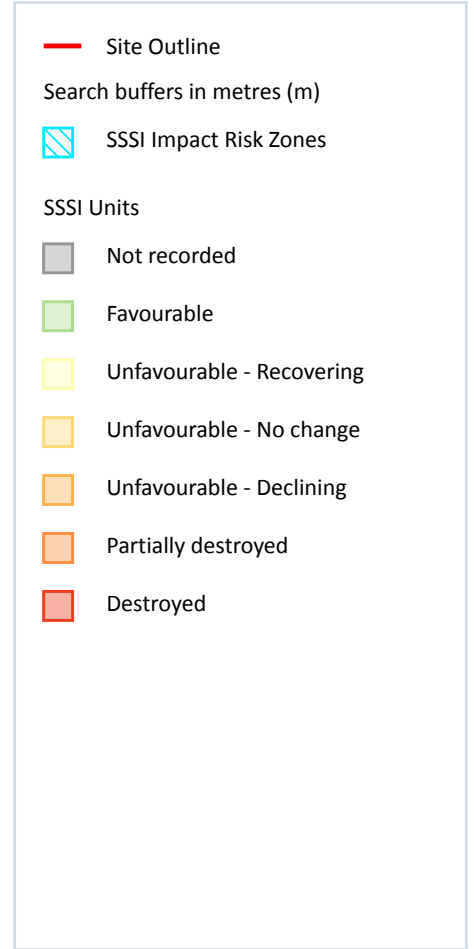
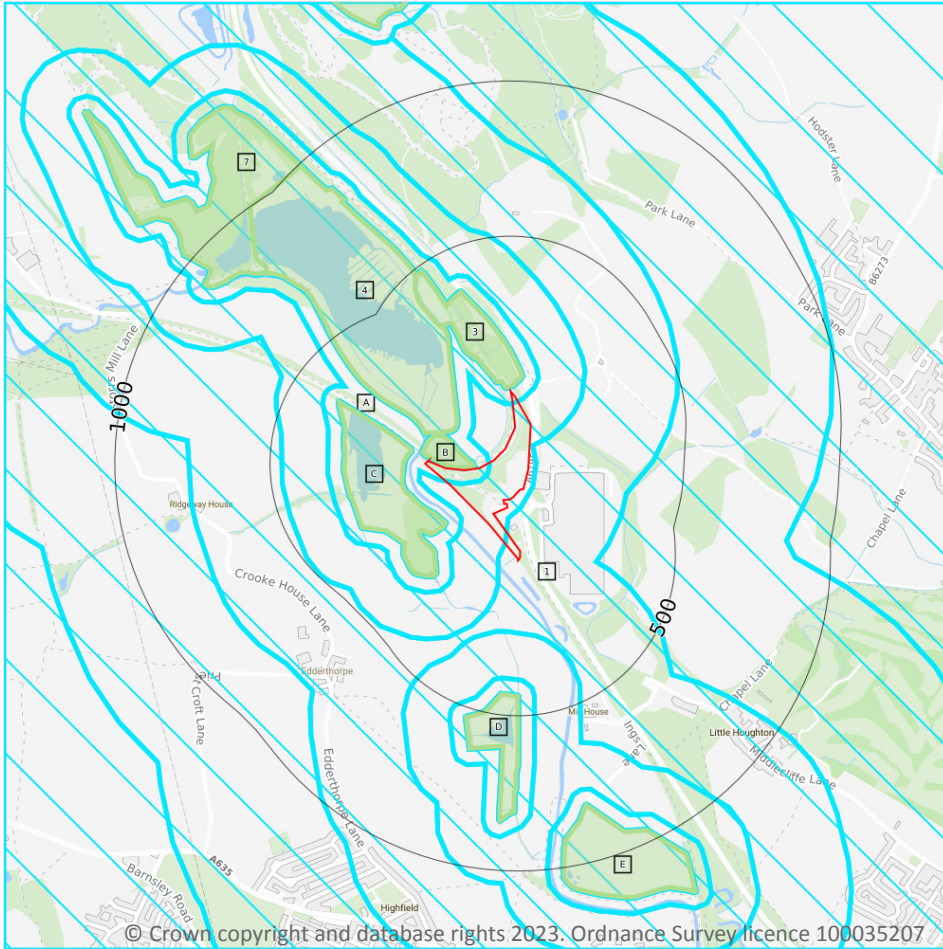
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	River Dearne NVZ	Surface Water	278	Existing
194m S	River Dearne NVZ	Surface Water	278	Existing

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units



10.17 SSSI Impact Risk Zones

Records on site

3

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 72**

ID	Location	Type of developments requiring consultation
1	On site	<p>Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.</p> <p>Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines.</p> <p>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.</p> <p>Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.</p> <p>Residential - Residential development of 50 units or more.</p> <p>Rural residential - Any residential development of 10 or more houses outside existing settlements/urban areas.</p> <p>Air pollution - Any development that could cause air pollution (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores).</p> <p>Combustion - All general combustion processes. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.</p> <p>Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management.</p> <p>Composting - Any composting proposal. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.</p> <p>Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.</p> <p>Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .</p>
A	On site	All applications - All planning applications - except householder applications.

ID	Location	Type of developments requiring consultation
A	On site	<p>All applications - All planning applications (except householder) outside or extending outside existing settlements/urban areas affecting greenspace, farmland, semi natural habitats or landscape features such as trees, hedges, streams, rural buildings/structures.</p> <p>Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.</p> <p>Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines.</p> <p>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.</p> <p>Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.</p> <p>Residential - Residential development of 10 units or more.</p> <p>Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units.</p> <p>Air pollution - Any development that could cause air pollution or dust either in its construction or operation (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores).</p> <p>Combustion - All general combustion processes. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.</p> <p>Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management.</p> <p>Composting - Any composting proposal. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.</p> <p>Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.</p> <p>Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .</p>

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	8
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 72**

ID:	B
Location:	8m W
SSSI name:	Dearne Valley Wetlands
Unit name:	Edderthorpe Woodland
Broad habitat:	Broadleaved, Mixed And Yew Woodland - Lowland
Condition:	Favourable
Reportable features:	



Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Willow Tit, Poecile montanus	Favourable	01/03/2021
Assemblages of breeding birds - Scrub	Favourable	01/03/2021

ID: 3
 Location: 15m N
 SSSI name: Dearne Valley Wetlands
 Unit name: Edderthorpe Woodland
 Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
 Condition: Favourable
 Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Willow Tit, Poecile montanus	Favourable	01/03/2021
Assemblages of breeding birds - Scrub	Favourable	01/03/2021

ID: C
 Location: 60m W
 SSSI name: Dearne Valley Wetlands
 Unit name: Edderthorpe Woodland
 Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
 Condition: Favourable
 Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Willow Tit, Poecile montanus	Favourable	01/03/2021
Assemblages of breeding birds - Scrub	Favourable	01/03/2021

ID: 4
 Location: 88m NW
 SSSI name: Dearne Valley Wetlands
 Unit name: Edderthorpe Flash
 Broad habitat: Standing Open Water And Canals
 Condition: Favourable
 Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Gadwall, Anas strepera	Favourable	01/03/2021



Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Shoveler, Anas clypeata	Favourable	01/03/2021
Aggregations of non-breeding birds - Gadwall, Anas strepera	Favourable	01/03/2021
Aggregations of non-breeding birds - Shoveler, Anas clypeata	Favourable	01/03/2021
Assemblages of breeding birds - Lowland damp grasslands	Favourable	01/03/2021
Assemblages of breeding birds - Mixed	Favourable	01/03/2021

ID: D
Location: 434m S
SSSI name: Dearne Valley Wetlands
Unit name: Houghton
Broad habitat: Standing Open Water And Canals
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Gadwall, Anas strepera	Favourable	01/03/2021
Aggregations of breeding birds - Garganey, Anas querquedula	Favourable	01/03/2021
Aggregations of breeding birds - Shoveler, Anas clypeata	Favourable	01/03/2021
Assemblages of breeding birds - Lowland damp grasslands	Favourable	01/03/2021
Assemblages of breeding birds - Mixed	Favourable	01/03/2021

ID: 7
Location: 798m NW
SSSI name: Dearne Valley Wetlands
Unit name: Cudworth Common
Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Willow Tit, Poecile montanus	Favourable	01/03/2021
Assemblages of breeding birds - Scrub	Favourable	01/03/2021



ID: E
 Location: 818m S
 SSSI name: Dearne Valley Wetlands
 Unit name: Little Houghton
 Broad habitat: Fen, Marsh And Swamp - Lowland
 Condition: Favourable
 Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Gadwall, <i>Anas strepera</i>	Favourable	01/03/2021
Aggregations of breeding birds - Shoveler, <i>Anas clypeata</i>	Favourable	01/03/2021
Assemblages of breeding birds - Lowland damp grasslands	Favourable	01/03/2021
Assemblages of breeding birds - Mixed	Favourable	01/03/2021

ID: 9
 Location: 1247m N
 SSSI name: Carlton Main Brickworks
 Unit name: Carlton Main Brickworks
 Broad habitat: Earth Heritage
 Condition: Favourable
 Reportable features:

Feature name	Feature condition	Date of assessment
EA - Westphalian	Favourable	04/10/2010

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.



This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m

0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m

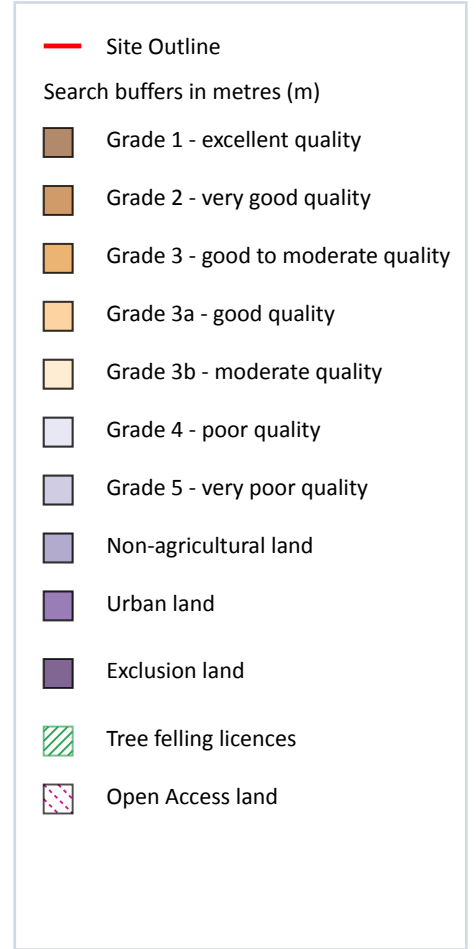
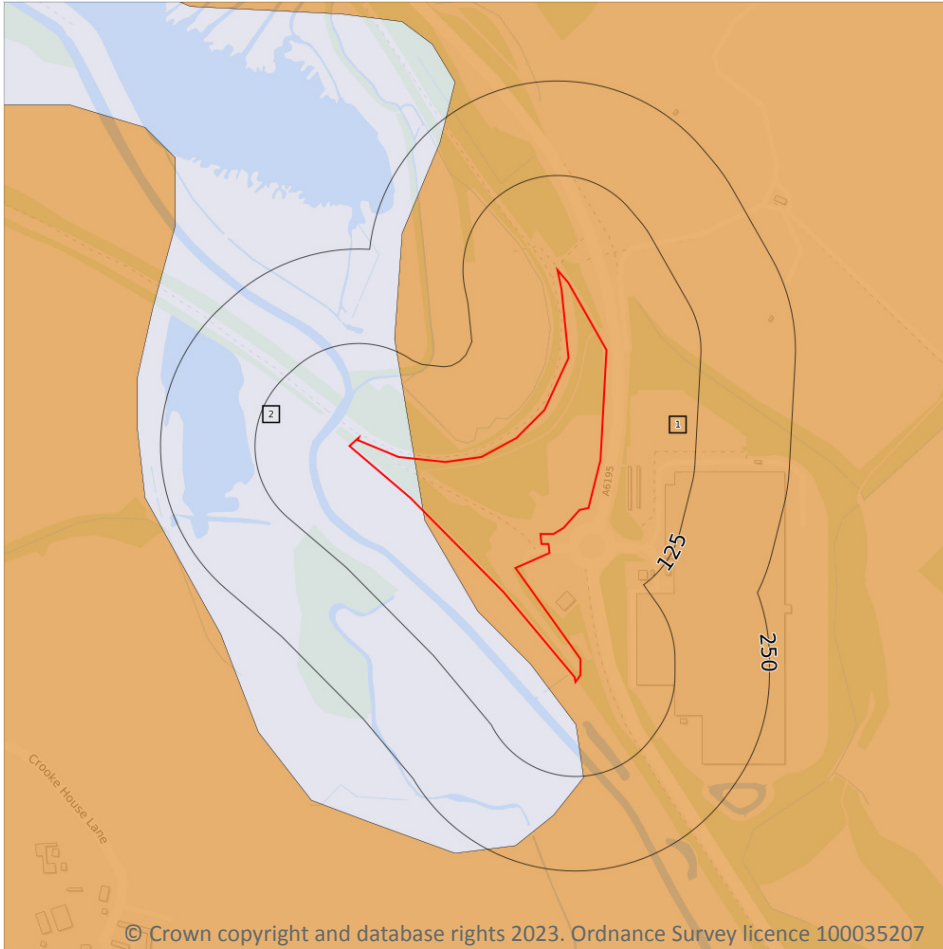
0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



12 Agricultural designations



12.1 Agricultural Land Classification

Records within 250m

2

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 80**

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

ID	Location	Classification	Description
2	On site	Grade 4	Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0
----------------------------	----------

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0
----------------------------	----------

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	3
----------------------------	----------

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

Location	Reference	Scheme	Start Date	End date
6m N	AG00288777	Entry Level plus Higher Level Stewardship	01/07/2009	30/06/2019
53m NE	AG00535151	Entry Level Stewardship	01/12/2013	30/11/2018
63m NW	AG00288777	Entry Level plus Higher Level Stewardship	01/07/2009	30/06/2019

This data is sourced from Natural England.



12.5 Countryside Stewardship Schemes

Records within 250m**3**

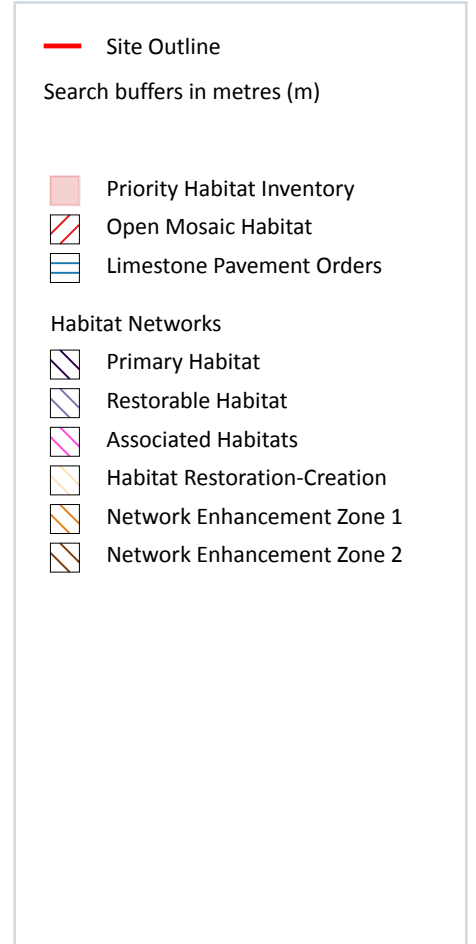
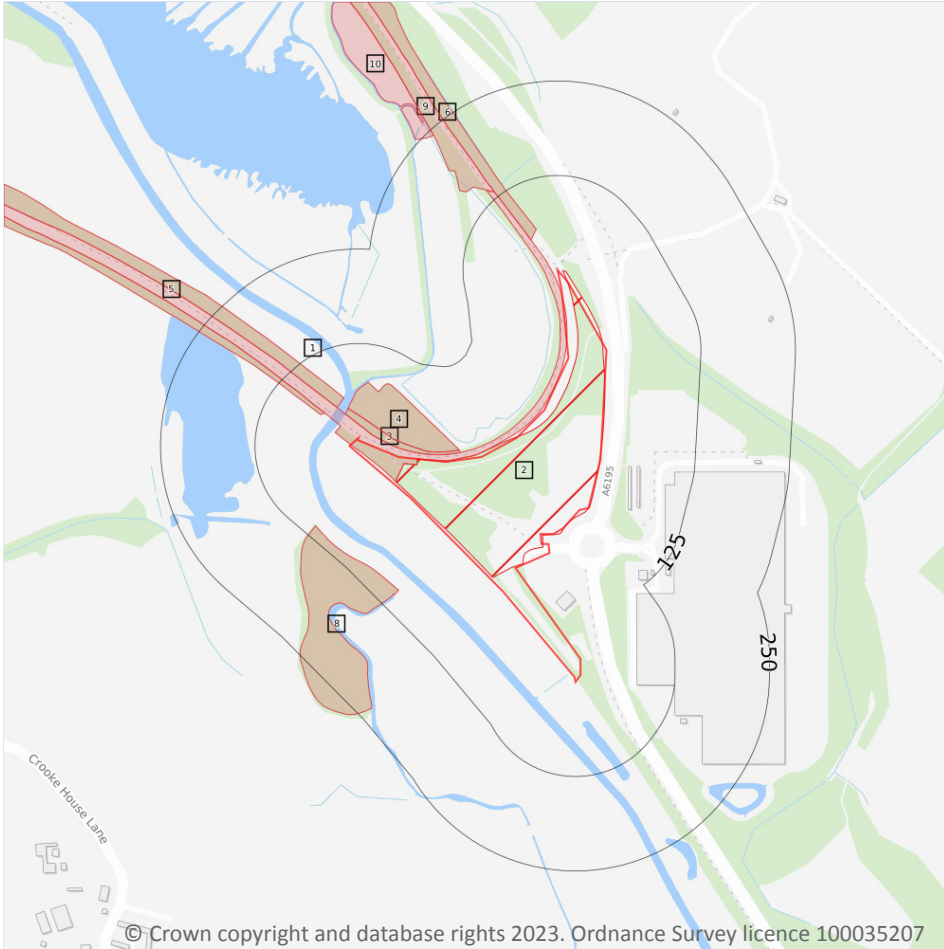
Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
6m N	808573	Countryside Stewardship (Higher Tier)	01/01/2020	31/12/2029
57m NW	490960	Countryside Stewardship (Middle Tier)	01/01/2018	31/12/2022
61m NW	808573	Countryside Stewardship (Higher Tier)	01/01/2020	31/12/2029

This data is sourced from Natural England.



13 Habitat designations



13.1 Priority Habitat Inventory

Records within 250m

9

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 83**

ID	Location	Main Habitat	Other habitats
1	On site	No main habitat but additional habitats present	Additional: DWOOD (INV 50%)
3	8m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	11m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
5	49m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
6	53m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
7	54m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
8	97m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
9	132m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
10	242m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0
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Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	1
----------------------------	----------

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

Features are displayed on the Habitat designations map on **page 83**

ID	Location	Site reference	Identification confidence	Primary source	Secondary source	Tertiary source
2	On site	NLUD Ref: 440800273	Low	National Land Use Database - Previously Developed Land	UK Perspectives Aerial Photography	-

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m	0
----------------------------	----------

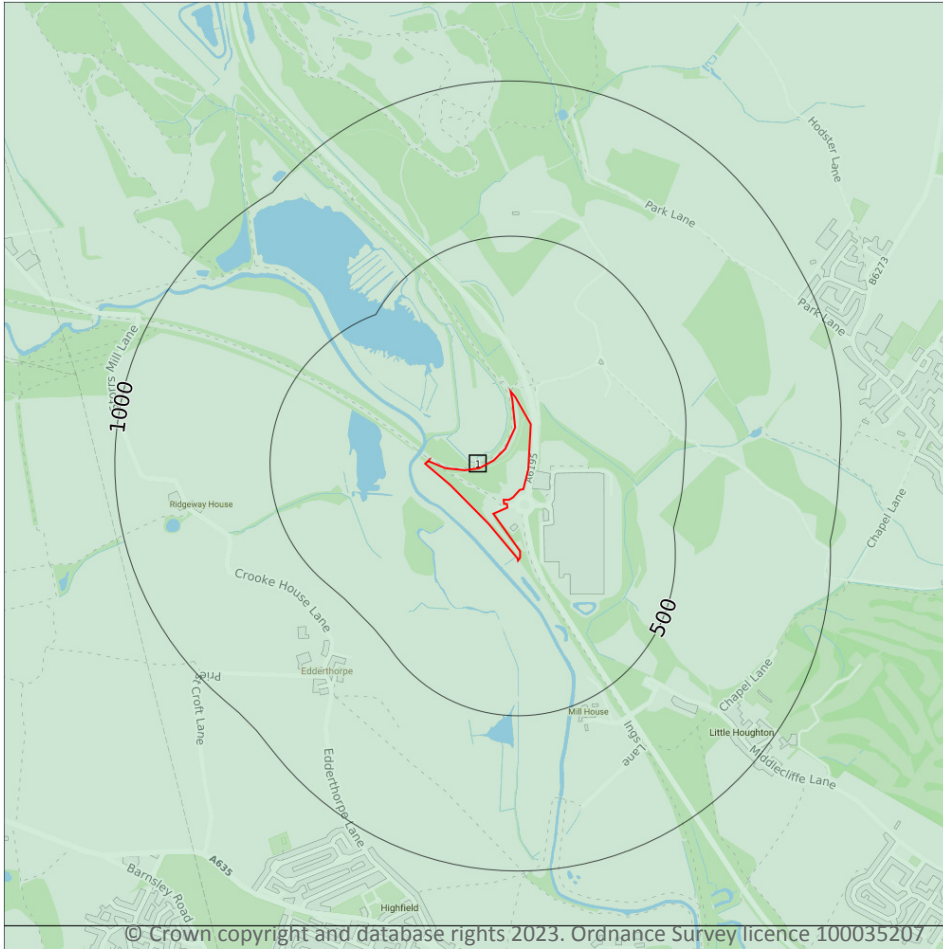
Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their

removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
 Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

1

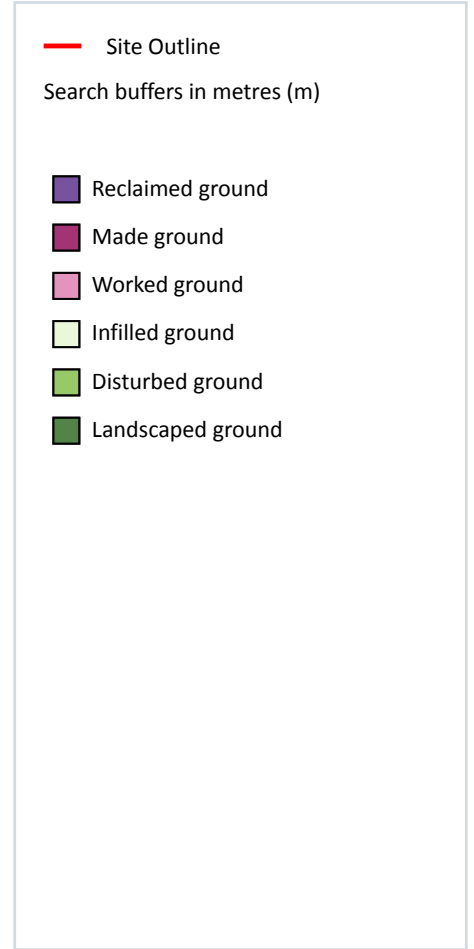
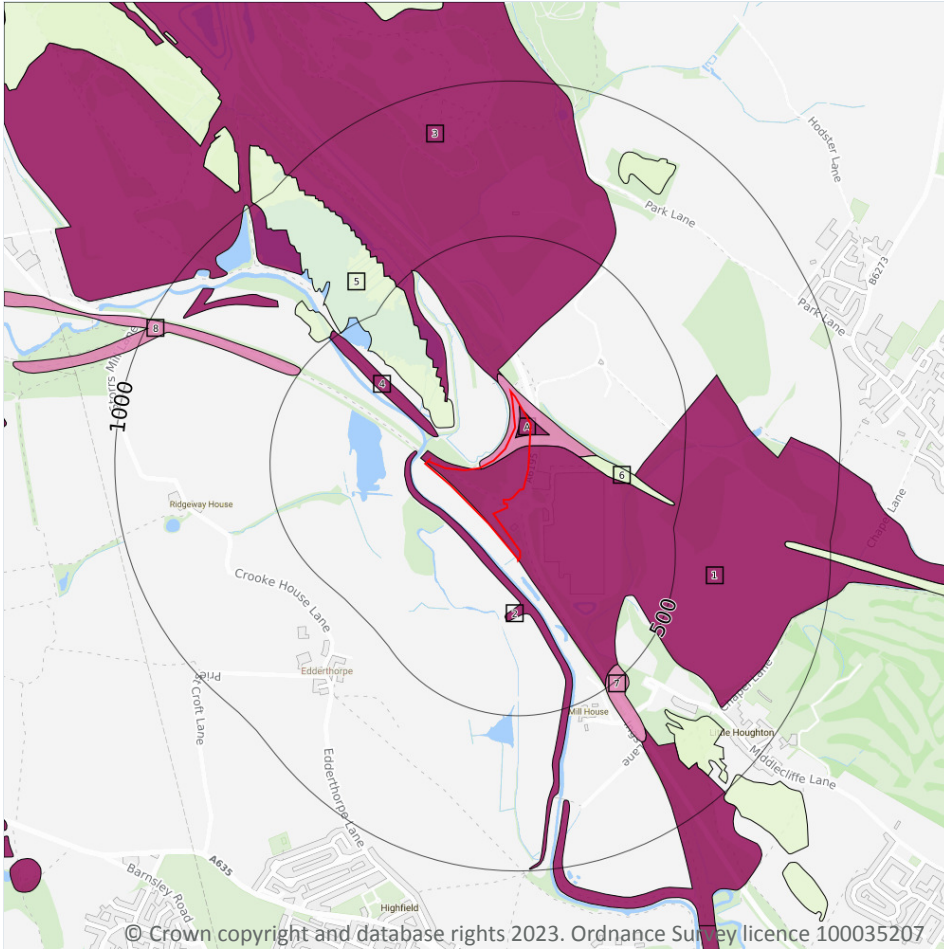
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 86**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	SE40NW

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



14.2 Artificial and made ground (10k)

Records within 500m

10

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 87**

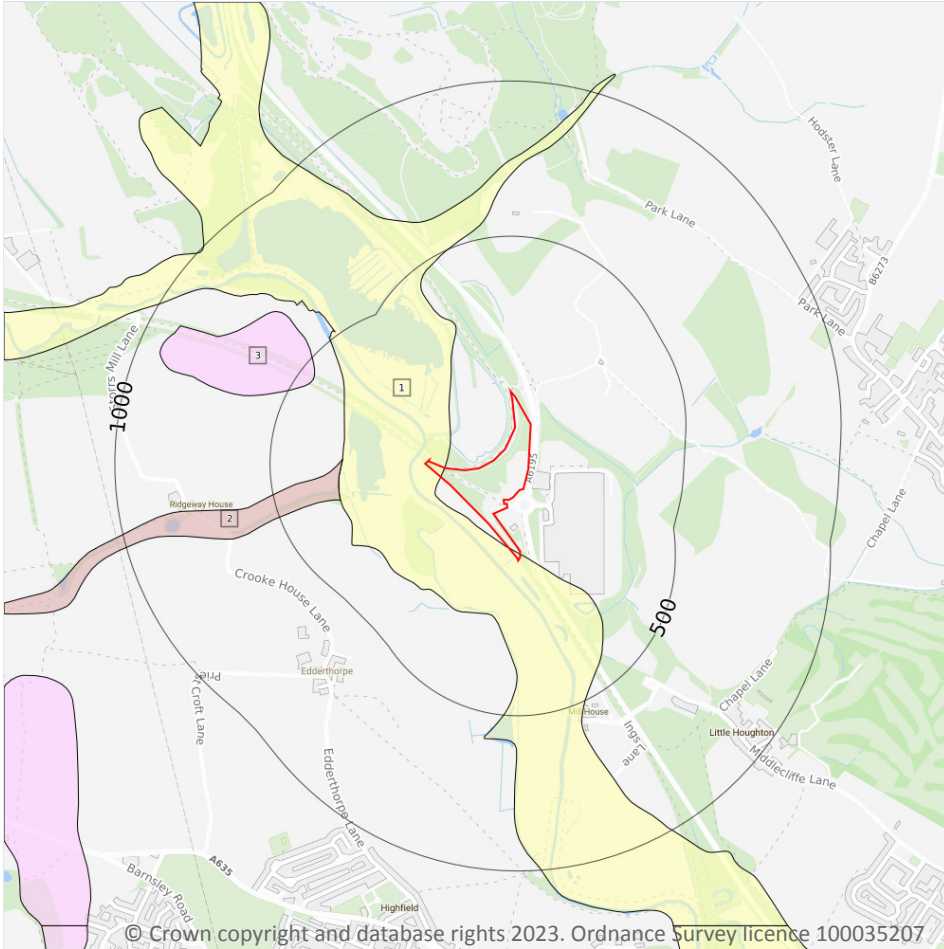
ID	Location	LEX Code	Description	Rock description
1	On site	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	On site	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	On site	WGR-VOID	Worked Ground (Undivided)	Void
2	42m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
3	51m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	78m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	109m NW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
6	162m E	WMGR-ARTDP	Infilled Ground	Artificial Deposit
7	459m SE	WGR-VOID	Worked Ground (Undivided)	Void
8	500m NW	WGR-VOID	Worked Ground (Undivided)	Void

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

3

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 89**

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZ	Alluvium - Clay And Silt	Clay And Silt
2	267m W	HEAD-DMTN	Head - Diamicton	Diamicton
3	452m NW	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

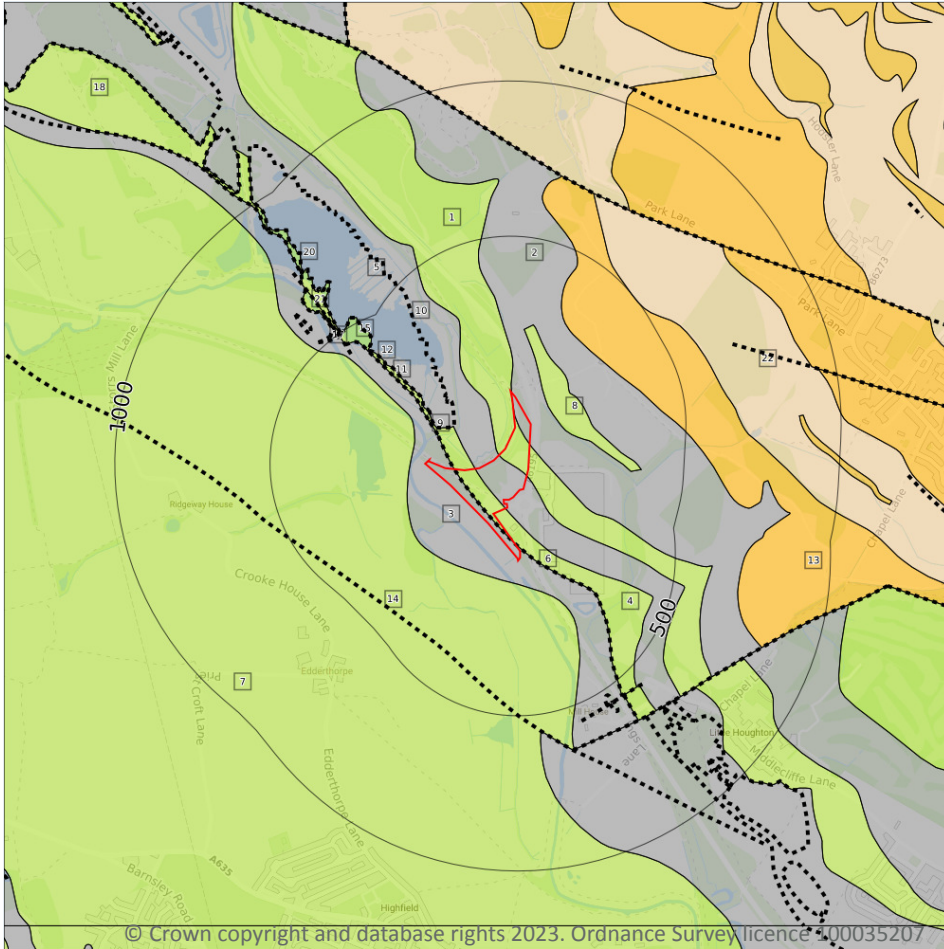
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

12

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 91**

ID	Location	LEX Code	Description	Rock age
1	On site	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
2	On site	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age - Duckmantian Sub-age

ID	Location	LEX Code	Description	Rock age
3	On site	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
4	On site	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
5	On site	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
7	47m W	MXR-SDST	Mexborough Rock - Sandstone	Bolsovia Sub-age
8	77m NE	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
13	272m NE	AR-SDST	Ackworth Rock - Sandstone	Bolsovia Sub-age
15	404m NW	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
18	498m NW	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
21	499m NW	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
22	499m NE	PUCM-MDSS	Pennine Upper Coal Measures Formation - Mudstone, Siltstone And Sandstone	Westphalian D Sub-age - Bolsovia Sub-age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

10

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 91**

ID	Location	Category	Description
6	On site	ROCK	Coal seam, inferred
9	84m NW	ROCK	Coal seam, observed
10	109m NW	ROCK	Coal seam, observed
11	122m NW	ROCK	Coal seam, inferred
12	161m NW	ROCK	Coal seam, observed

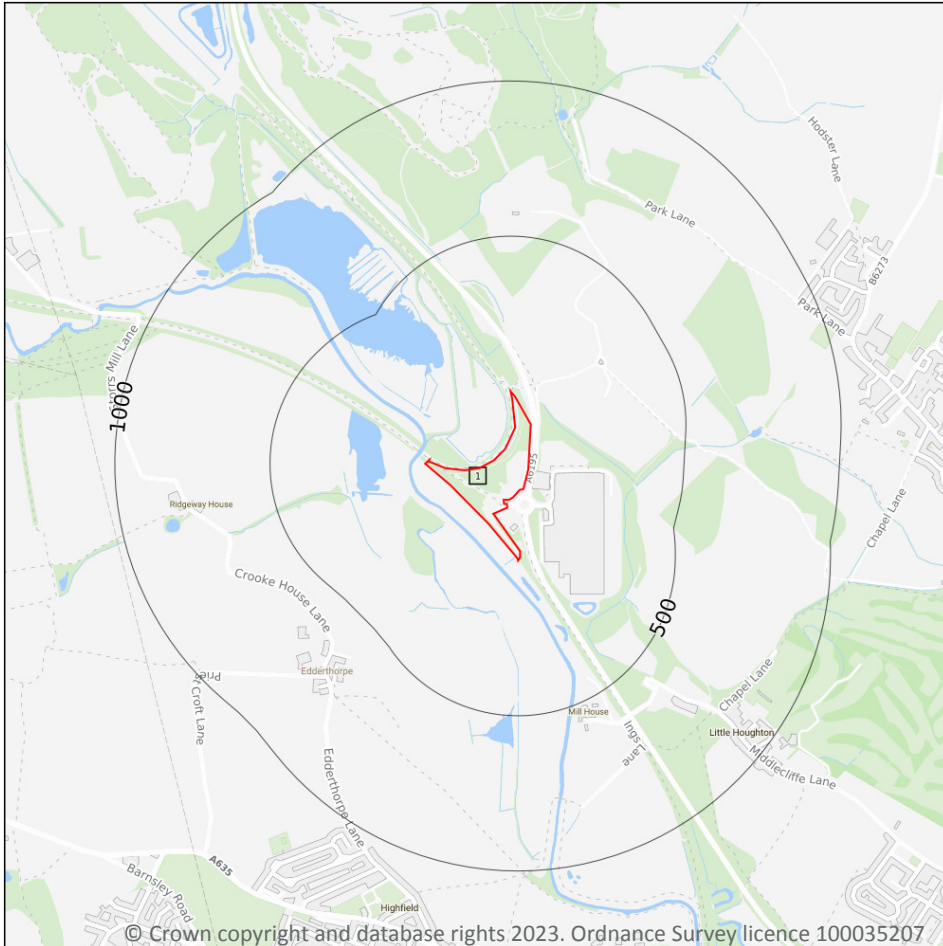


ID	Location	Category	Description
14	374m S	FAULT	Normal fault, inferred
16	425m NW	FAULT	Normal fault, inferred
17	492m NW	ROCK	Coal seam, observed
19	498m NW	ROCK	Coal seam, observed
20	498m NW	ROCK	Coal seam, observed

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



- Site Outline
- Search buffers in metres (m)
- Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

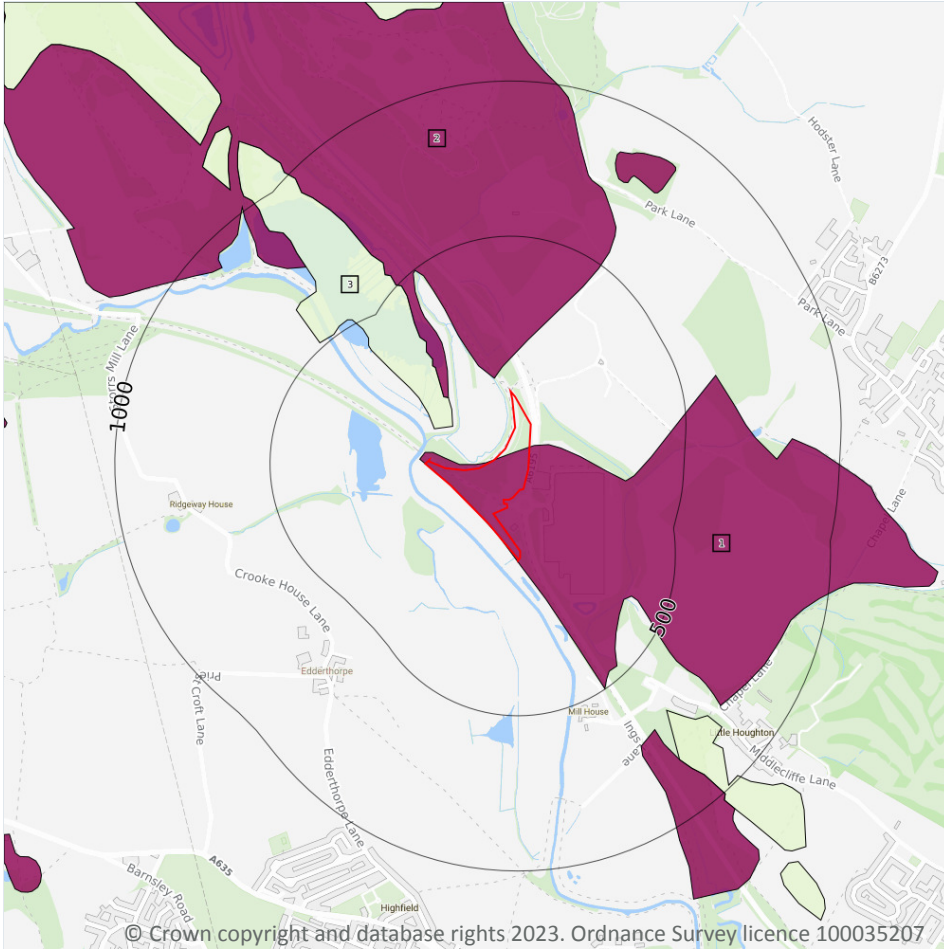
Features are displayed on the Geology 1:50,000 scale - Availability map on [page 94](#)

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW087_barnsley_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground



15.2 Artificial and made ground (50k)

Records within 500m

3

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 95**

ID	Location	LEX Code	Description	Rock description
1	On site	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	68m N	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	103m NW	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.



15.3 Artificial ground permeability (50k)

Records within 50m

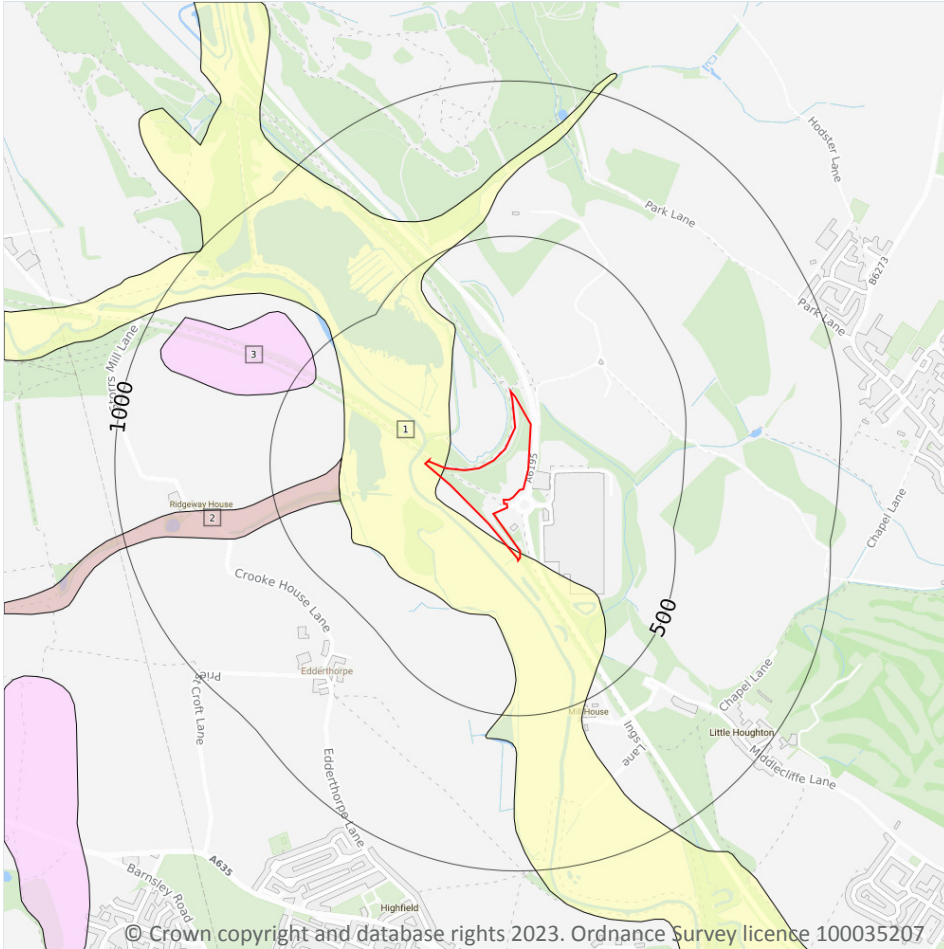
1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	Very High	Low

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

3

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 97**

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	270m W	HEAD-DMTN	HEAD	DIAMICTON
3	445m NW	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m

1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Intergranular	High	Very Low

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

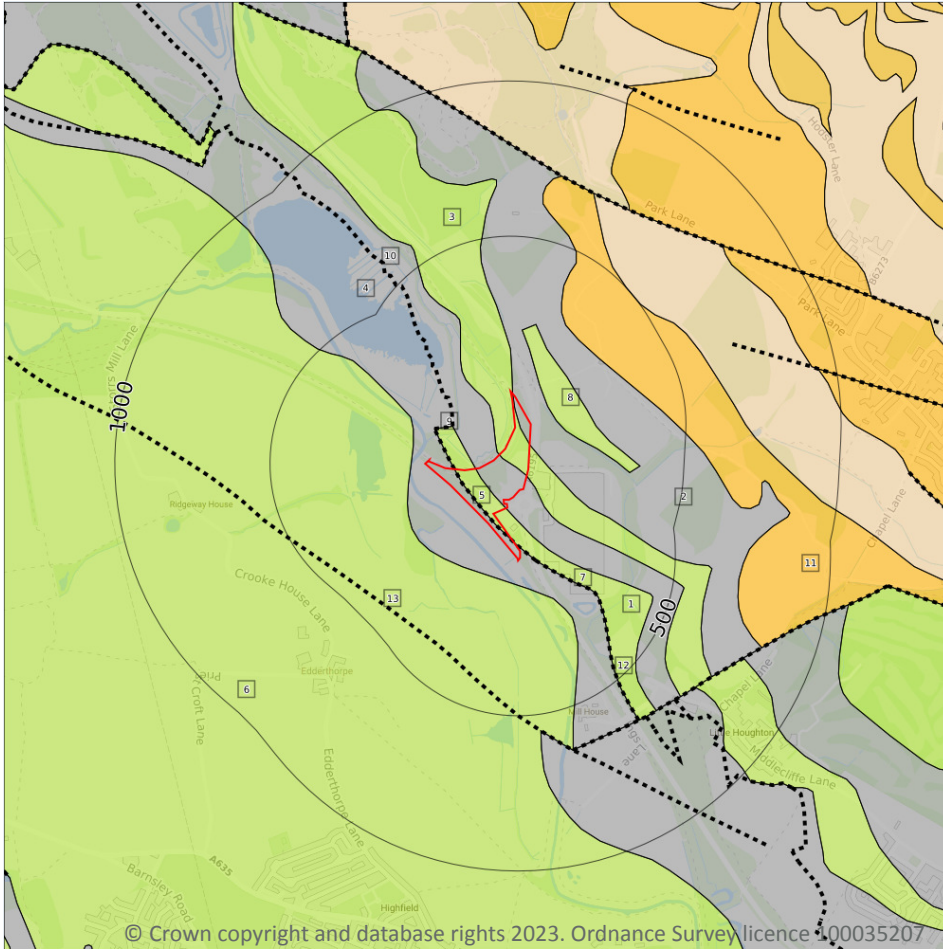
Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

7

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 99**

ID	Location	LEX Code	Description	Rock age
1	On site	PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
2	On site	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

ID	Location	LEX Code	Description	Rock age
3	On site	PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
4	On site	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
6	45m W	MXR-SDST	MEXBOROUGH ROCK - SANDSTONE	WESTPHALIAN
8	76m NE	PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
11	274m NE	AR-SDST	ACKWORTH ROCK - SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

5

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Moderate	Low
On site	Fracture	Moderate	Low
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate
45m W	Fracture	High	Moderate

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

6

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 99**

ID	Location	Category	Description
5	On site	ROCK	Coal seam, inferred

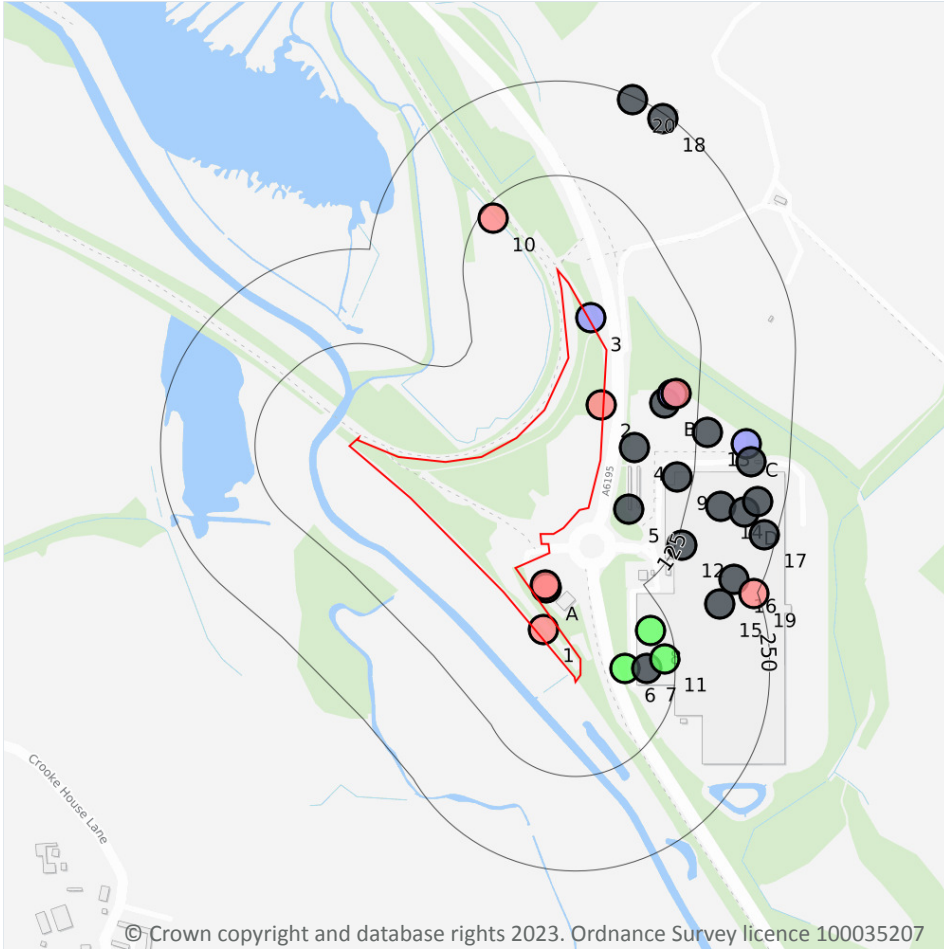


ID	Location	Category	Description
7	51m SE	ROCK	Coal seam, inferred
9	103m NW	ROCK	Coal seam, inferred
10	134m NW	ROCK	Coal seam, inferred
12	334m SE	ROCK	Coal seam, inferred
13	374m S	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m

29

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 102**

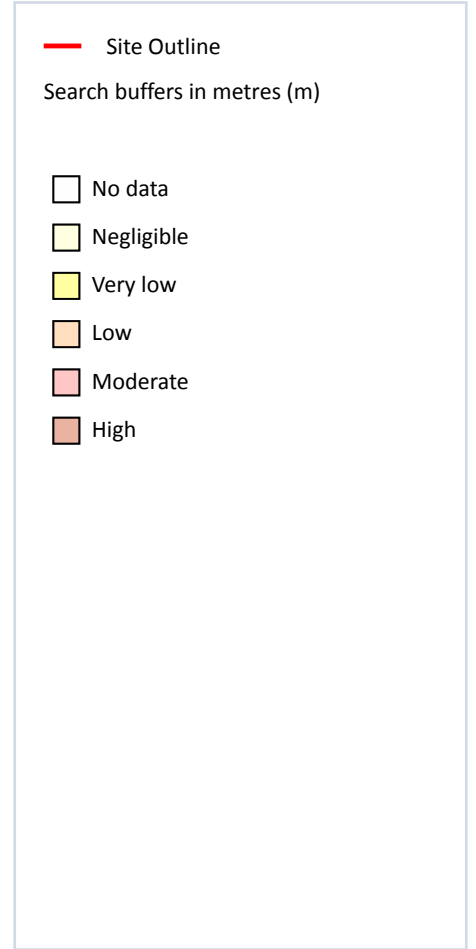
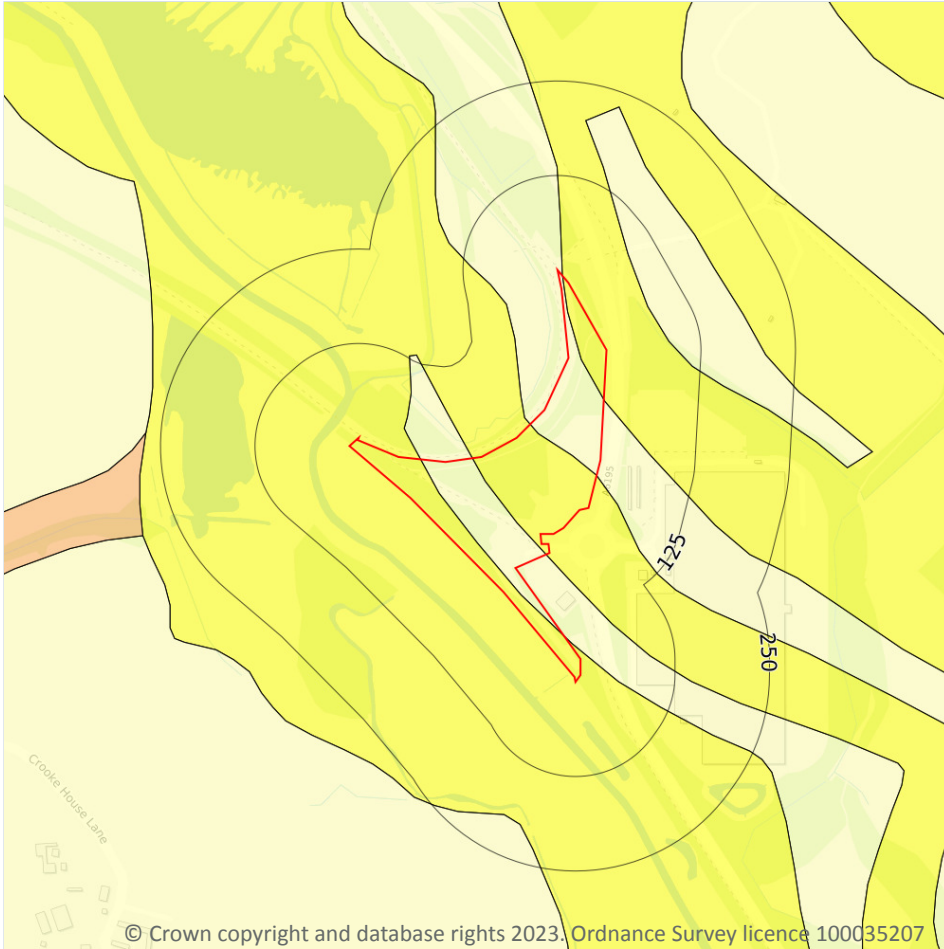
ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	441687 406246	HOUGHTON MAIN COLLIERY 4 U/G	37.8	N	105480
2	On site	441763 406543	HOUGHTON MAIN COLLIERY 11 U/G	32.61	N	105483
3	3m NE	441750 406658	GRIMETHORPE	7.01	N	105473

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	18m S	441691 406301	HOUGHTON MAIN BOREHOLE 2	439.69	N	18532857
A	19m S	441689 406305	HOUGHTON MAIN 2A	560.95	N	18532856
4	44m E	441807 406486	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH6	-	Y	N/A
5	52m E	441800 406405	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH10	-	Y	N/A
6	59m SE	441795 406194	HOUGHTON MAIN COLLIERY NO.6A SURF BH	12.77	N	105590
B	80m NE	441847 406545	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH1	-	Y	N/A
7	87m SE	441823 406194	HOUGHTON MAIN BARNSELY TP 3	-	Y	N/A
B	90m NE	441857 406557	THREE BHS AT GRIMETHORPE	9.14	N	105472
B	96m NE	441863 406558	HOUGHTON MAIN COLLIERY 5 U/G	31.39	N	105481
8	100m SE	441829 406244	HOUGHTON MAIN COLLIERY NO.4A SURF BH	19.45	N	105588
9	104m E	441864 406448	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH7	-	Y	N/A
10	110m N	441620 406790	HOUGHTON MAIN COLLIERY BARNSELY	31.0	N	18532958
11	111m SE	441847 406207	HOUGHTON MAIN COLLIERY NO.5A SURF BH	17.08	N	105589
12	133m E	441870 406358	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH11	-	Y	N/A
13	139m E	441904 406506	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH2	-	Y	N/A
14	169m E	441921 406409	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH8	-	Y	N/A
C	191m E	441955 406492	THREE BHS AT GRIMETHORPE	8.84	N	105471
15	198m SE	441920 406280	HOUGHTON MAIN BARNSELY TP 1	-	Y	N/A
C	198m E	441961 406468	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH3	-	Y	N/A
D	202m E	441953 406401	HOUGHTON MAIN BARNSELY TP 2	-	Y	N/A
16	215m SE	441939 406312	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH12	-	Y	N/A
D	215m E	441970 406415	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH5	-	Y	N/A
17	234m E	441979 406371	PROJECT PHOENIX, NEAR GREAT HOUGHTON BH9	-	Y	N/A
18	244m N	441845 406922	HOUGHTON MAIN BARNSELY TP 5	-	Y	N/A
19	245m SE	441965 406293	HOUGHTON MAIN COLLIERY NO.1A SURF BH	33.1	N	105587
20	247m N	441805 406947	HOUGHTON MAIN BARNSELY R2	-	Y	N/A

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

2

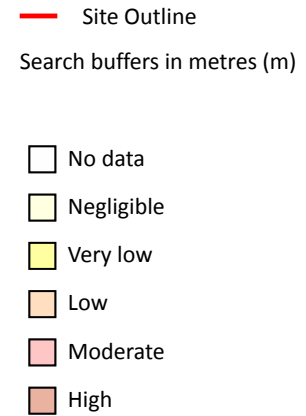
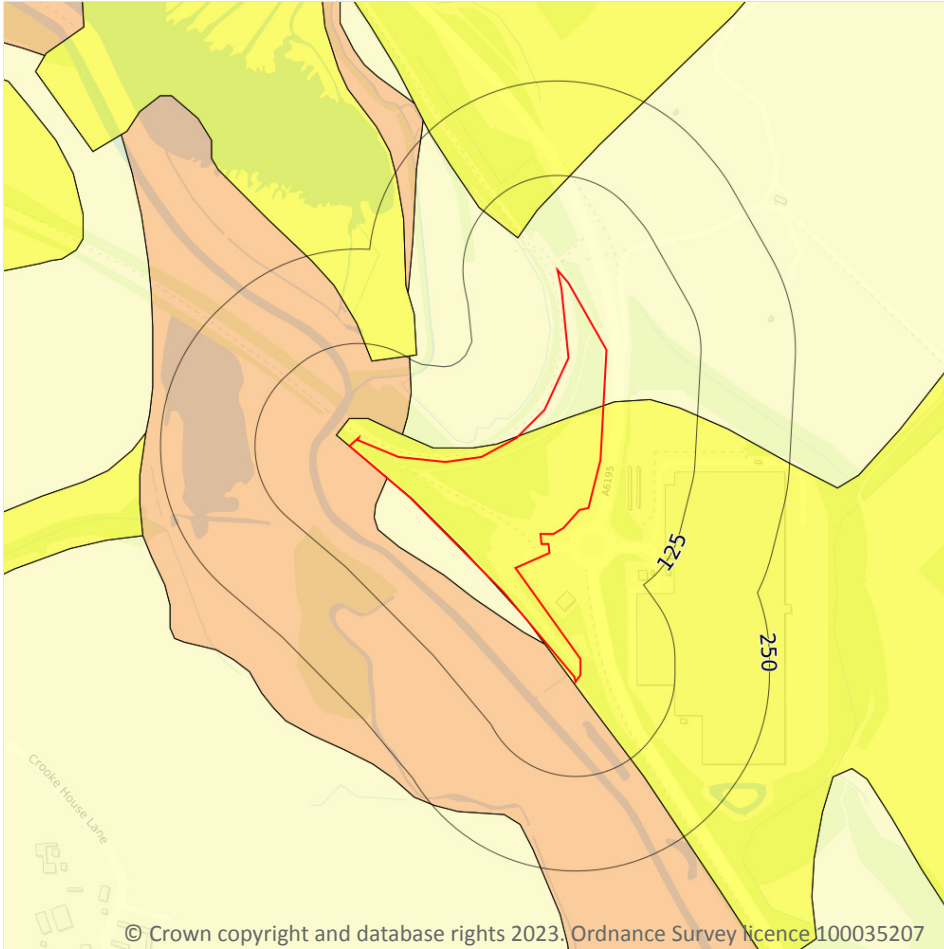
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 104**

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m

3

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 105**

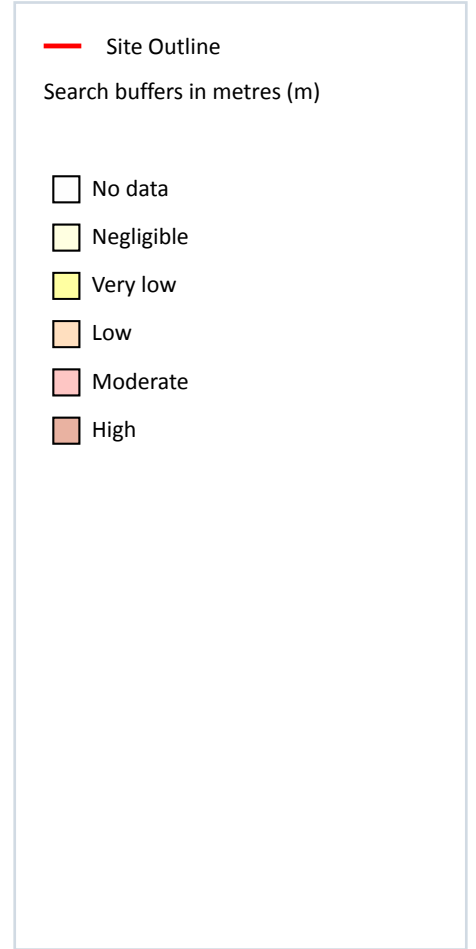
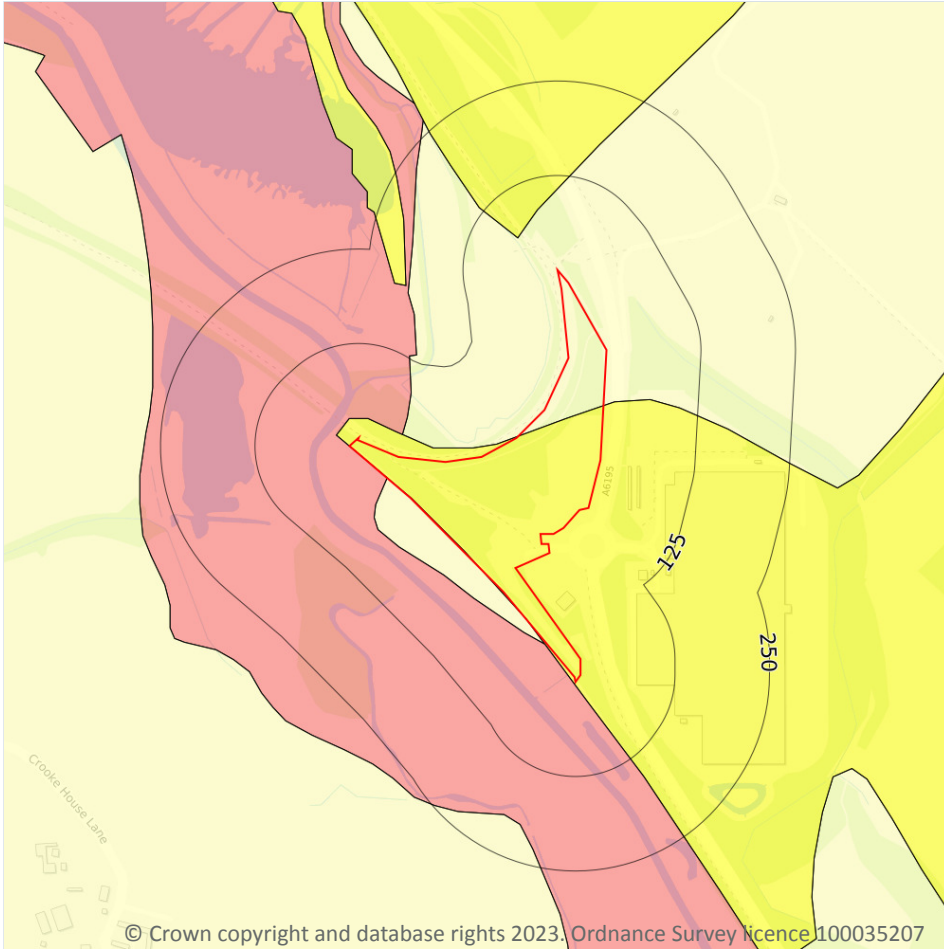
Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.
On site	Low	Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

3

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 107**

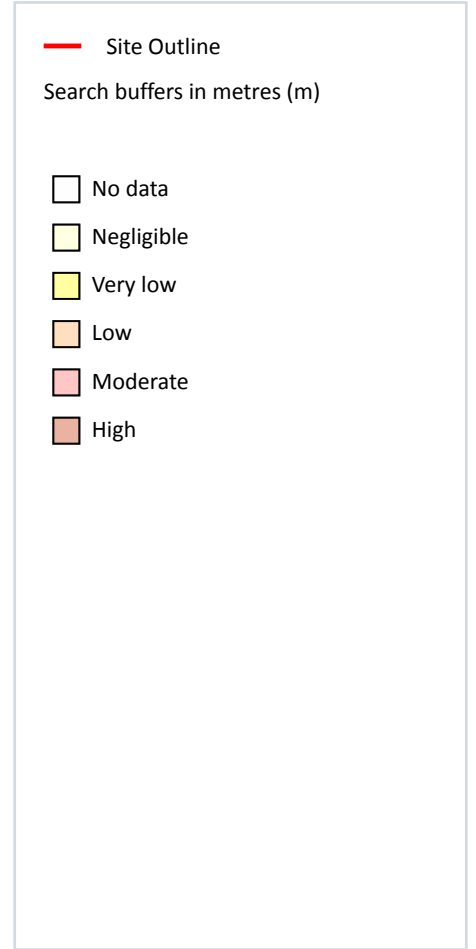
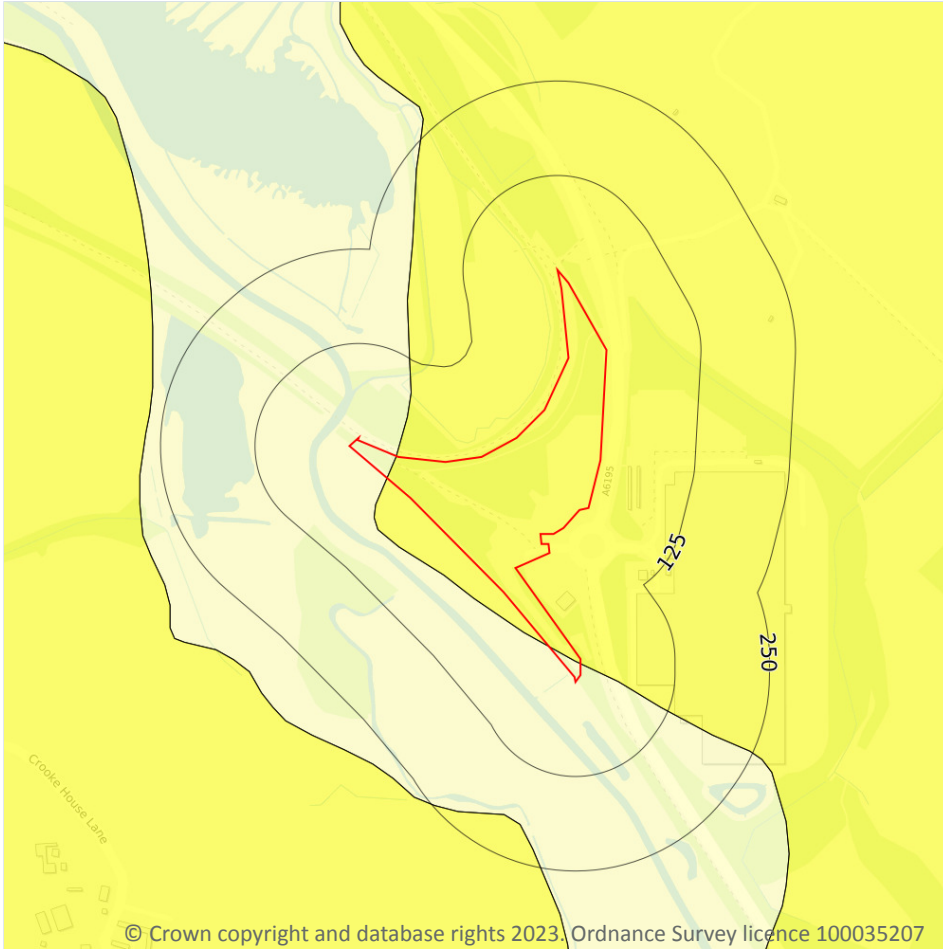
Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.
On site	Very low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.

Location	Hazard rating	Details
On site	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m

2

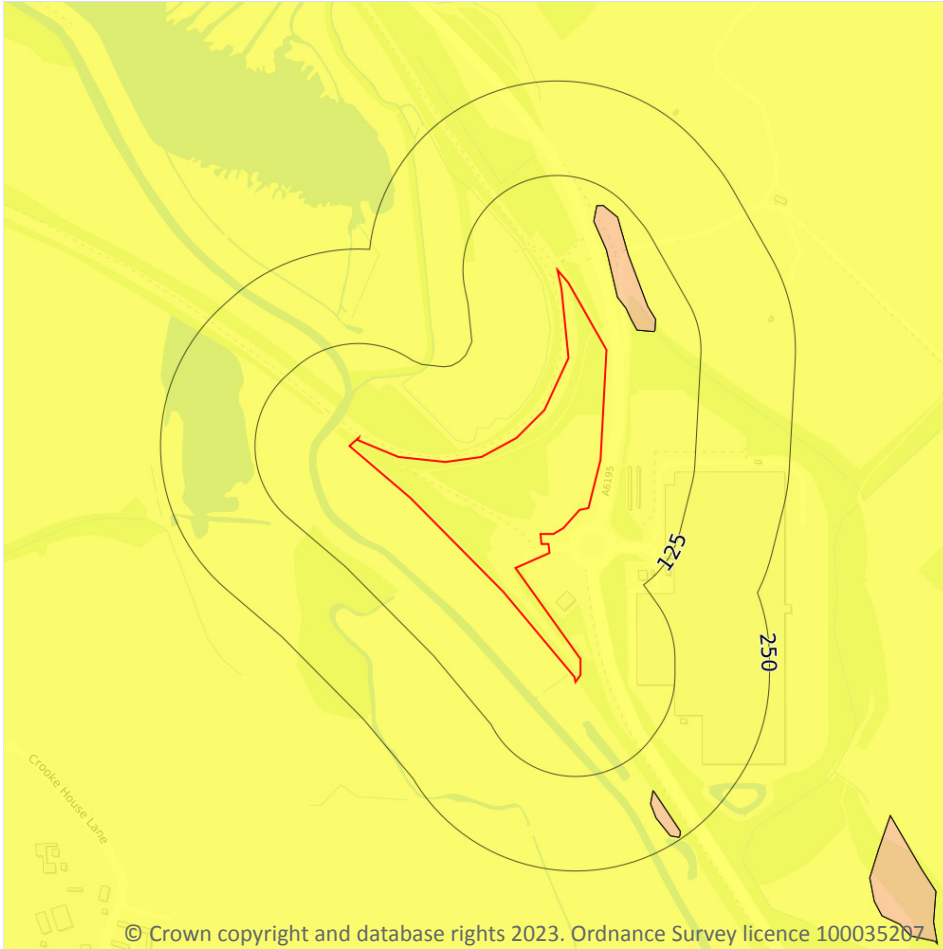
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 109**

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



— Site Outline
Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m

2

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 110**

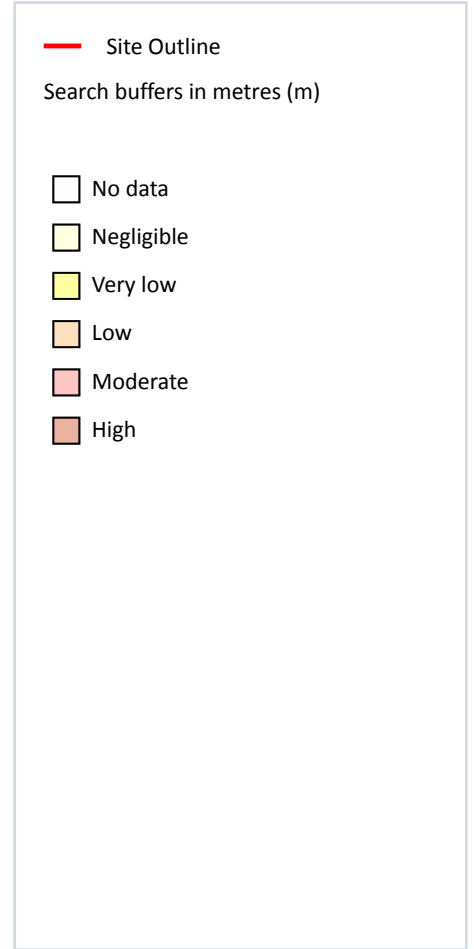
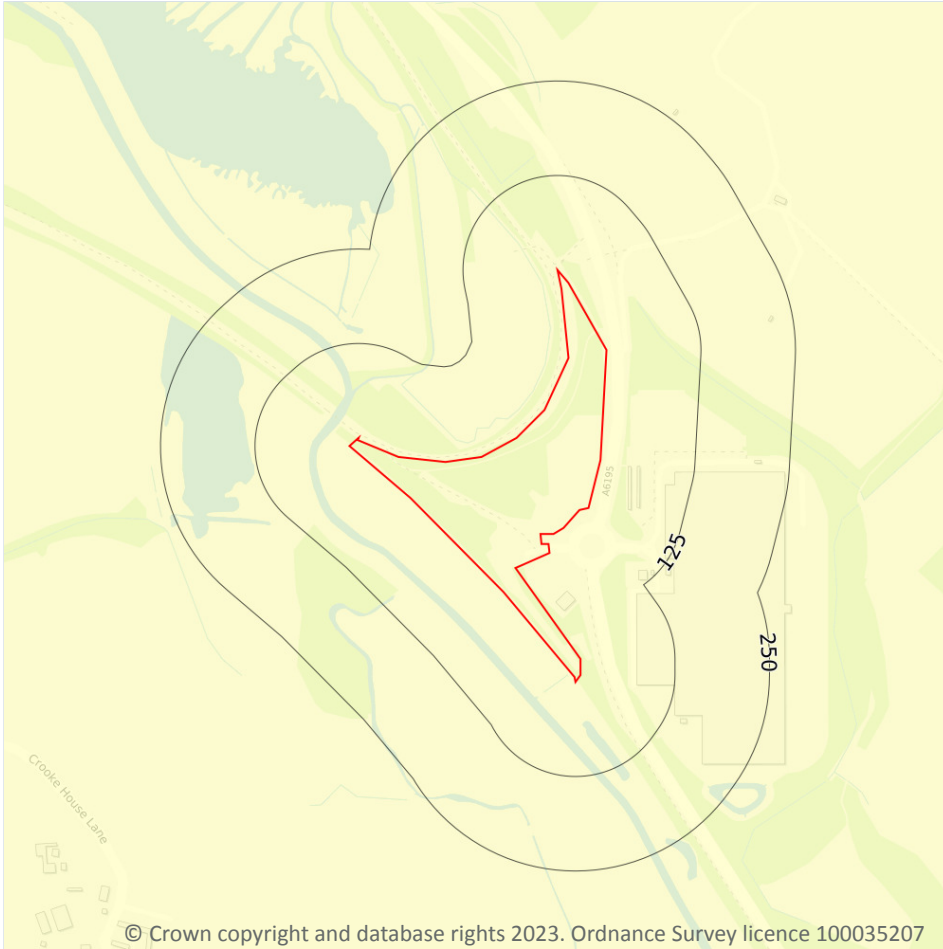
Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

Location	Hazard rating	Details
47m NE	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

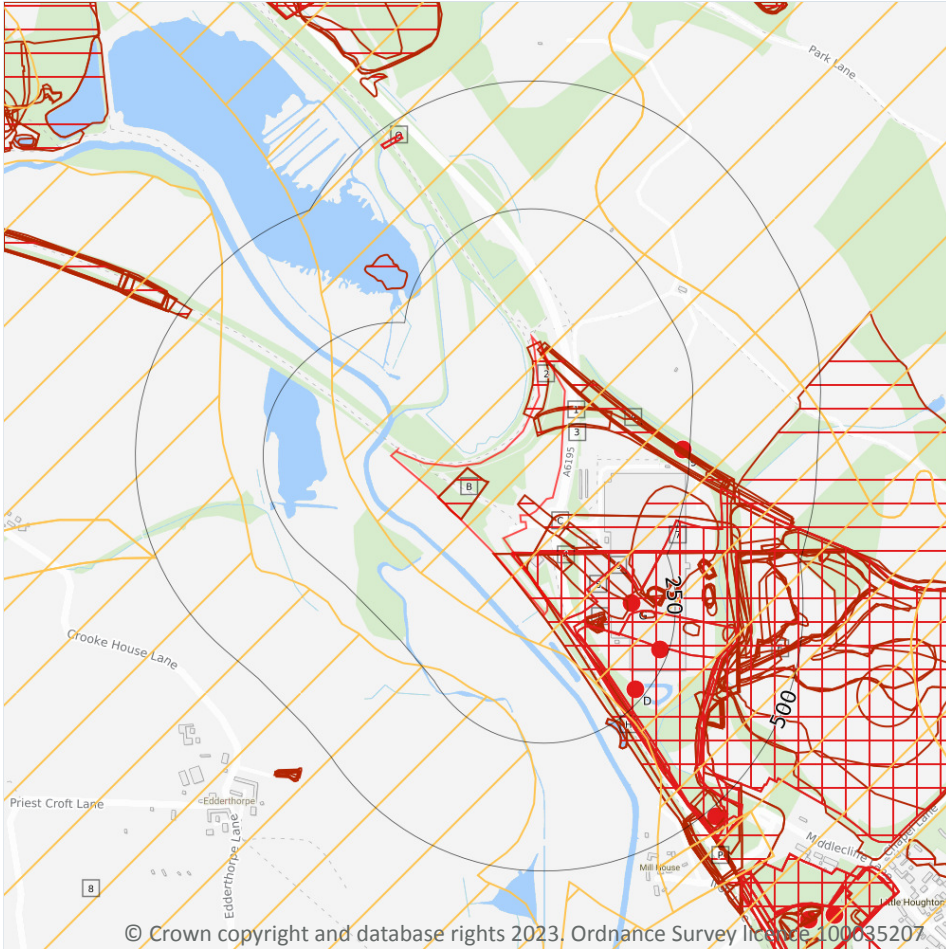
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 112**

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



18.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m

5

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining, ground workings and natural cavities map on **page 114**

ID	Location	Details	Description
G	164m SE	Name: Houghton Main Extension OCCS Address: BARNSELY, South Yorkshire Commodity: Coal, Surface Mined Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
D	229m SE	Name: Houghton Main Colliery Address: Little Houghton, BARNSELY, South Yorkshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
D	234m SE	Name: Houghton Main Colliery Shaft Address: Little Houghton, BARNSELY, South Yorkshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
9	235m E	Name: Houghton Main OCCS Address: BARNSELY, South Yorkshire Commodity: Coal, Surface Mined Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority



ID	Location	Details	Description
D	254m SE	Name: Houghton Main Colliery Shaft Address: Little Houghton, BARNSELY, South Yorkshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	46
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Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 114**

ID	Location	Land Use	Year of mapping	Mapping scale
1	On site	Cuttings	1988	1:10000
2	On site	Cuttings	1988	1:10000
A	On site	Cuttings	1955	1:10560
A	On site	Cuttings	1948	1:10560
A	On site	Cuttings	1904	1:10560
A	On site	Cuttings	1981	1:10000
A	On site	Cuttings	1938	1:10560
B	On site	Cuttings	1948	1:10560
B	On site	Cuttings	1904	1:10560
C	On site	Cuttings	1904	1:10560
D	On site	Colliery	1988	1:10000
D	On site	Colliery	1981	1:10000
D	On site	Colliery	1948	1:10560
D	On site	Colliery	1938	1:10560
D	On site	Colliery	1931	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
D	0m S	Colliery	1938	1:10560
D	0m S	Colliery	1938	1:10560
A	30m NE	Cuttings	1967	1:10560
E	37m S	Colliery	1955	1:10560
4	44m SE	Cuttings	1938	1:10560
5	51m SE	Cuttings	1904	1:10560
C	59m SE	Cuttings	1948	1:10560
D	61m SE	Colliery	1904	1:10560
D	73m SE	Colliery	1890	1:10560
F	77m SE	Unspecified Pit	1938	1:10560
F	77m SE	Unspecified Pit	1938	1:10560
F	78m SE	Unspecified Ground Workings	1955	1:10560
F	88m SE	Unspecified Pit	1948	1:10560
F	92m SE	Unspecified Ground Workings	1938	1:10560
F	92m SE	Unspecified Ground Workings	1931	1:10560
6	110m SE	Cuttings	1904	1:10560
7	173m E	Refuse Heap	1967	1:10560
G	185m SE	Unspecified Pit	1904	1:10560
G	195m SE	Unspecified Pit	1938	1:10560
G	195m SE	Unspecified Pit	1938	1:10560
G	196m SE	Unspecified Pit	1938	1:10560
G	196m SE	Unspecified Pit	1931	1:10560
G	197m SE	Unspecified Pit	1948	1:10560
G	197m SE	Unspecified Pit	1955	1:10560
G	231m SE	Cuttings	1938	1:10560
G	233m SE	Cuttings	1955	1:10560
G	234m SE	Cuttings	1948	1:10560
G	235m SE	Cuttings	1938	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
G	235m SE	Cuttings	1931	1:10560
H	238m SE	Pond	1988	1:10000
H	238m SE	Pond	1981	1:10000

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

13

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 114**

ID	Location	Land Use	Year of mapping	Mapping scale
D	On site	Colliery	1948	1:10560
E	37m S	Colliery	1951	1:10560
D	61m SE	Colliery	1904	1:10560
D	73m SE	Colliery	1890	1:10560
Q	463m N	Tunnel	1988	1:10000
Q	463m N	Tunnel	1981	1:10000
V	632m SE	Colliery	1951	1:10560
V	635m SE	Colliery	1938	1:10560
V	636m SE	Colliery	1904	1:10560
V	639m SE	Colliery	1988	1:10000
V	639m SE	Colliery	1981	1:10000
V	639m SE	Unspecified Mine	1967	1:10560
20	782m N	Colliery	1948	1:10560

This is data is sourced from Ordnance Survey/Groundsure.



18.5 Historical Mineral Planning Areas

Records within 500m

0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

6

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining, ground workings and natural cavities map on **page 114**

ID	Location	Name	Commodity	Class	Likelihood
3	On site	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
8	193m S	Sheffield Area	Iron Ore	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
10	266m NE	Sheffield Area	Iron Ore	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
16	504m W	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
P	536m SE	Sheffield Area	Iron Ore	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
24	983m NW	Sheffield Area	Iron Ore	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered



This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m

0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site

0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site

1

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site

0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.



18.11 Gypsum areas

Records on site	0
-----------------	---

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

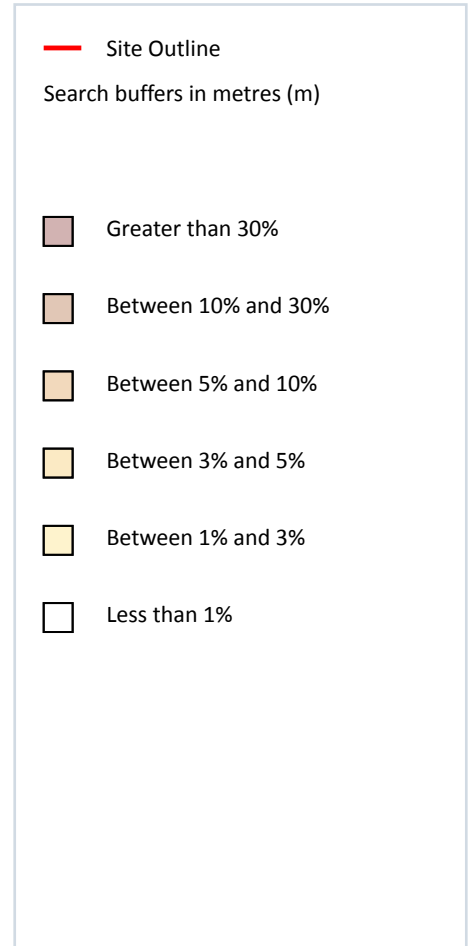
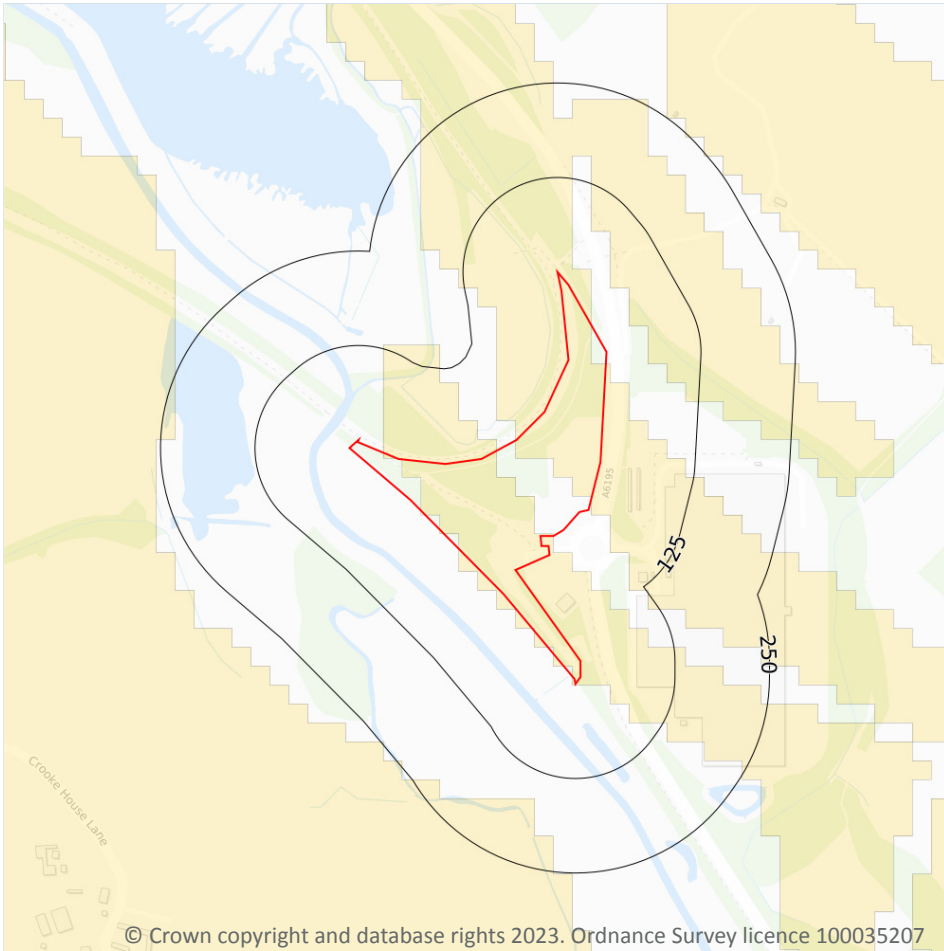
18.13 Clay mining

Records on site	0
-----------------	---

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



19.1 Radon

Records on site

2

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 122**

Location	Estimated properties affected	Radon Protection Measures required
On site	Between 1% and 3%	None



Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

This data is sourced from the British Geological Survey and UK Health Security Agency.



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

13

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
1m W	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
23m W	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg



Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
36m E	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m

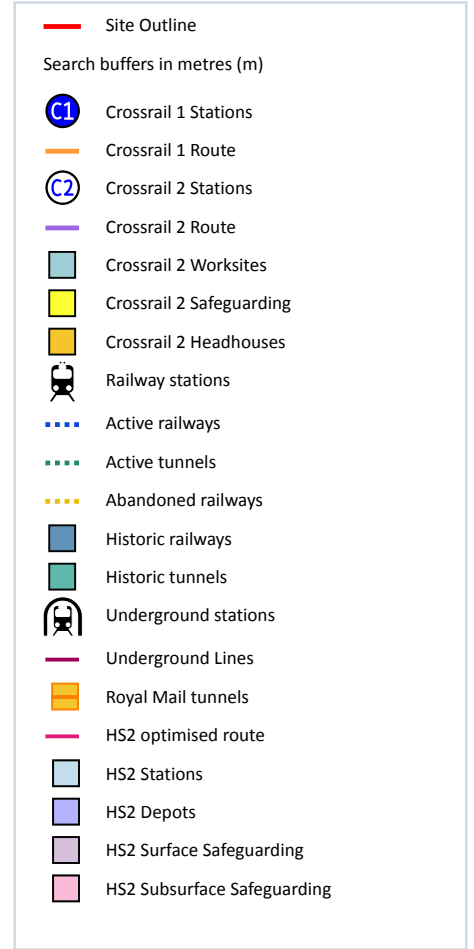
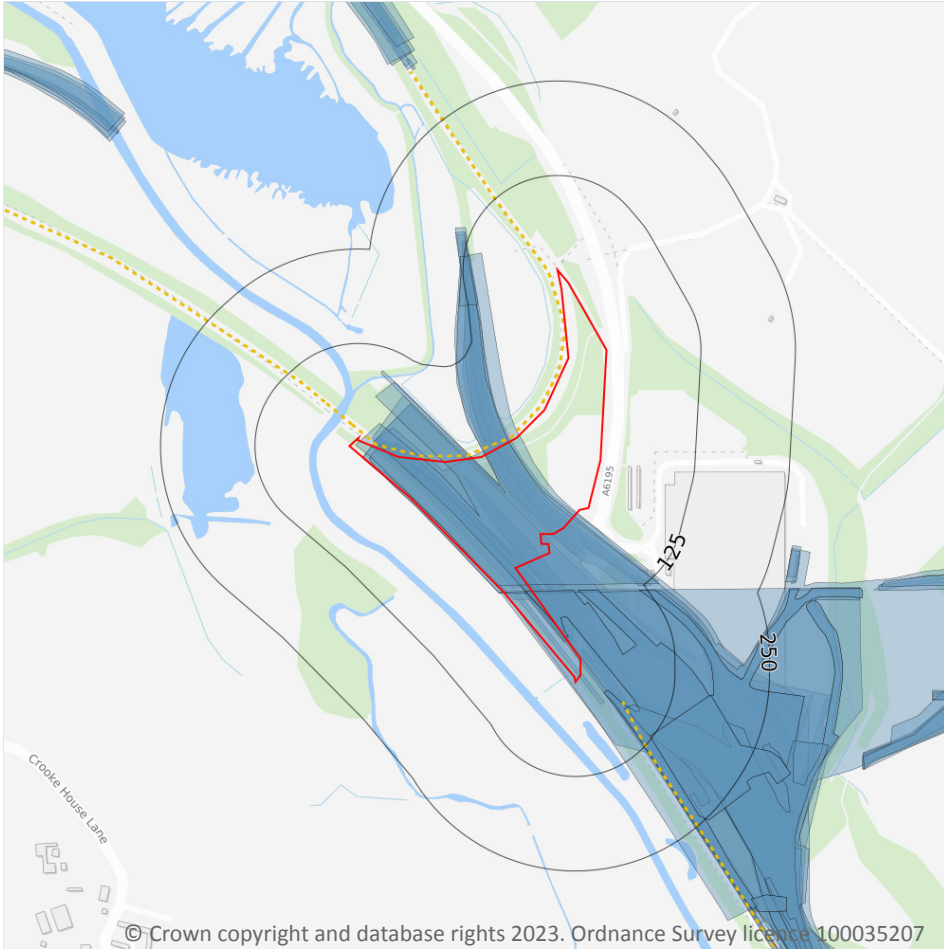
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The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



21 Railway infrastructure and projects



21.1 Underground railways (London)

Records within 250m

0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m

0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m

27

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 126**

Location	Land Use	Year of mapping	Mapping scale
On site	Railway Sidings	1980	2500
On site	Railway Sidings	1961	2500
On site	Railway Sidings	1983	2500
On site	Railway Sidings	1890	2500
On site	Railway Sidings	1906	2500
On site	Railway Sidings	1893	2500
On site	Railway Sidings	1931	2500
On site	Mineral Railway Sidings	1931	2500
On site	Railway Sidings	1948	10560
On site	Railway Sidings	1904	10560
On site	Railway Sidings	1890	10560
On site	Mineral Railway Sidings	1948	10560
On site	Mineral Railway Sidings	1967	10560
On site	Mineral Railway Sidings	1955	10560
On site	Mineral Railway Sidings	1938	10560
On site	Railway Sidings	1938	10560
On site	Railway Sidings	1931	10560



Location	Land Use	Year of mapping	Mapping scale
15m S	Railway Sidings	1906	2500
53m SE	Railway Sidings	1906	2500
65m SE	Railway Sidings	1890	2500
73m SE	Railway Sidings	1890	10560
112m N	Railway Sidings	1904	10560
122m SE	Railway Sidings	1988	10000
122m SE	Railway Sidings	1981	10000
148m SE	Railway Sidings	1980	2500
148m SE	Railway Sidings	1983	2500
239m SE	Railway Sidings	1961	2500

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m

0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m

4

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

Features are displayed on the Railway infrastructure and projects map on **page 126**

Location	Description
0m N	Dismantled
20m W	Dismantled
62m W	Dismantled



Location	Description
66m SE	Abandoned

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m **0**

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m **0**

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m **0**

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m **0**

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

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Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: County Series

Map date: 1854

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
 Revised N/A
 Edition 1854
 Copyright N/A
 Levelled N/A

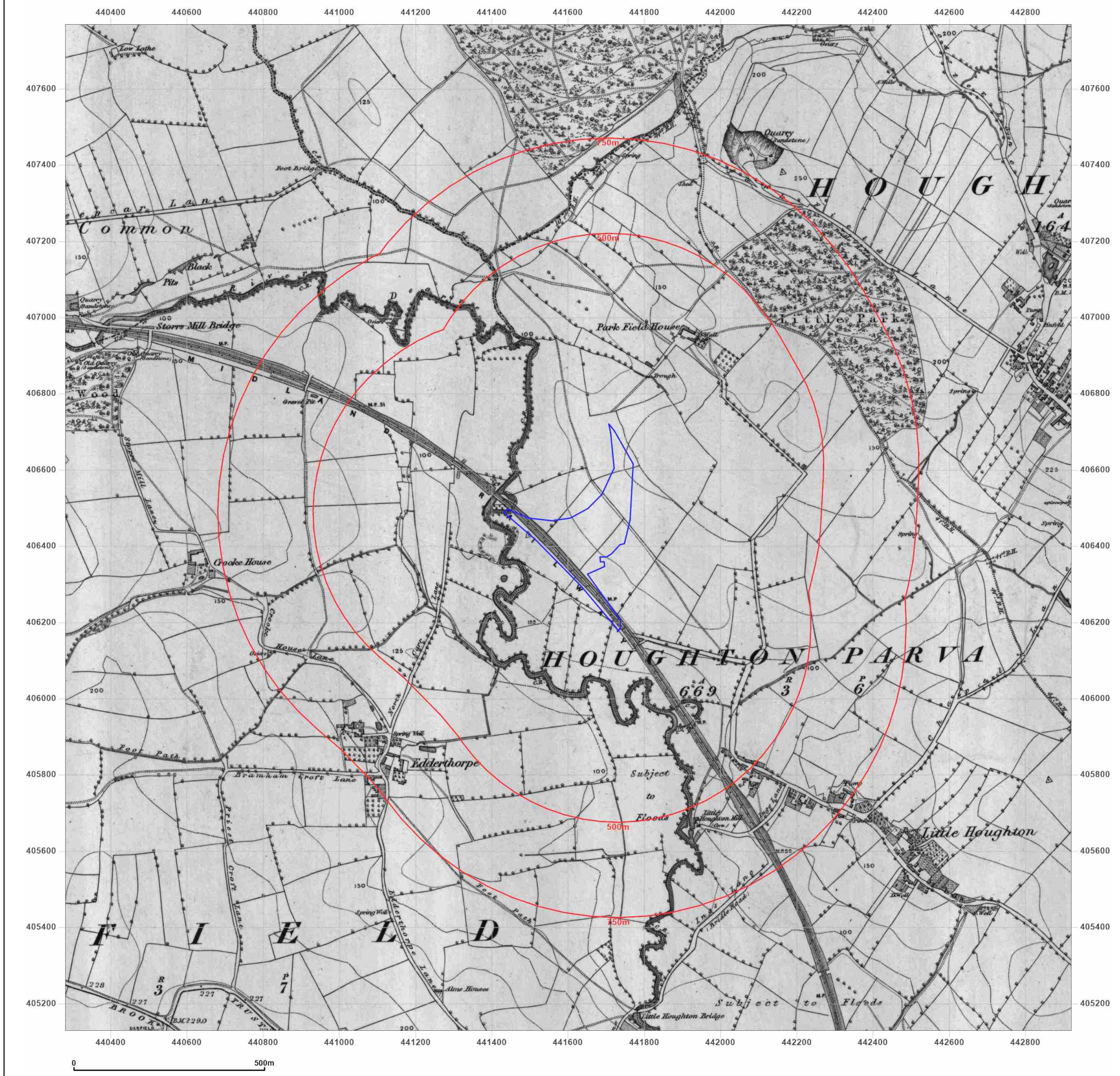


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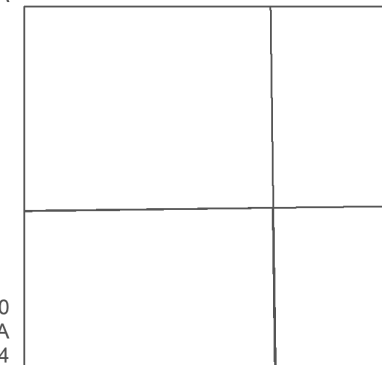
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Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1890
 Revised N/A
 Edition 1894
 Copyright N/A
 Levelled N/A



Surveyed 1890
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 Edition 1894
 Copyright N/A
 Levelled N/A

Surveyed 1890
 Revised 1890
 Edition N/A
 Copyright N/A
 Levelled N/A

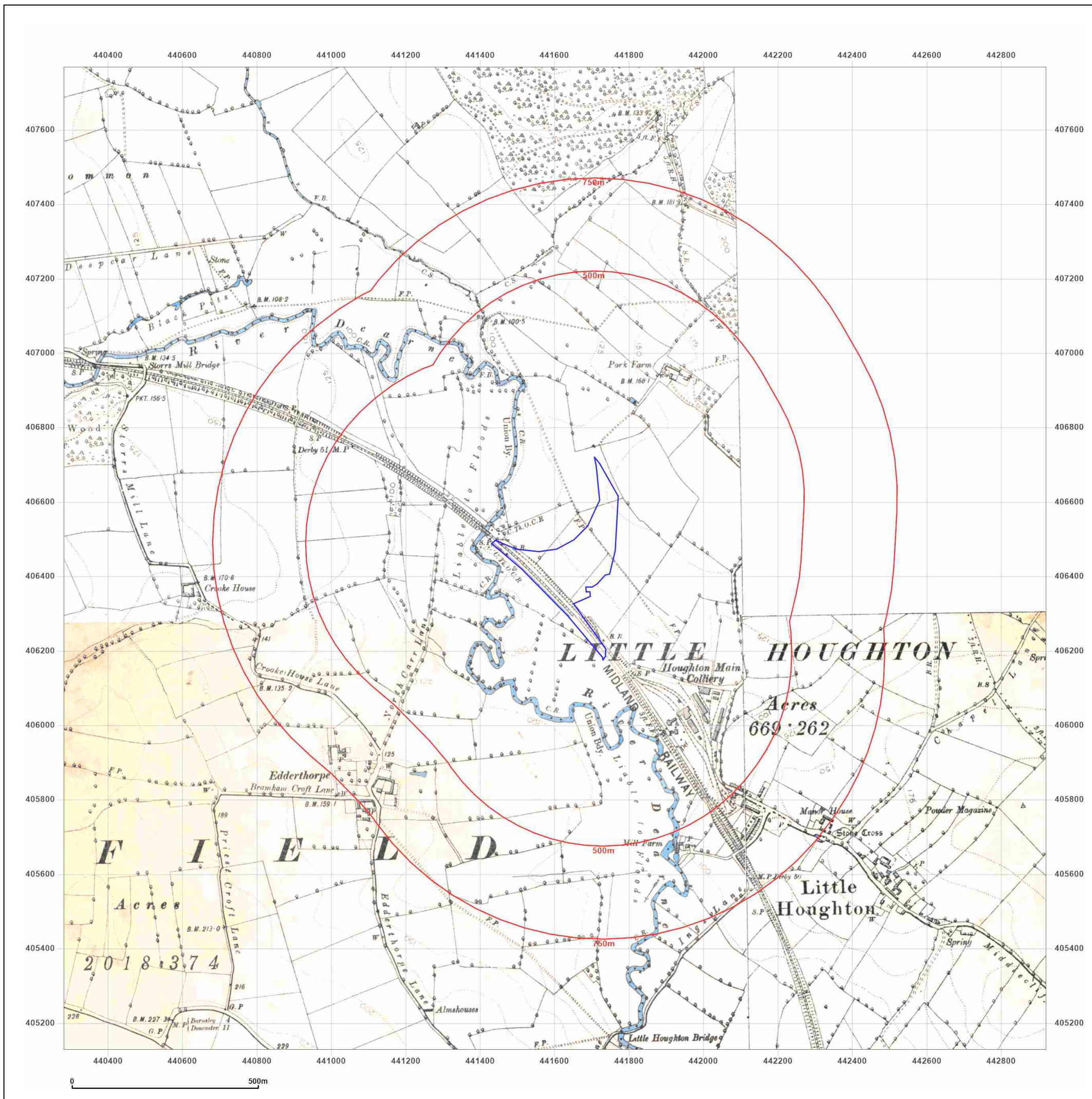


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Map Name: County Series

Map date: 1904

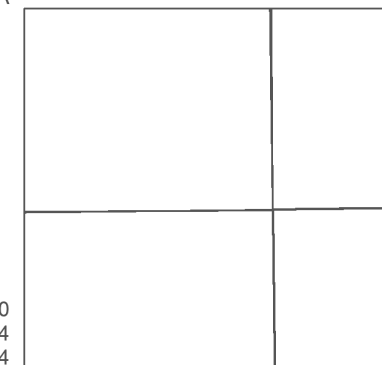
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Printed at: 1:10,560



Surveyed 1890
 Revised 1904
 Edition 1904
 Copyright N/A
 Levelled N/A

Surveyed 1891
 Revised 1904
 Edition 1904
 Copyright N/A
 Levelled N/A



Surveyed 1890
 Revised 1904
 Edition 1904
 Copyright N/A
 Levelled N/A

Surveyed 1890
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A

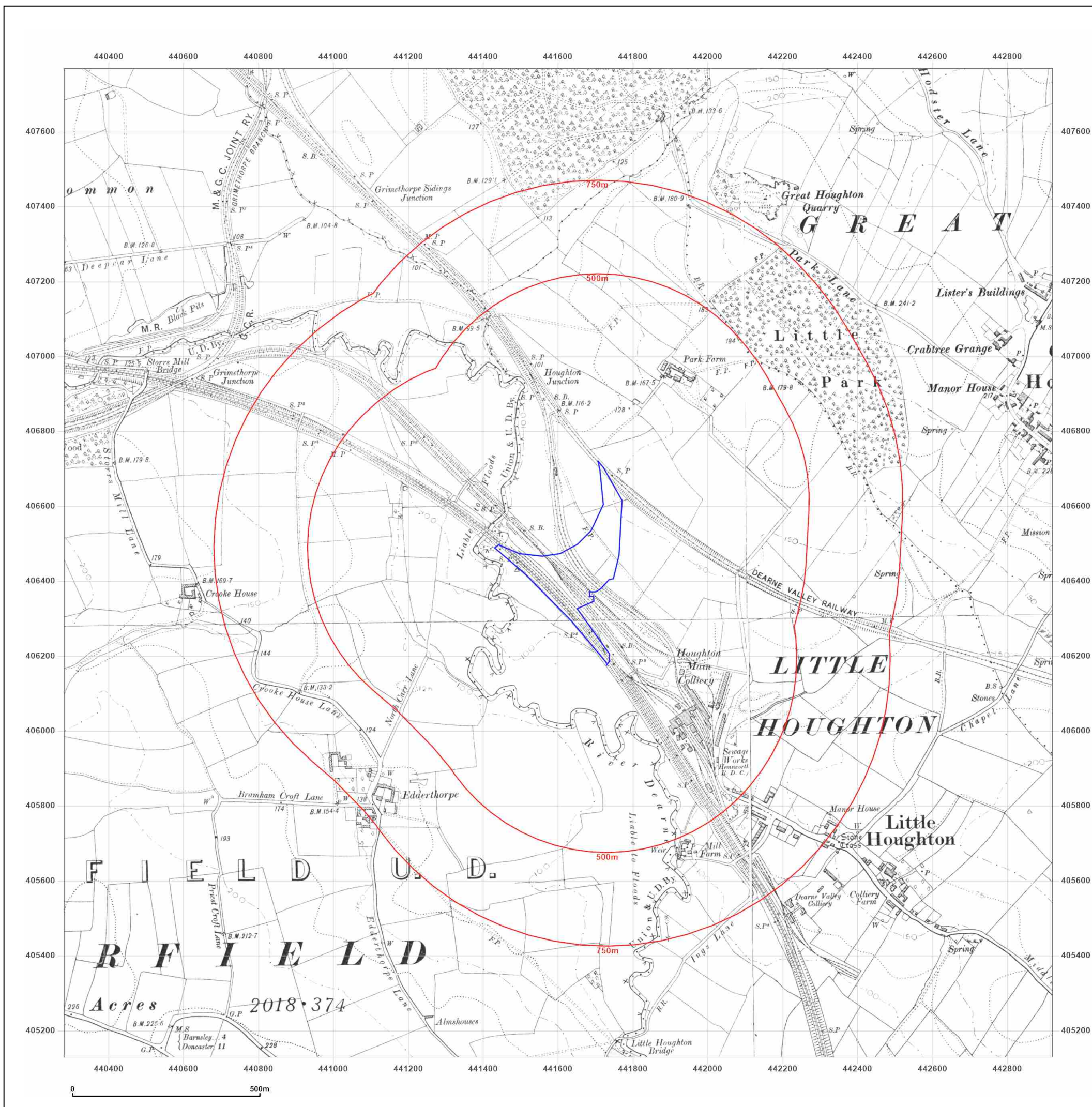


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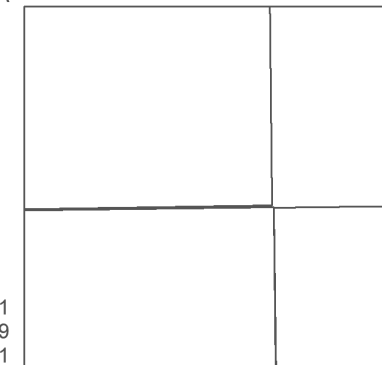
Map date: 1929-1932

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
 Revised 1930
 Edition 1932
 Copyright N/A
 Levelled N/A



Surveyed 1851
 Revised 1929
 Edition 1931
 Copyright N/A
 Levelled N/A

Surveyed 1850
 Revised 1929
 Edition N/A
 Copyright N/A
 Levelled N/A

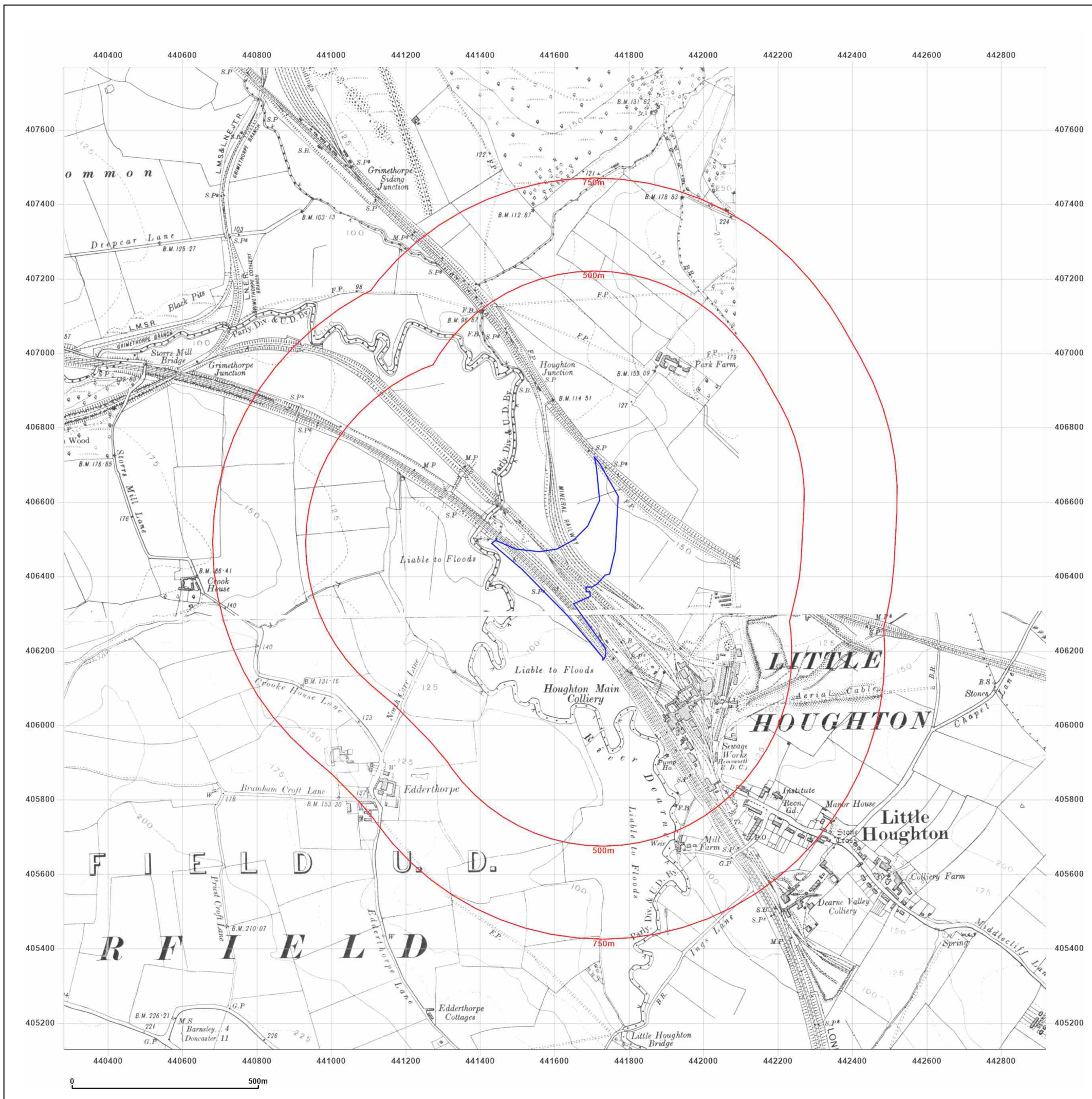


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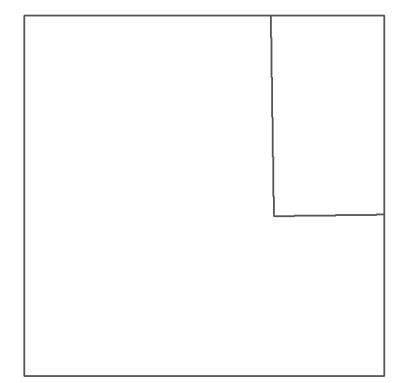
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Printed at: 1:10,560



Surveyed 1850
 Revised 1932
 Edition 1932
 Copyright N/A
 Levelled 1929

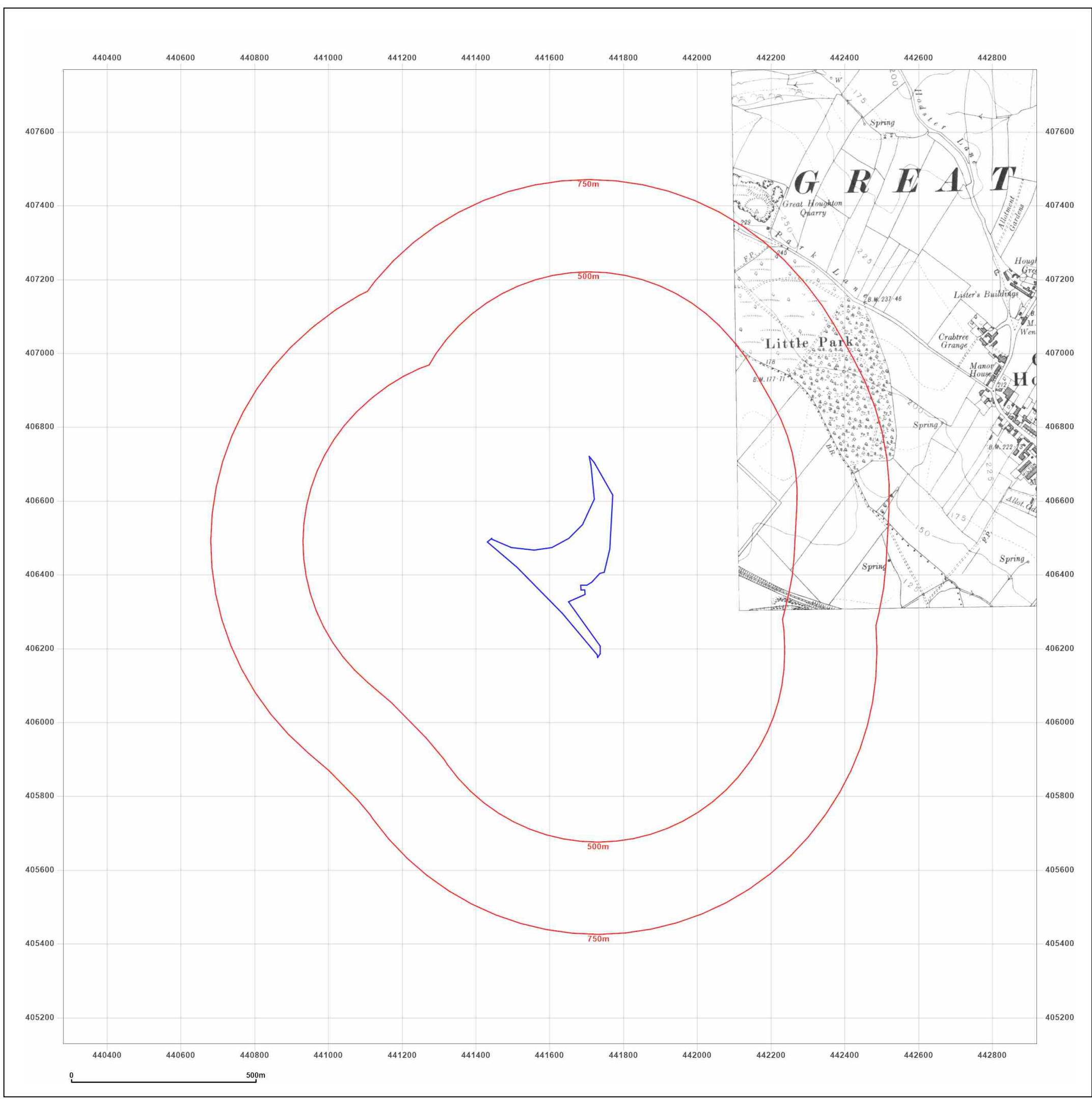


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Map Name: County Series

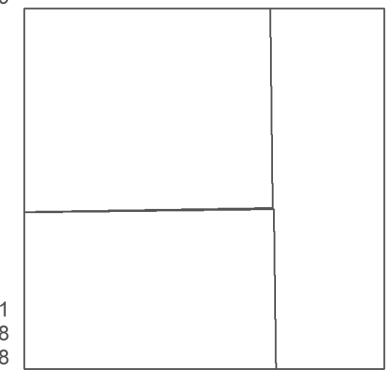
Map date: 1938

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Surveyed 1850
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled 1929



Surveyed 1851
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled 1929

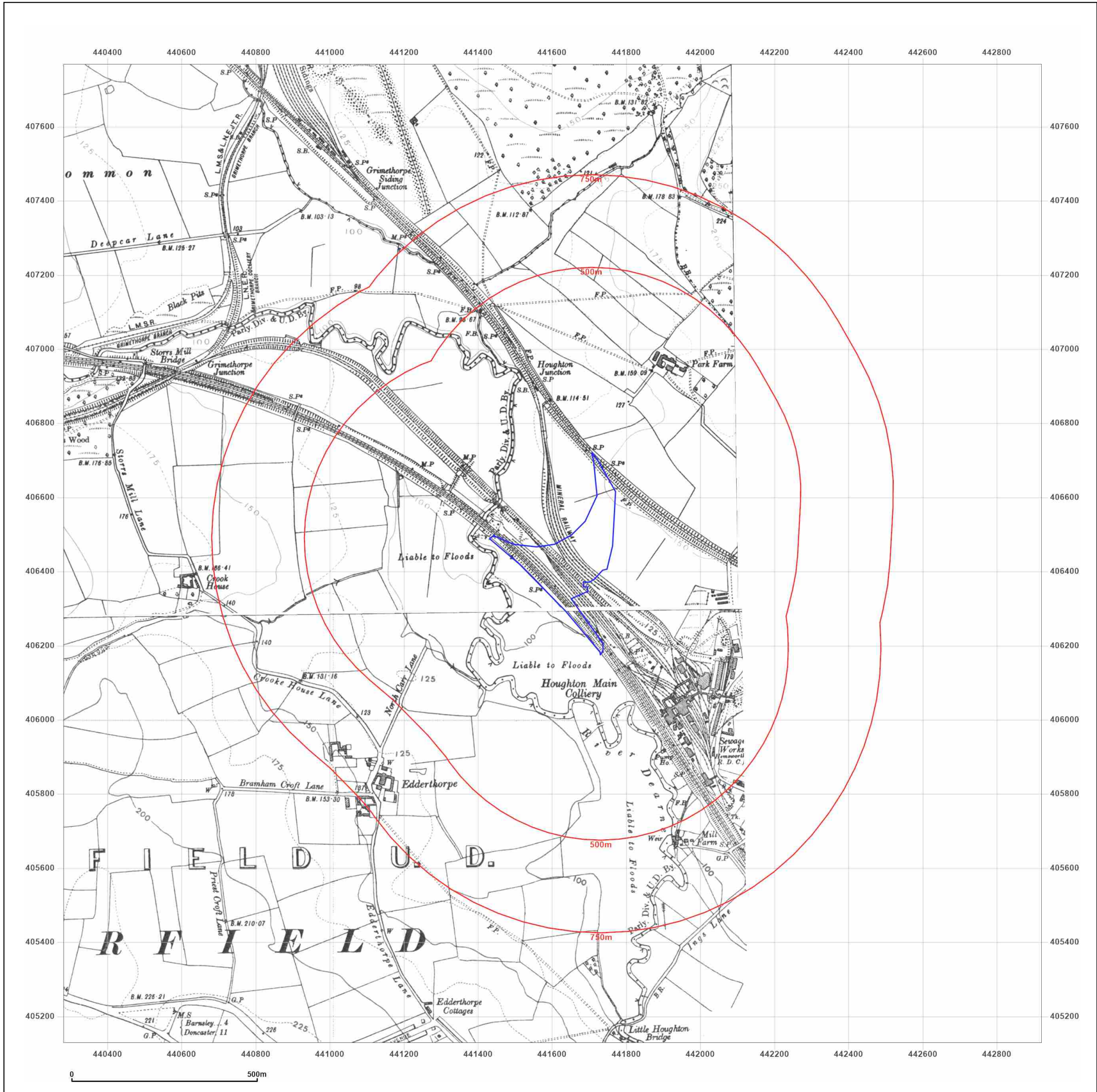


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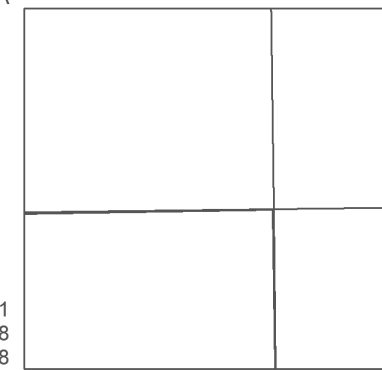
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Printed at: 1:10,560



Surveyed 1850
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A



Surveyed 1851
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A

Surveyed 1850
 Revised 1939
 Edition N/A
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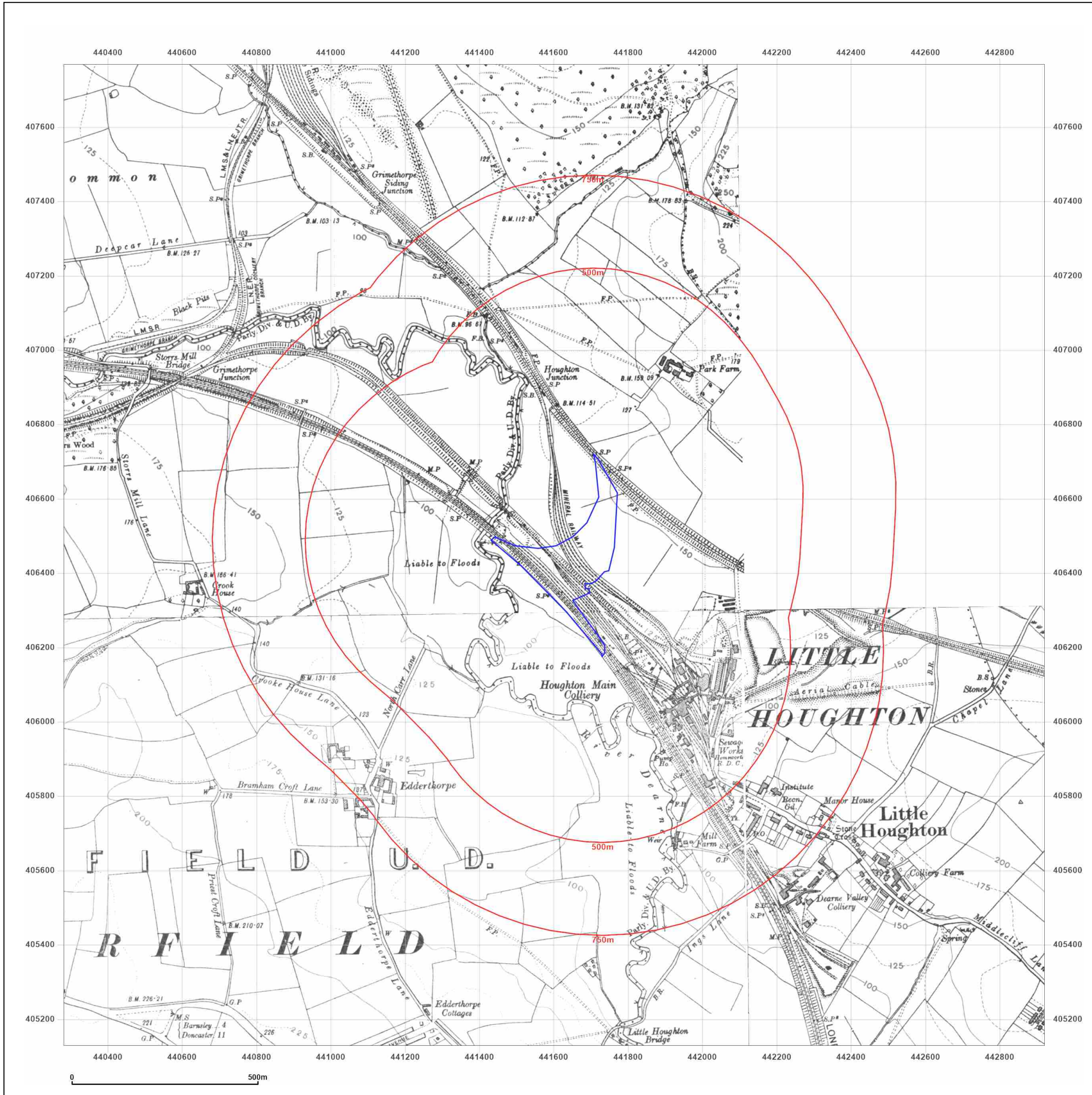


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Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: County Series

Map date: 1948-1949

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
 Revised 1948
 Edition 1948
 Copyright N/A
 Levelled 1929

Surveyed 1850
 Revised 1949
 Edition 1949
 Copyright N/A
 Levelled 1929

Surveyed 1851
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 Edition 1948
 Copyright N/A
 Levelled 1929

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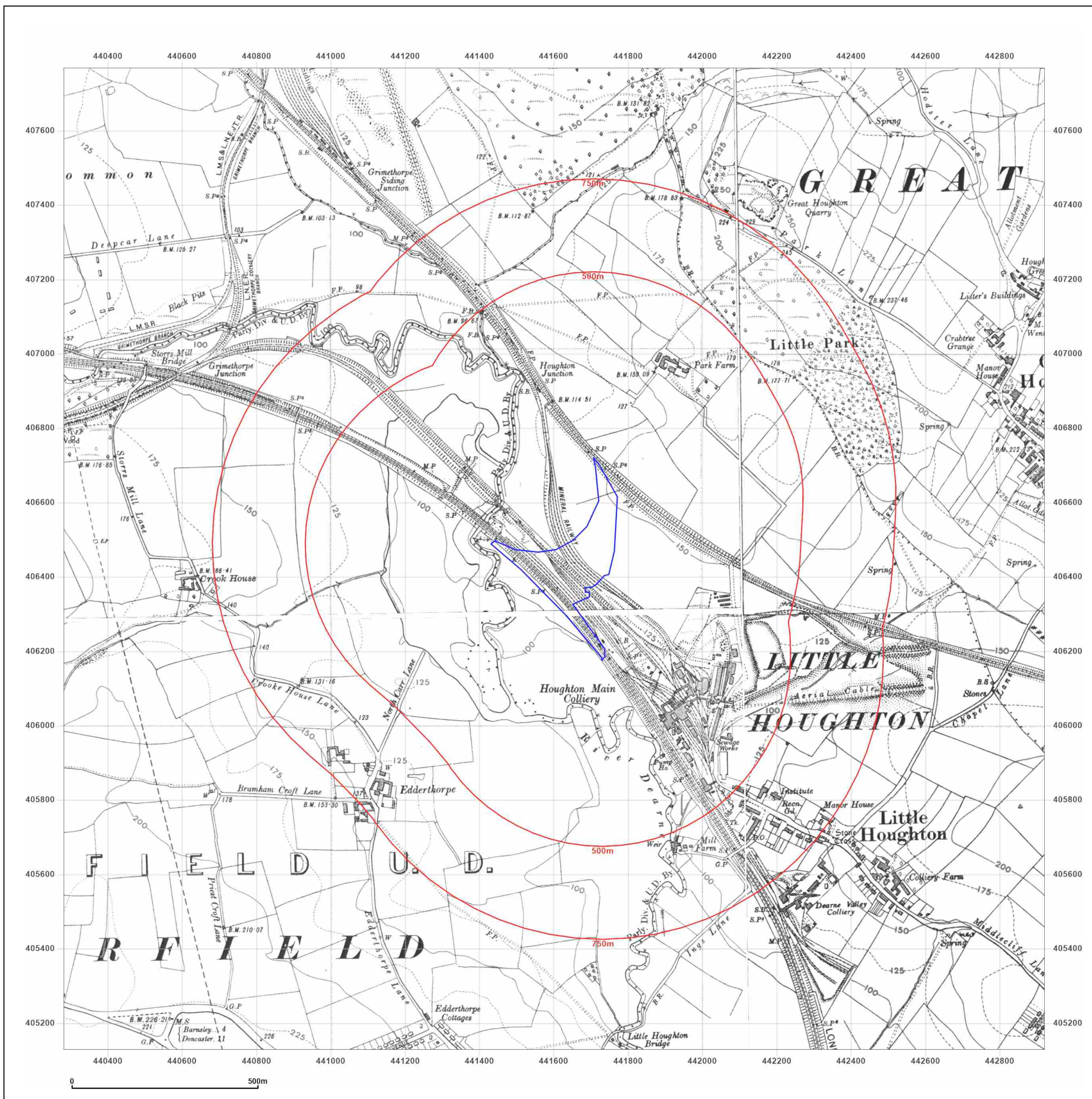


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Client Ref: Grid_Powr
Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: Provisional

Map date: 1955

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1951
 Revised 1955
 Edition N/A
 Copyright N/A
 Levelled N/A

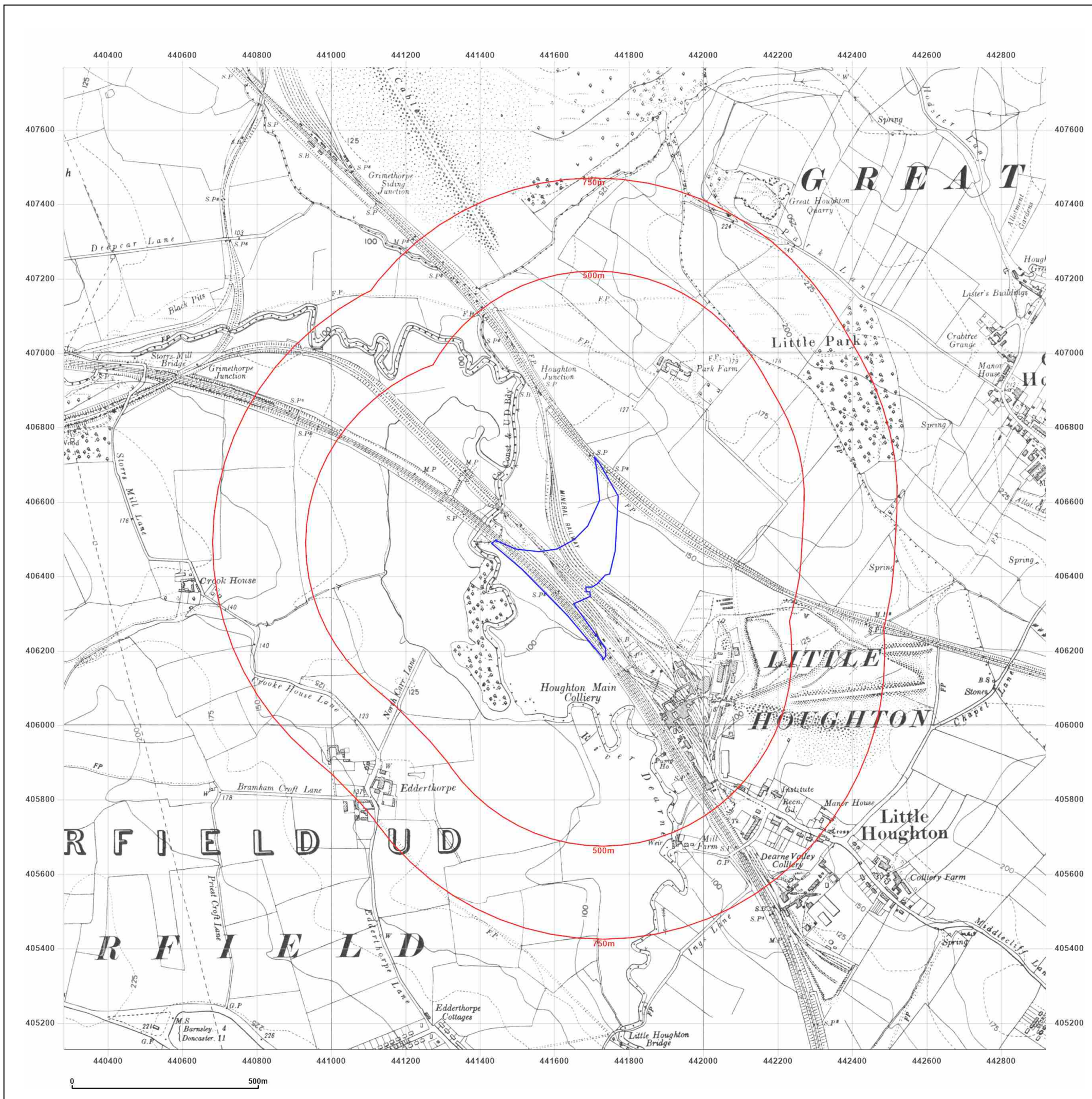


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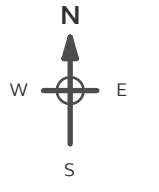
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Map Name: Provisional

Map date: 1967

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Printed at: 1:10,560



Surveyed 1967
 Revised 1967
 Edition N/A
 Copyright 1967
 Levelled N/A

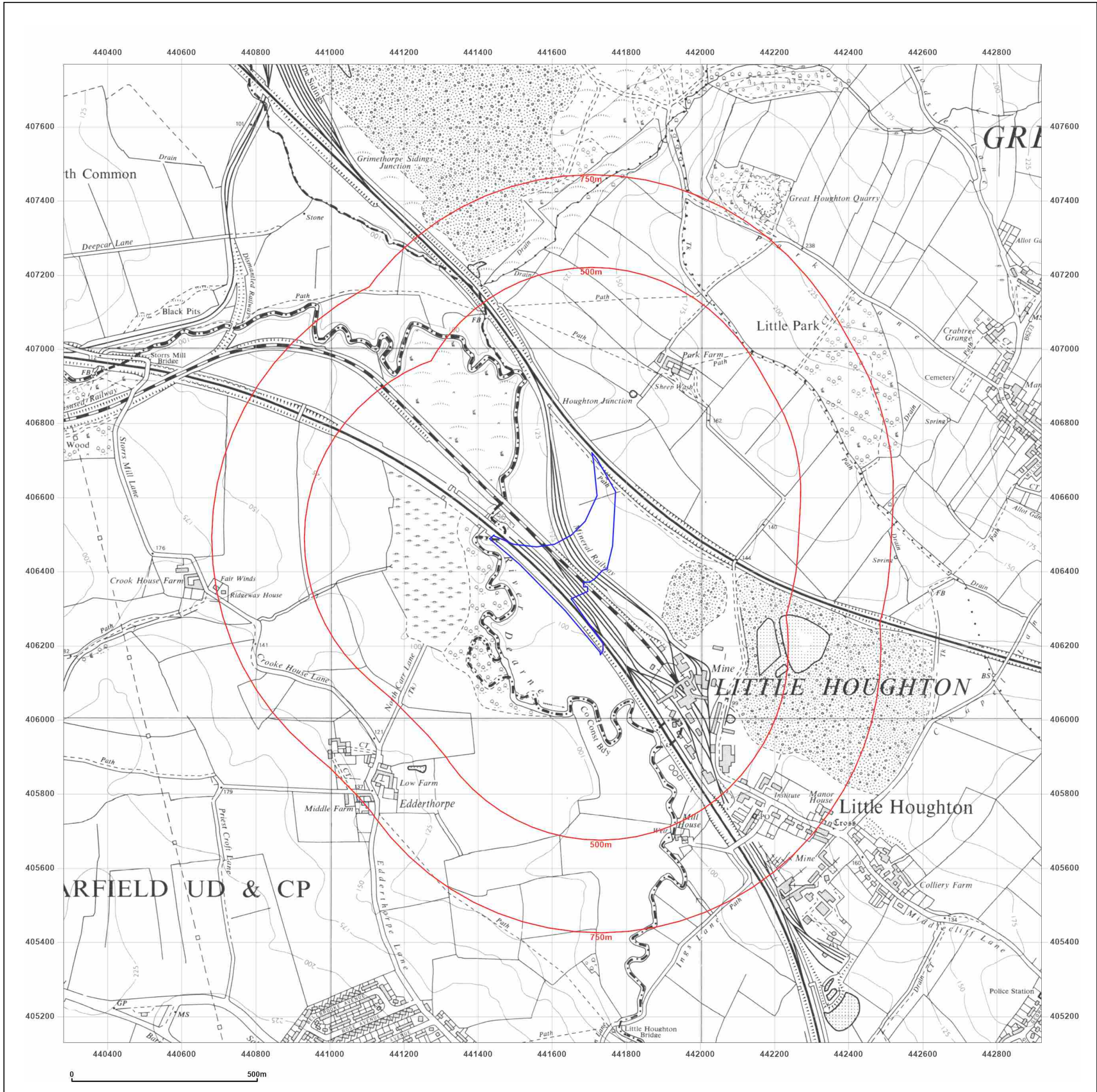


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Client Ref: Grid_Powr
Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: National Grid

Map date: 1981

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1980
 Revised 1981
 Edition N/A
 Copyright 1982
 Levelled 1978

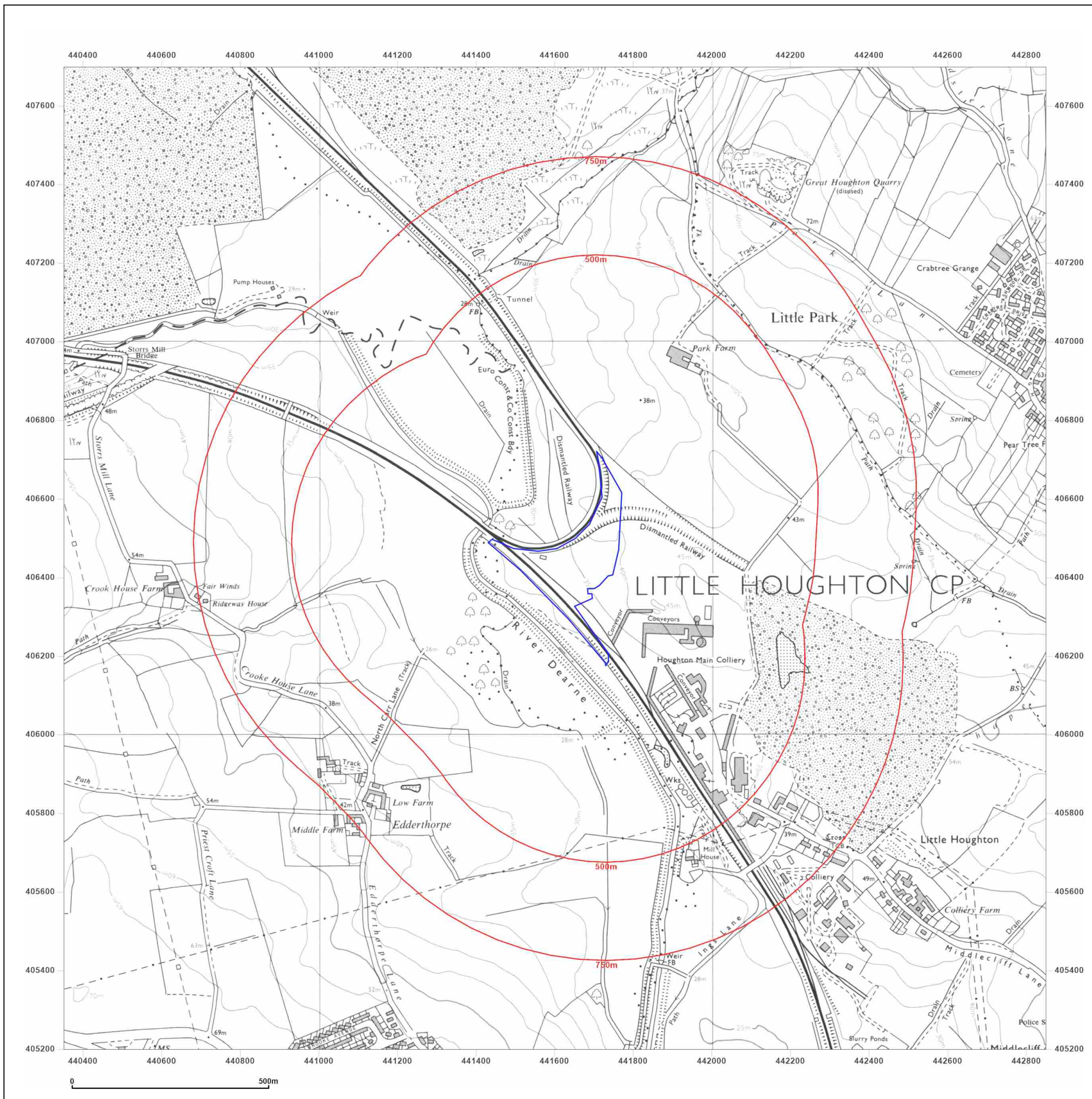


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Client Ref: Grid_Powr
Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: National Grid

Map date: 1988

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1987
 Revised 1988
 Edition N/A
 Copyright 1989
 Levelled 1978

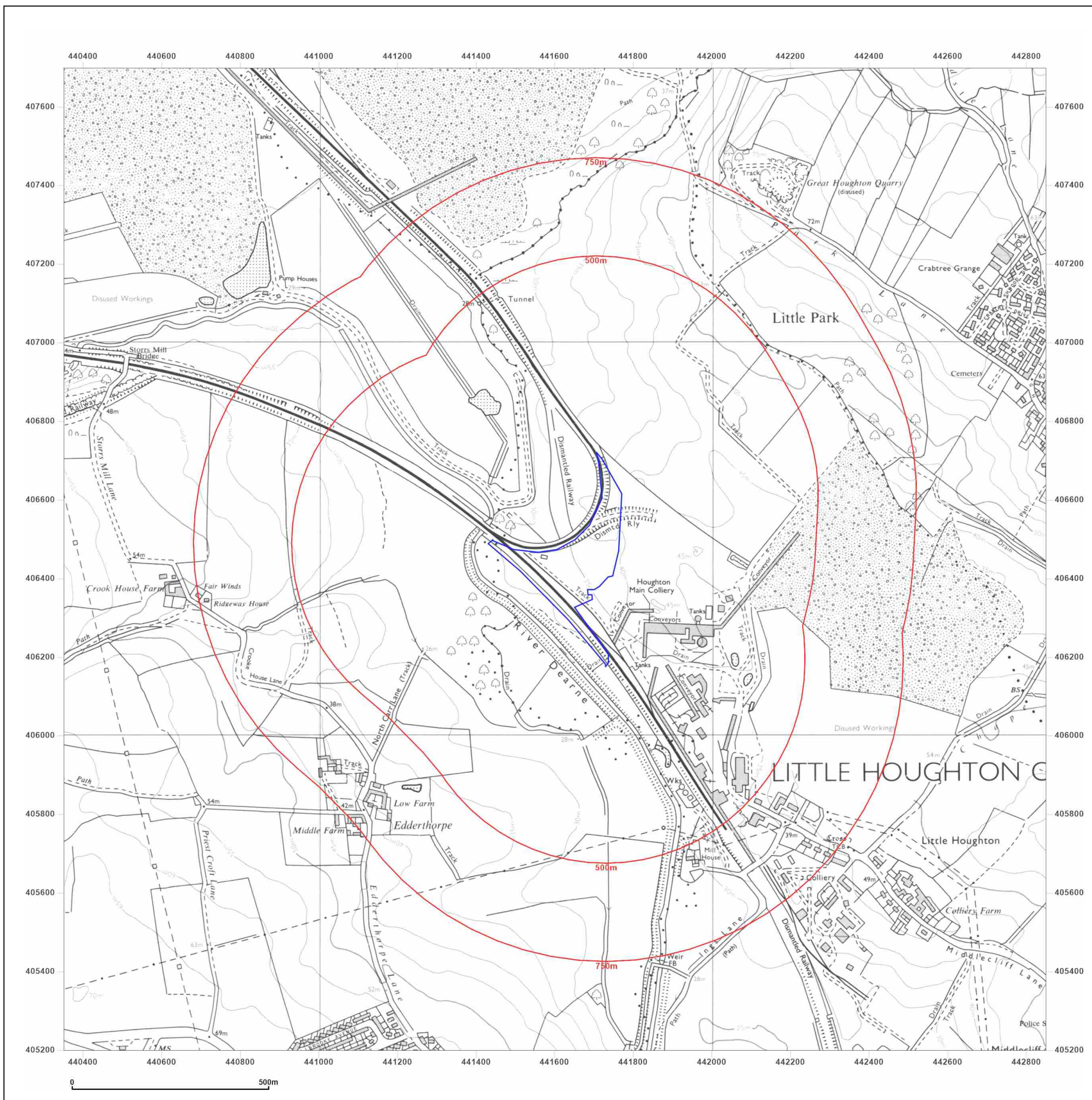


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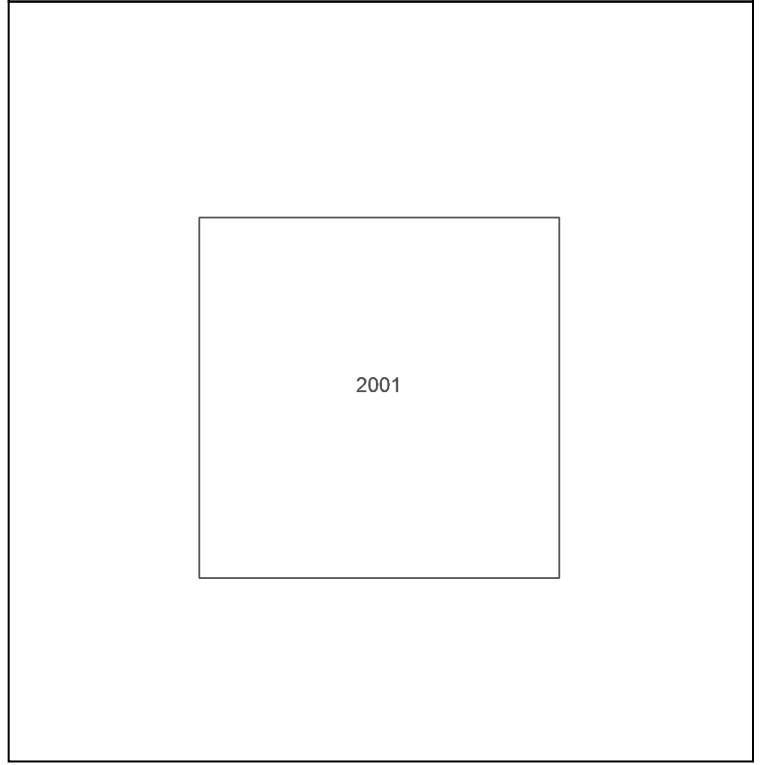
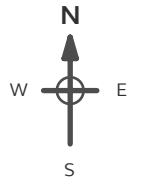
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 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: National Grid
Map date: 2001
Scale: 1:10,000
Printed at: 1:10,000



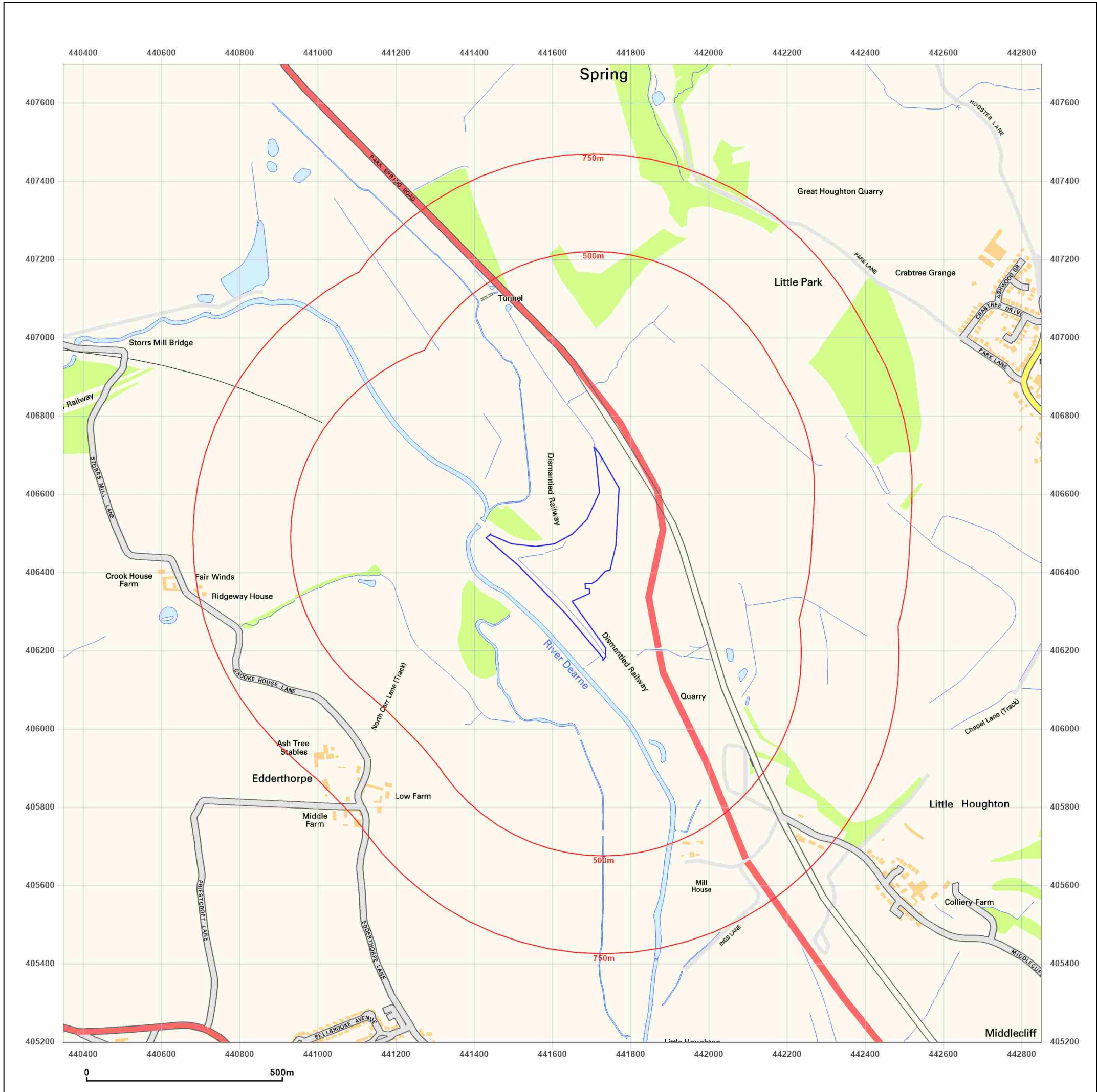
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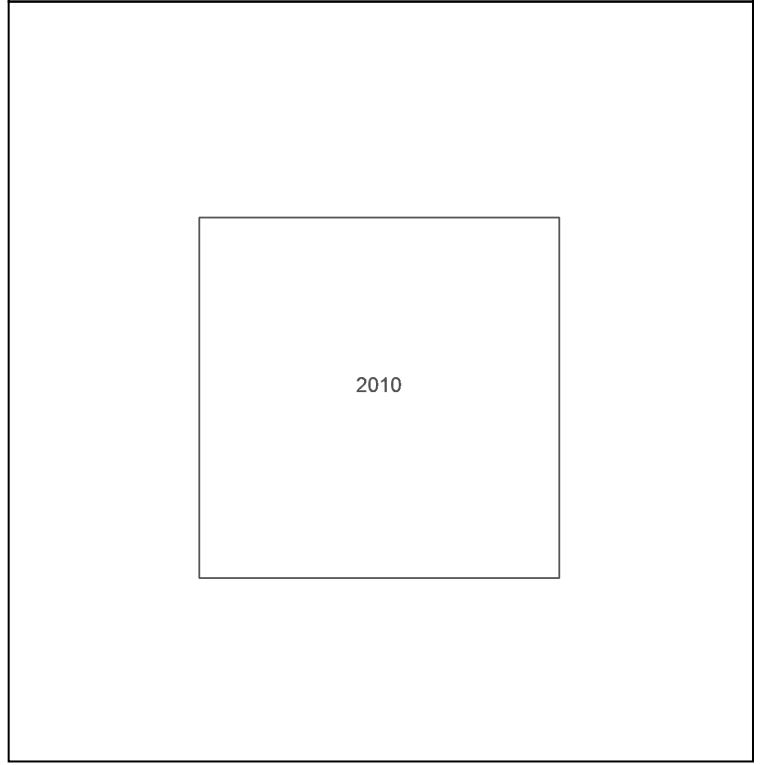
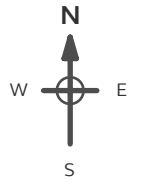
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www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:
 CAR PARK, ASOS, PARK
 SPRING ROAD, LITTLE
 HOUGHTON, BARNSELY, S72
 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: National Grid
Map date: 2010
Scale: 1:10,000
Printed at: 1:10,000



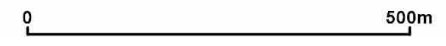
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Production date: 02 March 2023

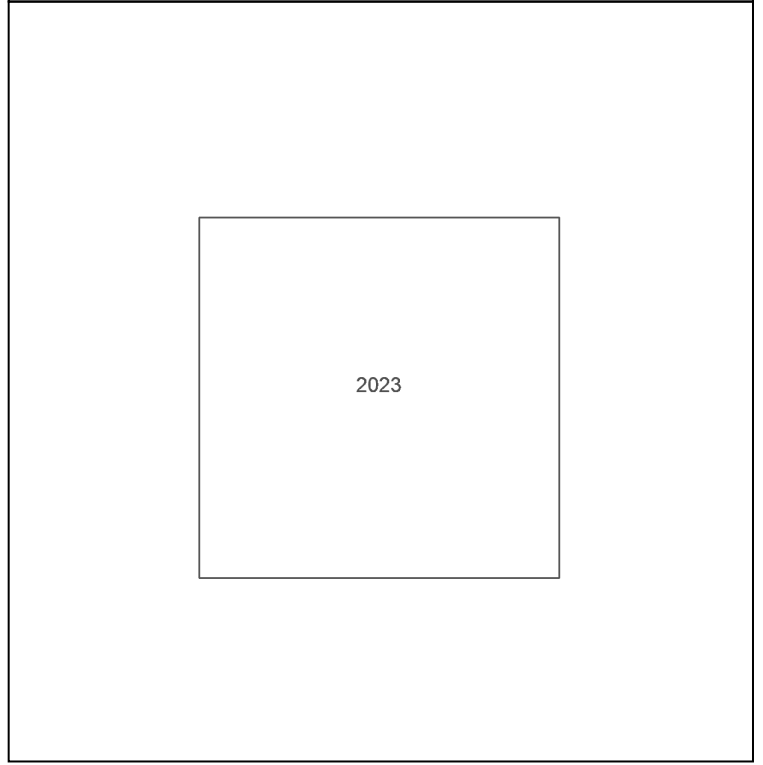
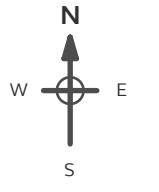
Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:
 CAR PARK, ASOS, PARK SPRING ROAD, LITTLE HOUGHTON, BARNSELY, S72 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714
Grid Ref: 441600, 406448

Map Name: National Grid
Map date: 2023
Scale: 1:10,000
Printed at: 1:10,000



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Site Details:

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 HOUGHTON, BARNSELY, S72
 7GX

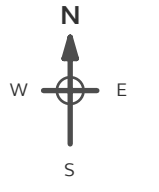
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Map Name: County Series

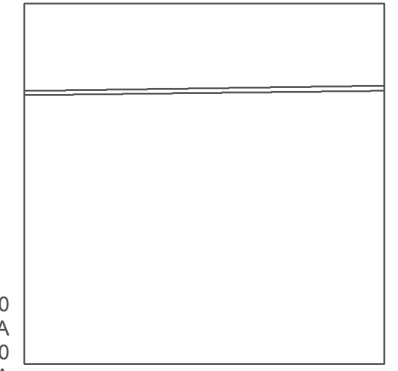
Map date: 1890-1893

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1893
 Revised N/A
 Edition 1893
 Copyright N/A
 Levelled N/A



Surveyed 1890
 Revised N/A
 Edition 1890
 Copyright N/A
 Levelled N/A

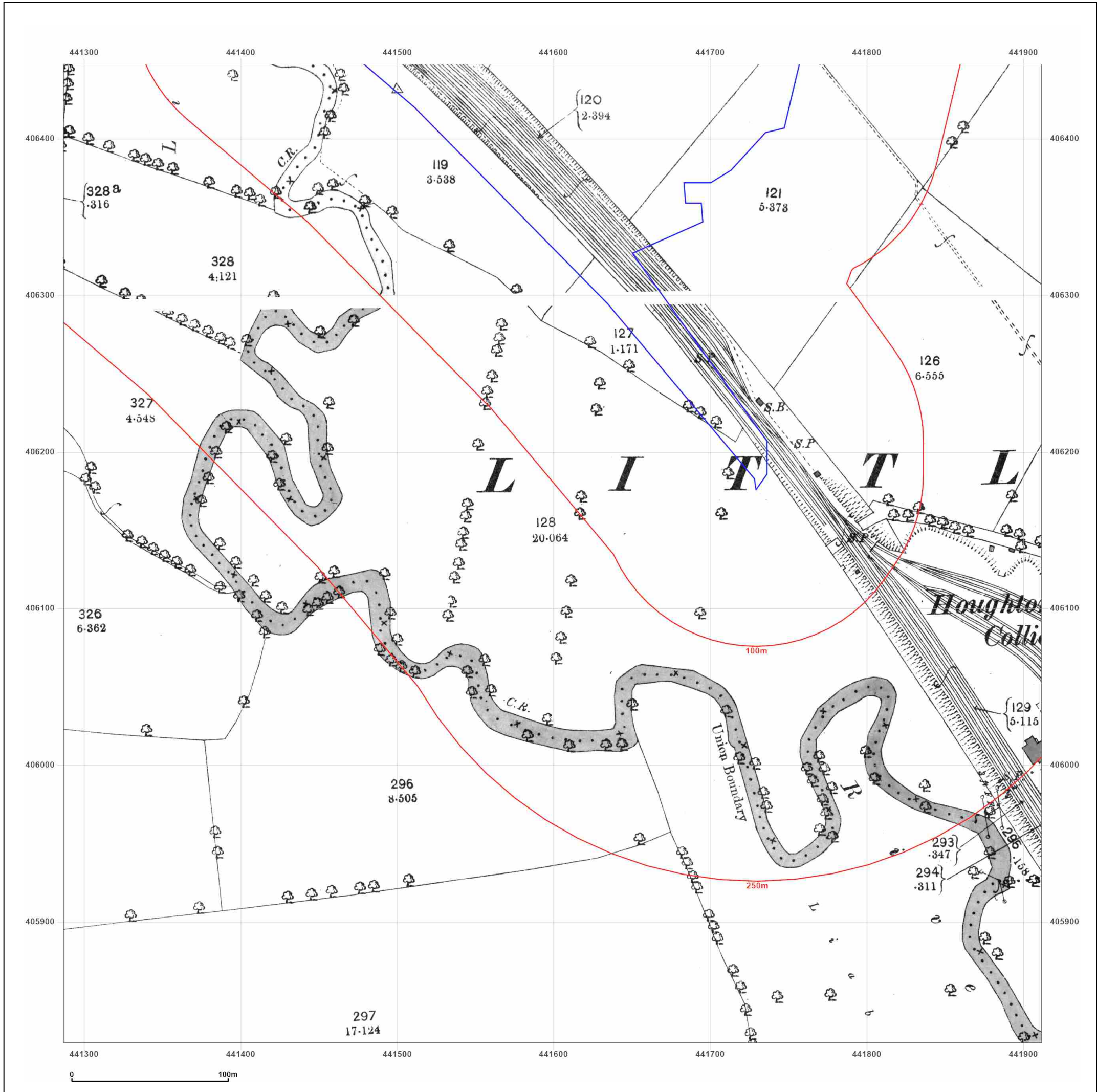


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 7GX

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Report Ref: GS-9391714_LS_1_1
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Map Name: County Series

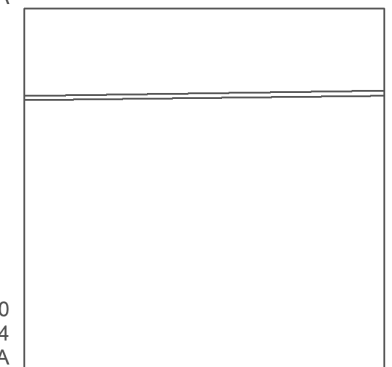
Map date: 1906

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1890
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1890
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A

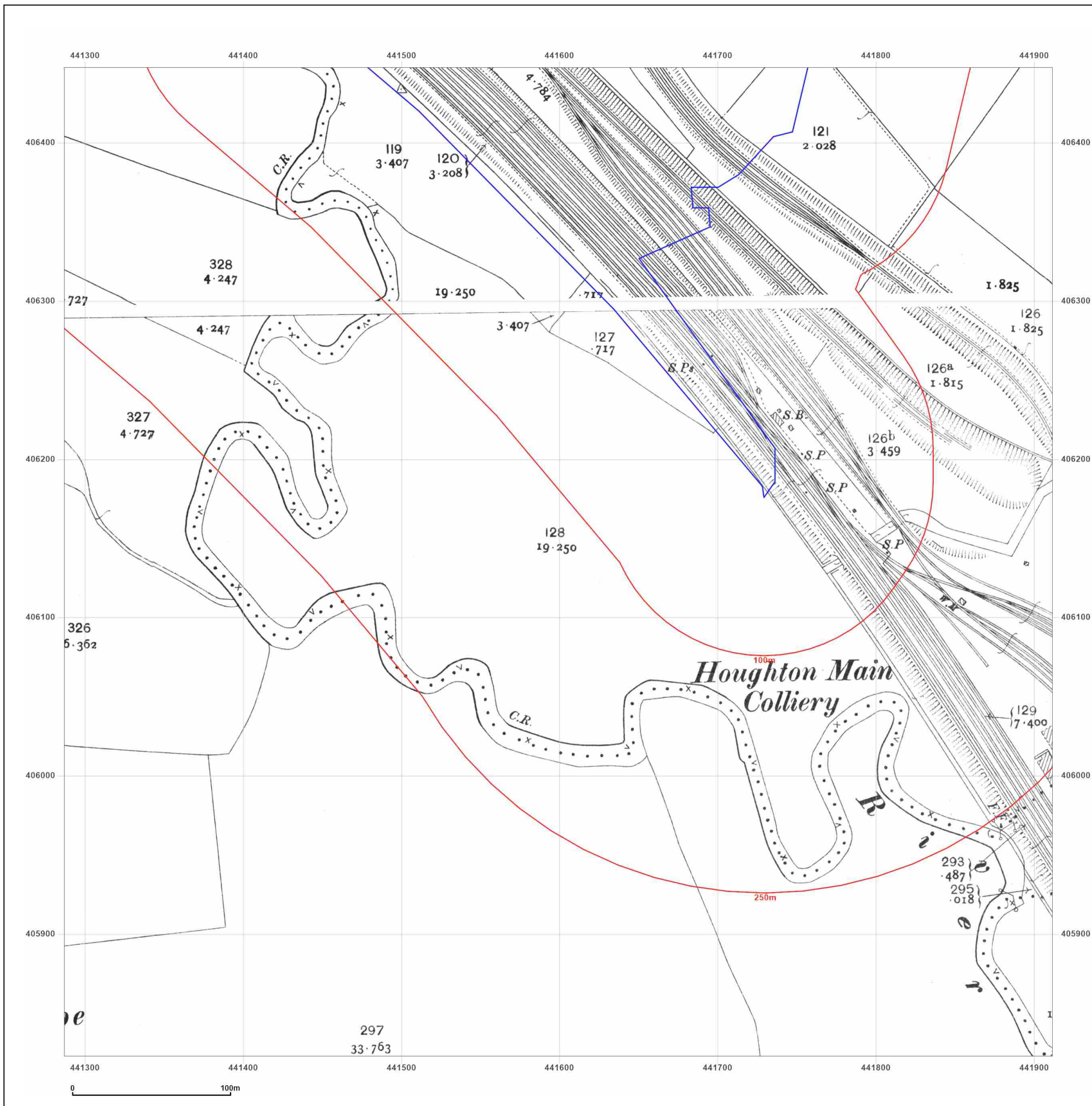


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 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_1
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Map Name: County Series

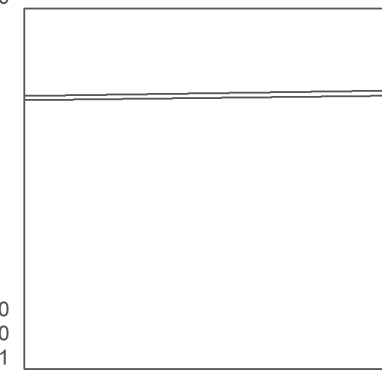
Map date: 1931

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1890
 Revised 1930
 Edition 1931
 Copyright N/A
 Levelled 1930



Surveyed 1890
 Revised 1930
 Edition 1931
 Copyright N/A
 Levelled 1930

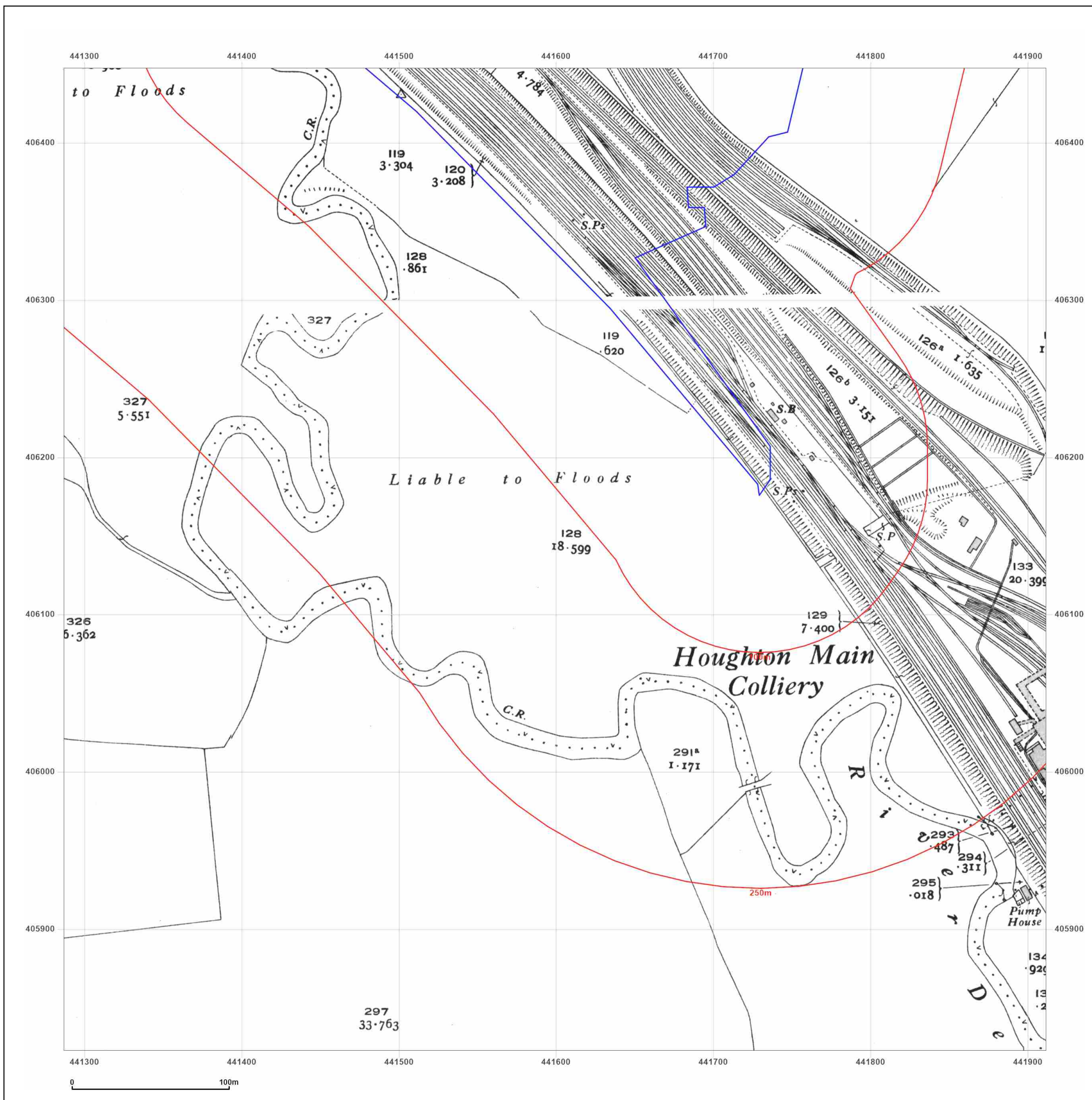


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 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_1
Grid Ref: 441599, 406135

Map Name: National Grid

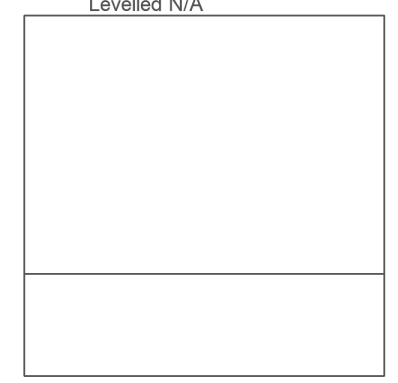
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Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

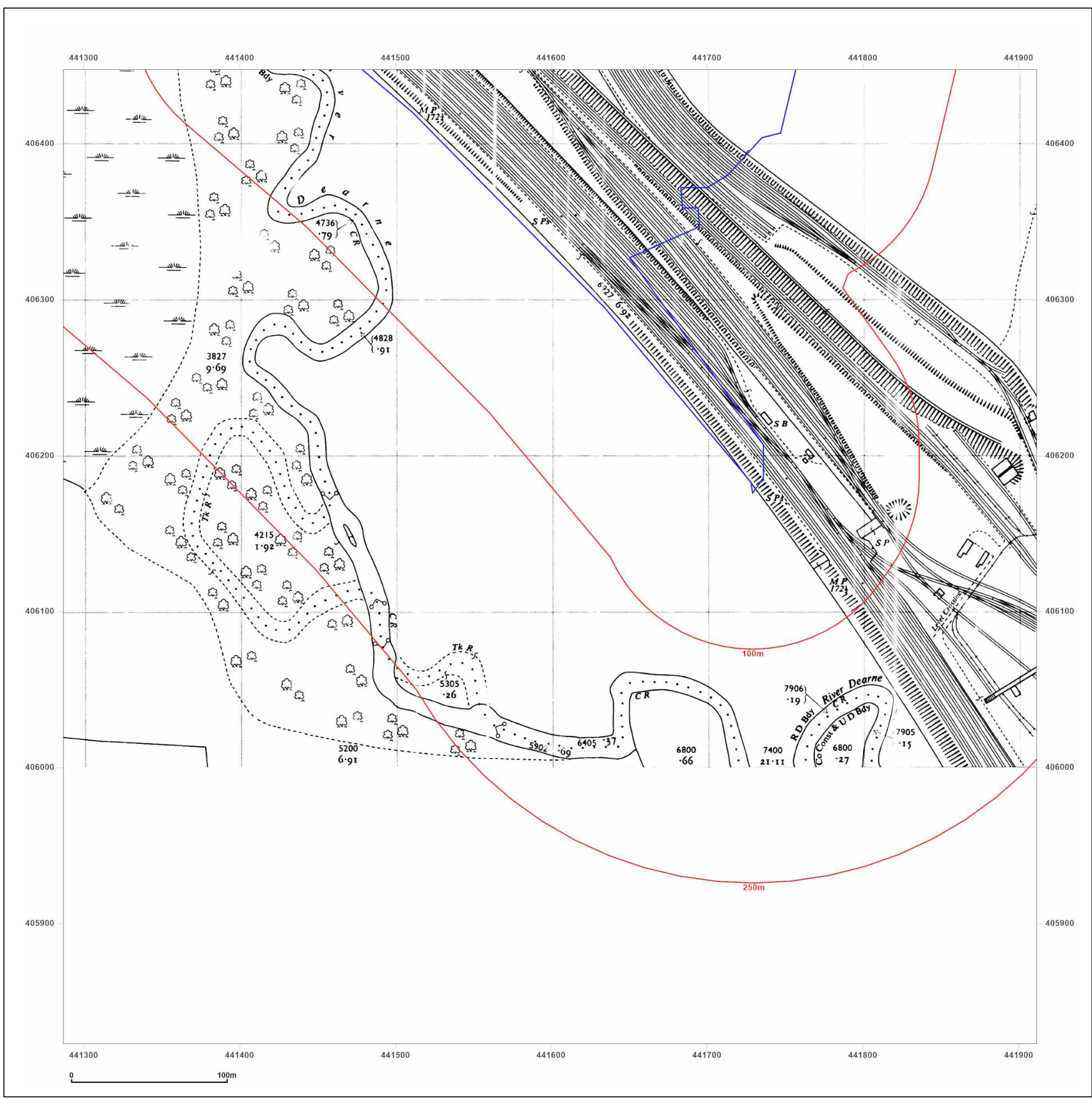


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 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_1
Grid Ref: 441599, 406135

Map Name: National Grid

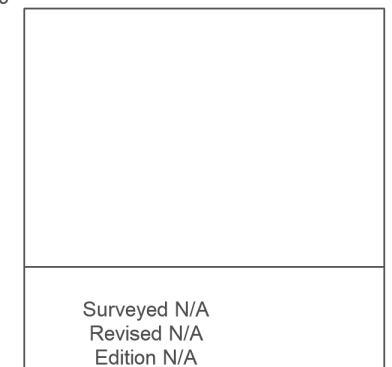
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Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1961
 Revised 1961
 Edition N/A
 Copyright 1962
 Levelled 1959



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled 1964

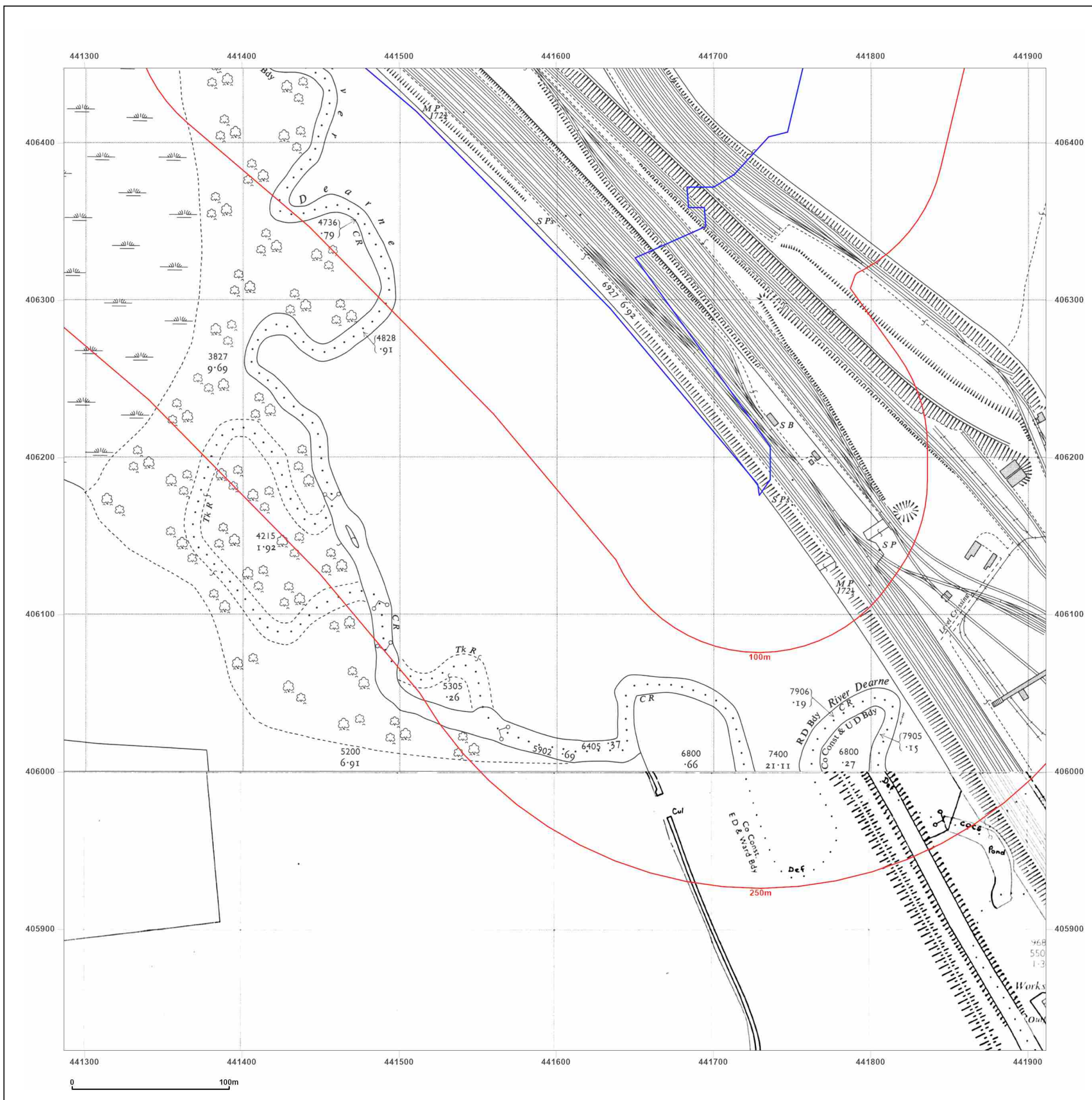


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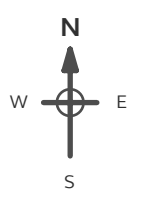
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Grid Ref: 441599, 406135

Map Name: National Grid

Map date: 1975-1979

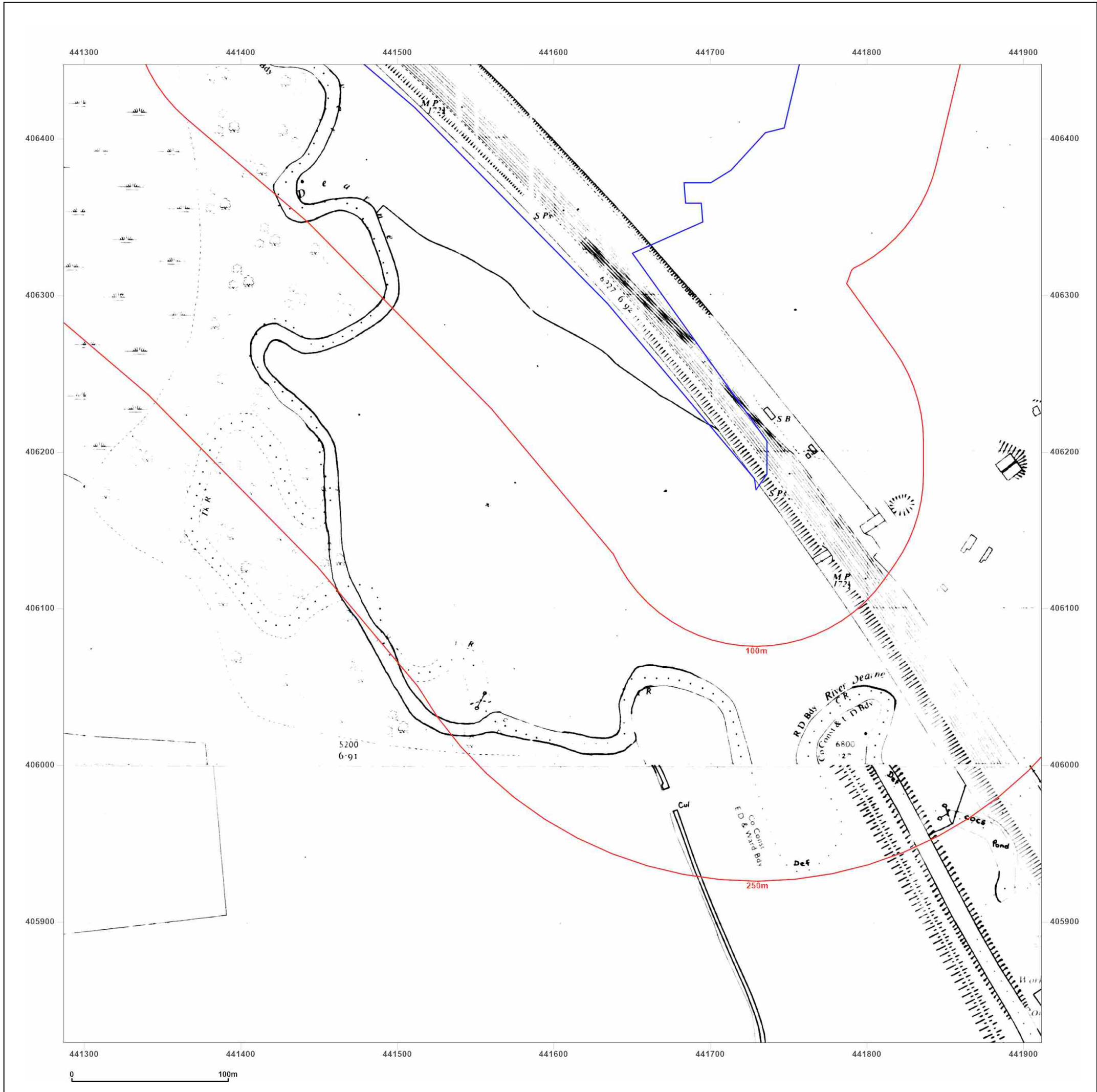
Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A





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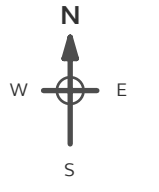
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Grid Ref: 441599, 406135

Map Name: National Grid

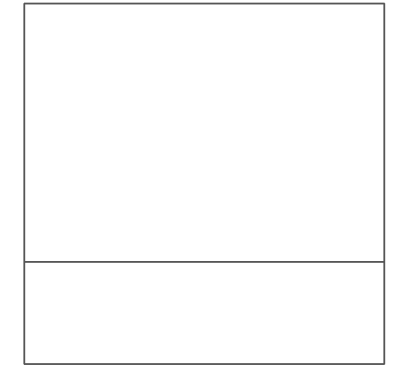
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Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1980
 Revised 1980
 Edition N/A
 Copyright 1981
 Levelled 1964

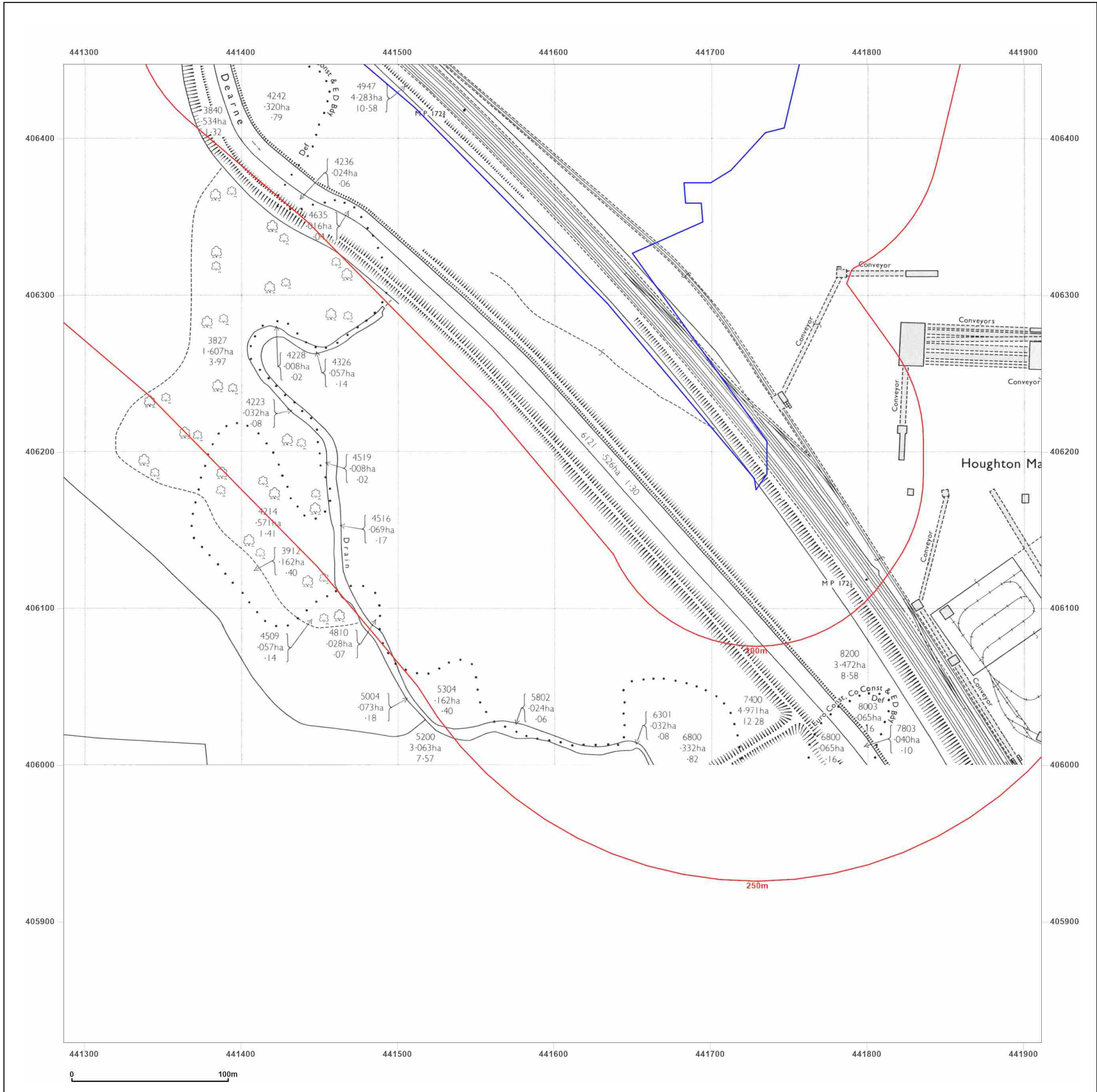


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 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_1
Grid Ref: 441599, 406135

Map Name: National Grid

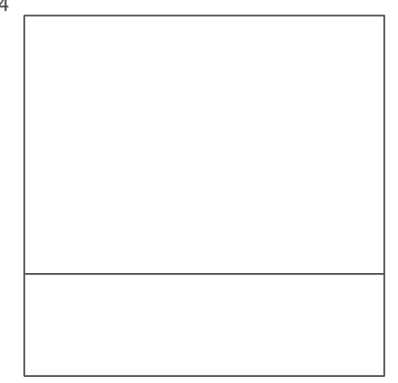
Map date: 1985

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1983
 Revised 1983
 Edition N/A
 Copyright 1985
 Levelled 1964

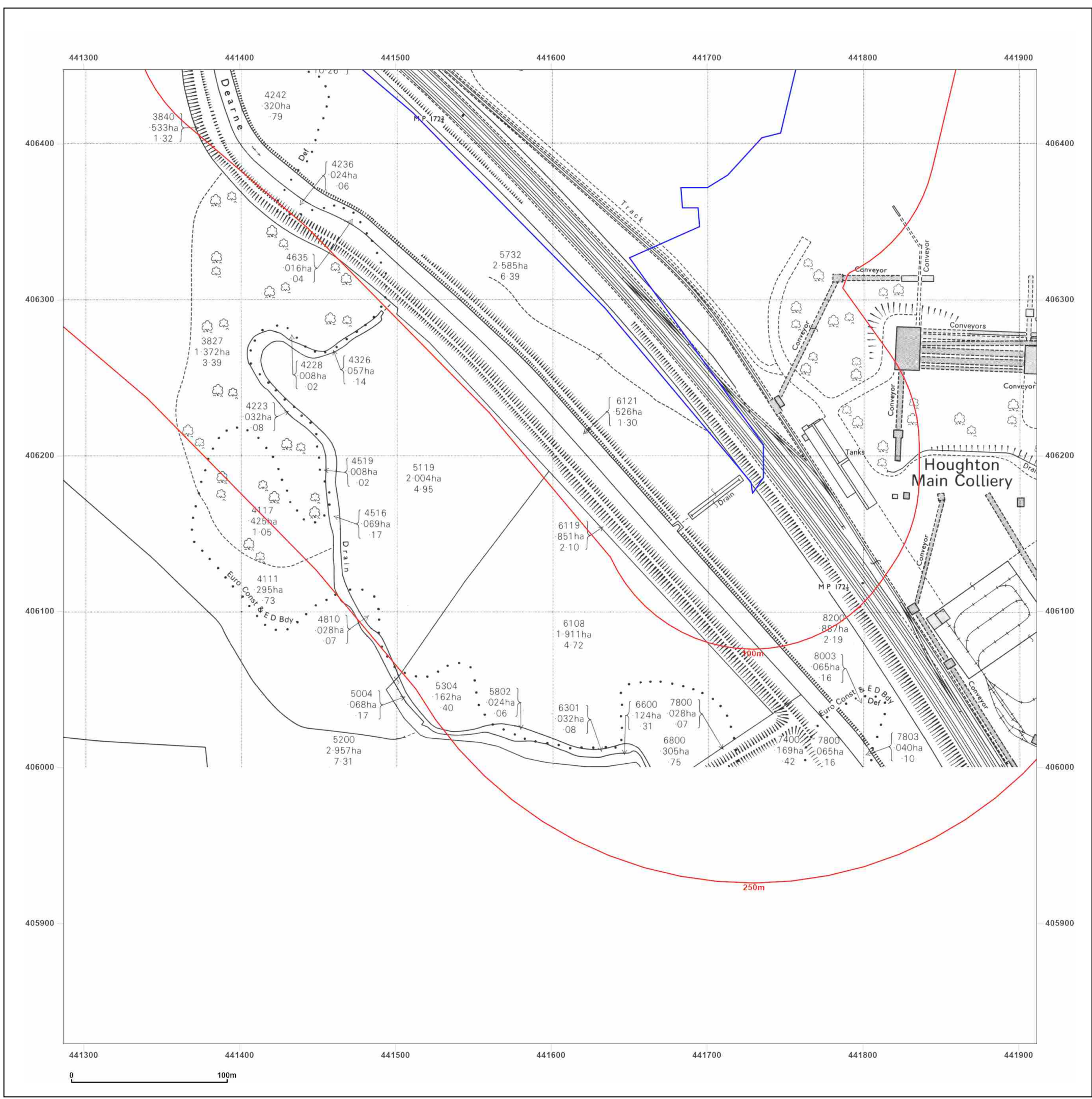


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Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_1
Grid Ref: 441599, 406135

Map Name: National Grid

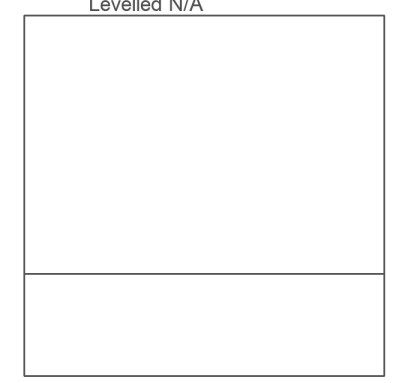
Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1993
 Levelled N/A

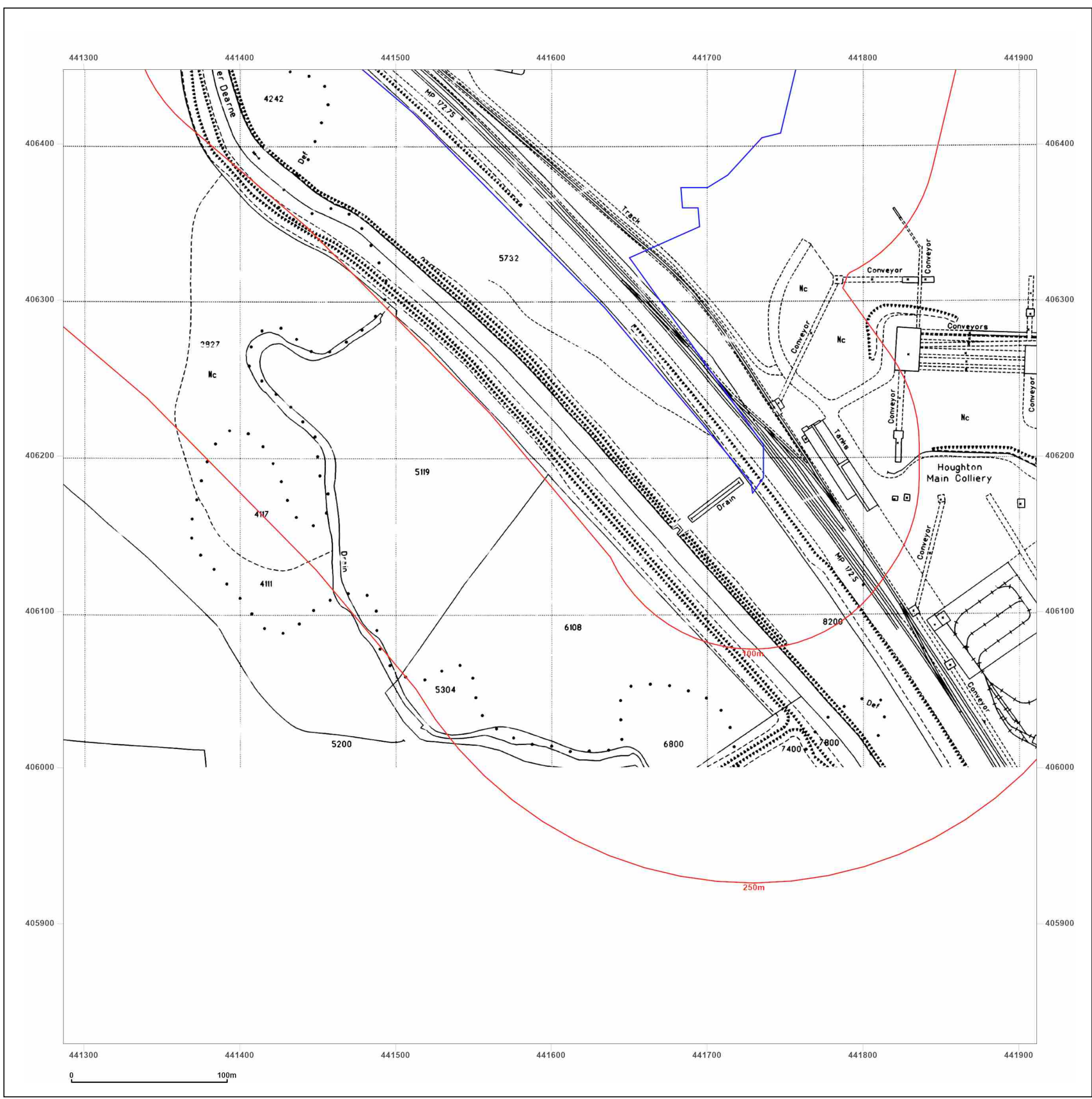


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Site Details:

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HOUGHTON, BARNSELY, S72
7GX

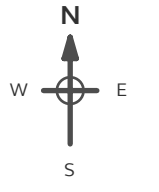
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Report Ref: GS-9391714_LS_1_2
Grid Ref: 441599, 406760

Map Name: County Series

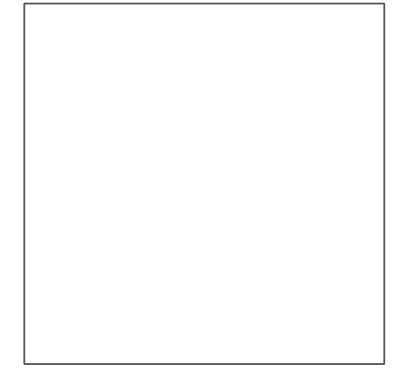
Map date: 1893

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1893
Revised N/A
Edition 1893
Copyright N/A
Levelled N/A

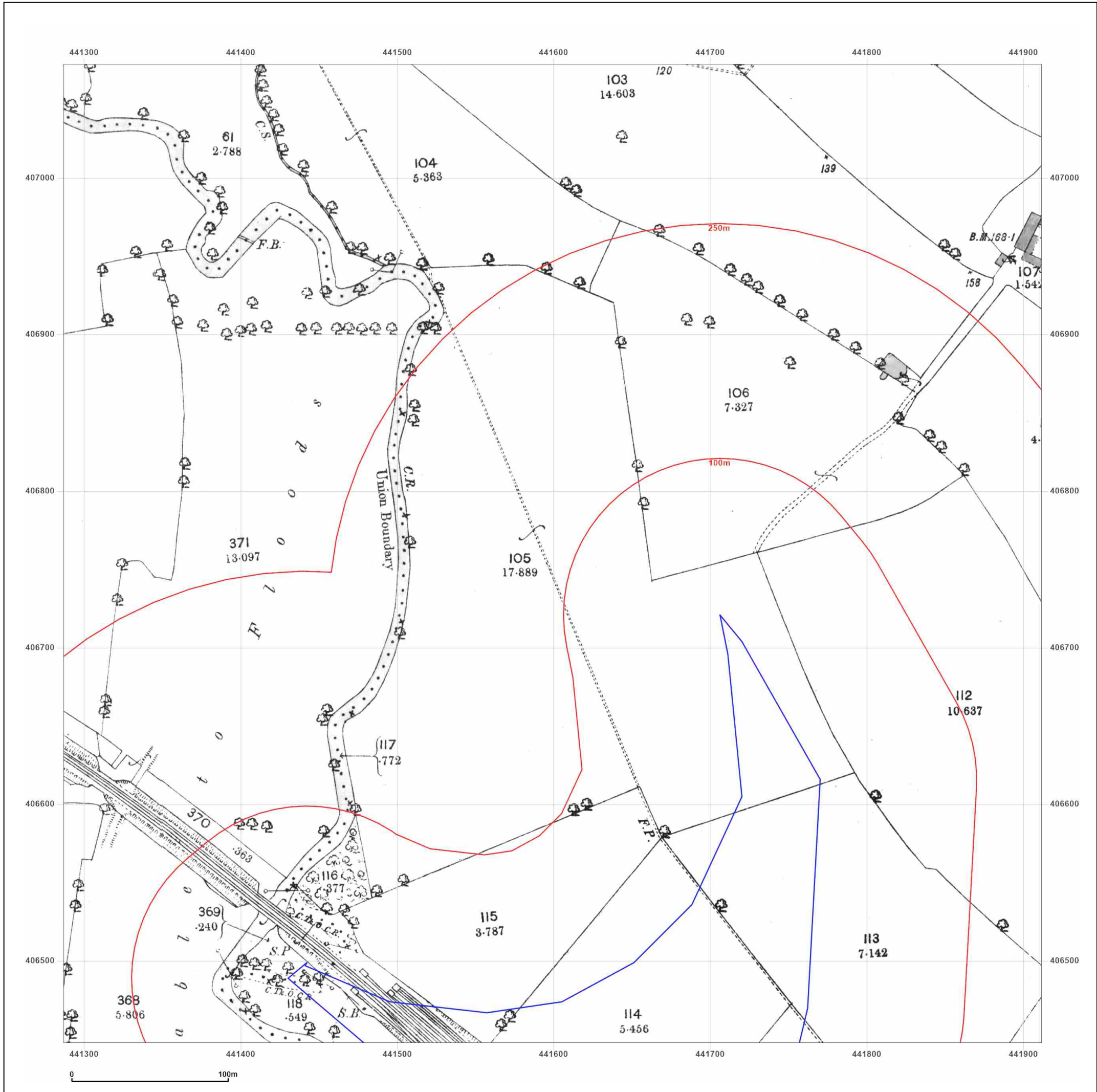


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Site Details:

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 7GX

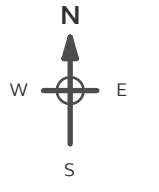
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Grid Ref: 441599, 406760

Map Name: County Series

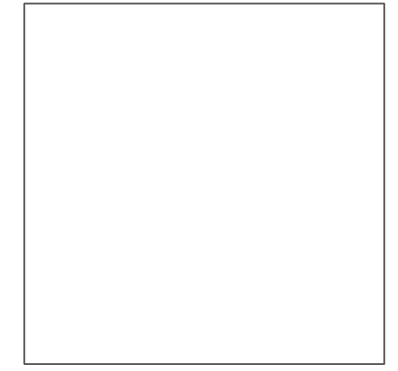
Map date: 1906

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1890
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A

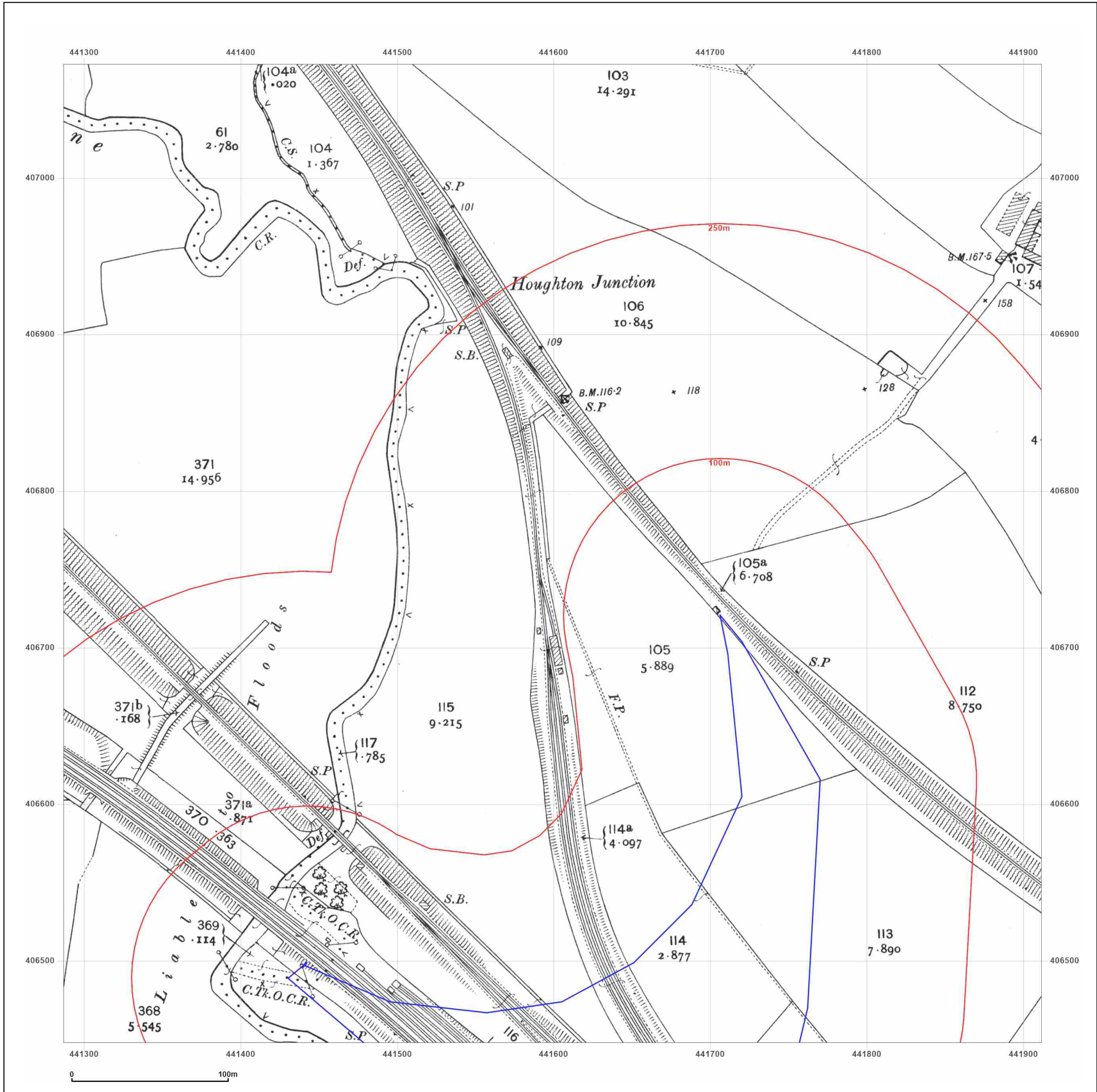


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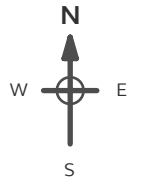
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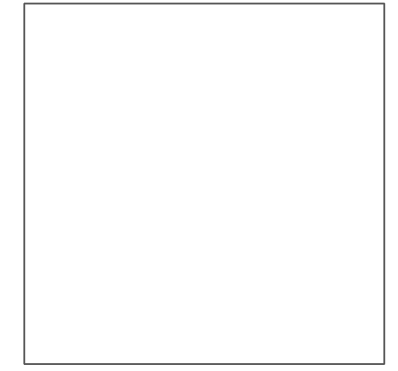
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 SPRING ROAD, LITTLE
 HOUGHTON, BARNSELY, S72
 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_2
Grid Ref: 441599, 406760

Map Name: County Series
Map date: 1931
Scale: 1:2,500
Printed at: 1:2,500



Surveyed 1890
 Revised 1930
 Edition 1931
 Copyright N/A
 Levelled 1930

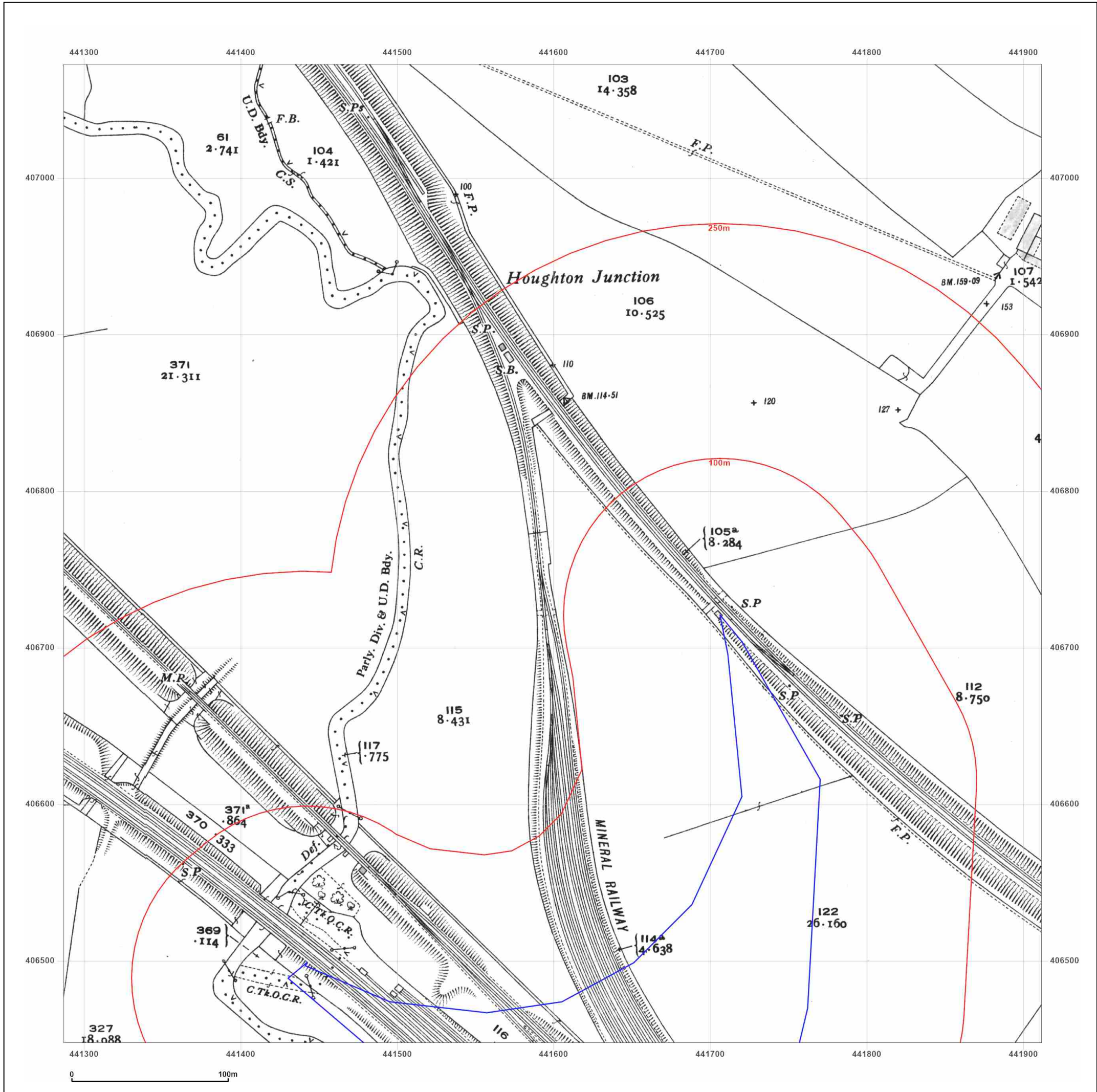


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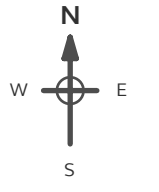
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Site Details:
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 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_2
Grid Ref: 441599, 406760

Map Name: National Grid
Map date: 1962
Scale: 1:2,500
Printed at: 1:2,500



Surveyed 1961
 Revised 1961
 Edition N/A
 Copyright 1962
 Levelled 1959

Surveyed 1961
 Revised 1961
 Edition N/A
 Copyright 1962
 Levelled 1959

Powered by

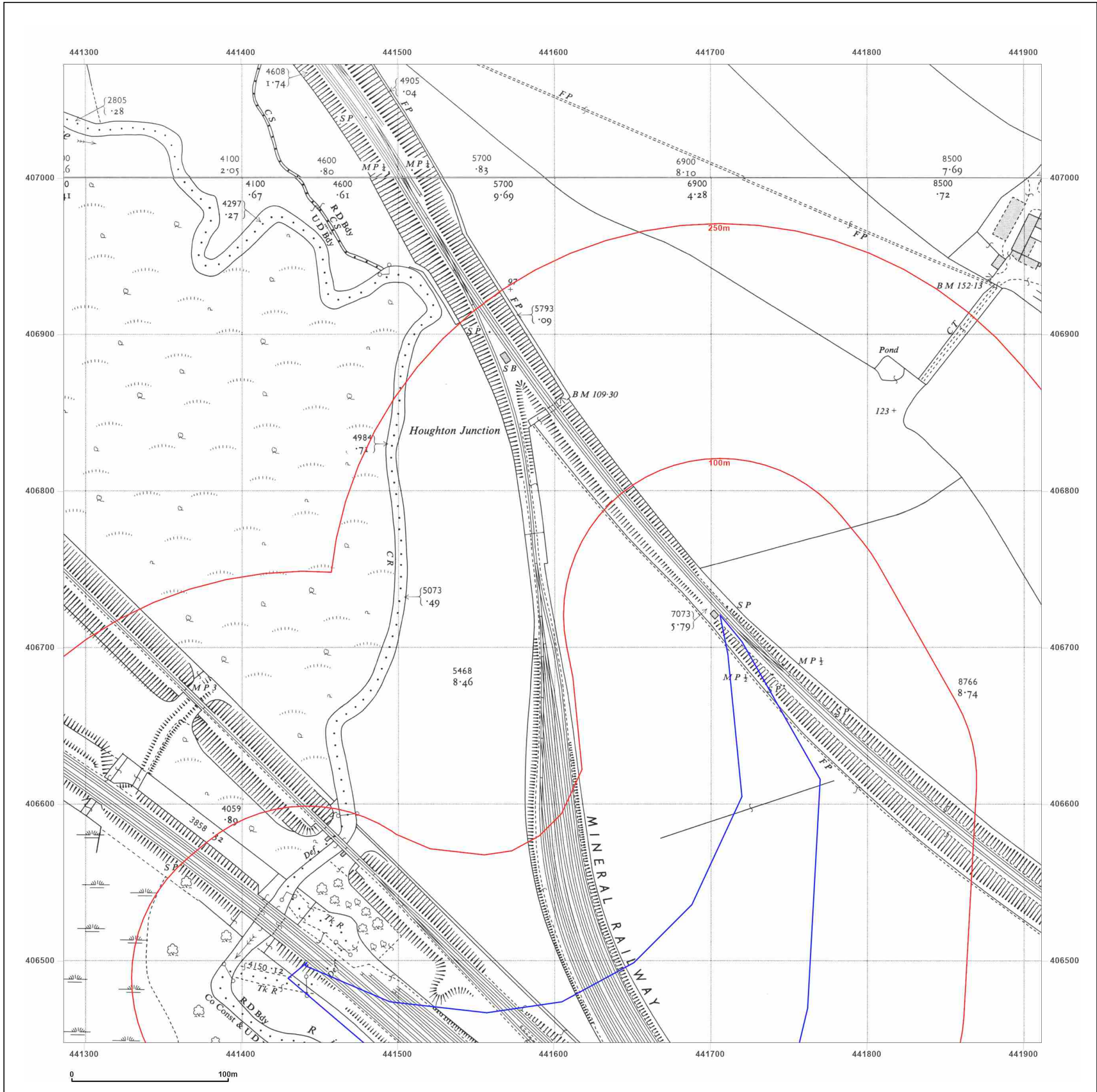


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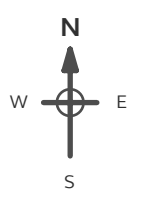
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Map Name: National Grid

Map date: 1962

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

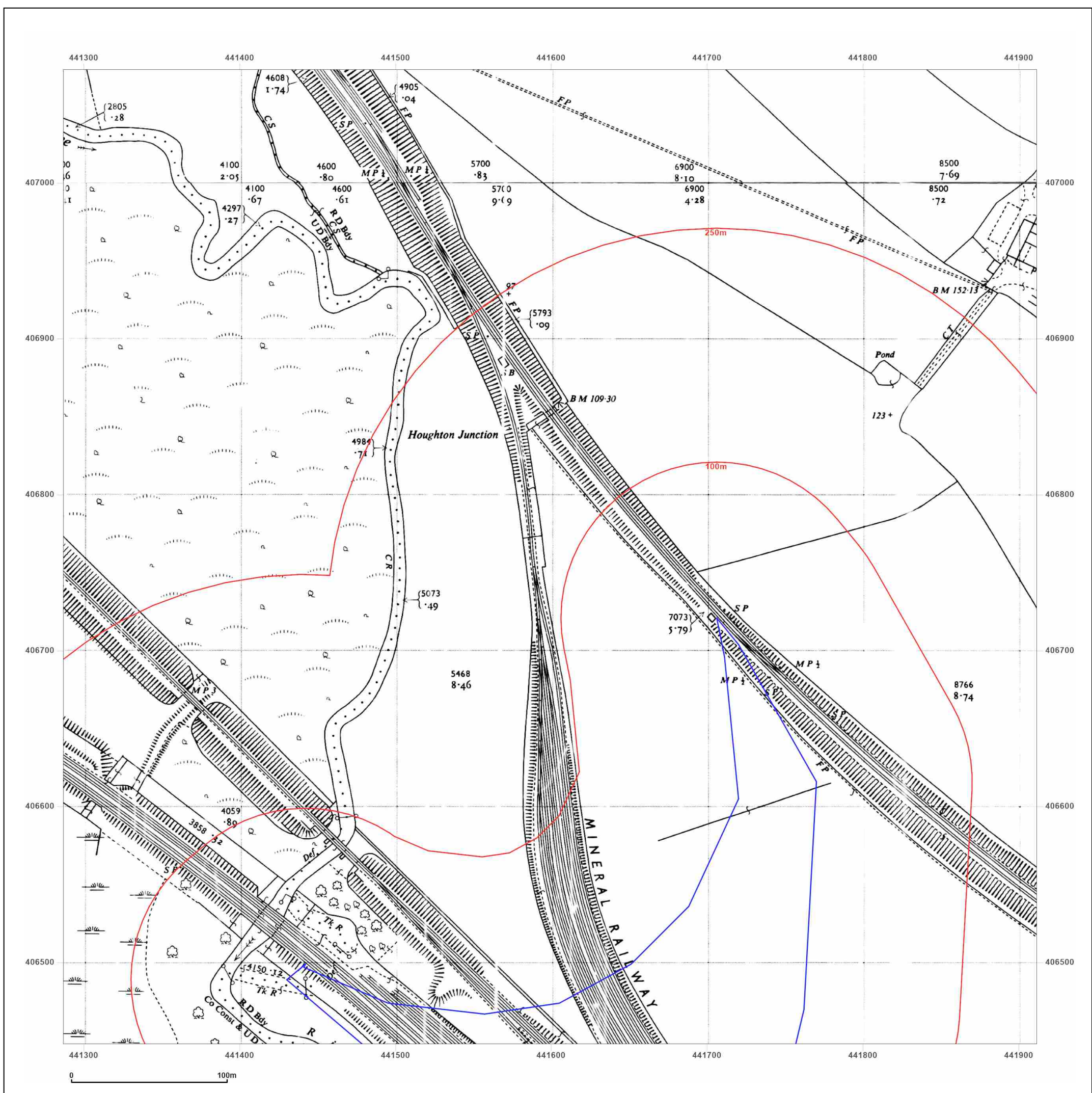


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Site Details:

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 HOUGHTON, BARNSELY, S72
 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_2
Grid Ref: 441599, 406760

Map Name: National Grid

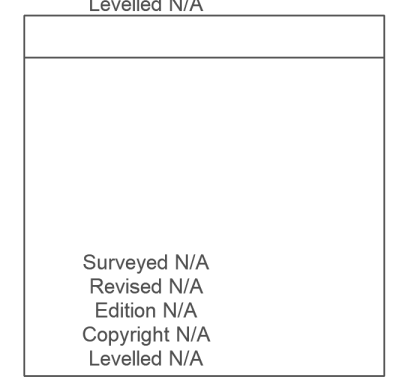
Map date: 1975-1977

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

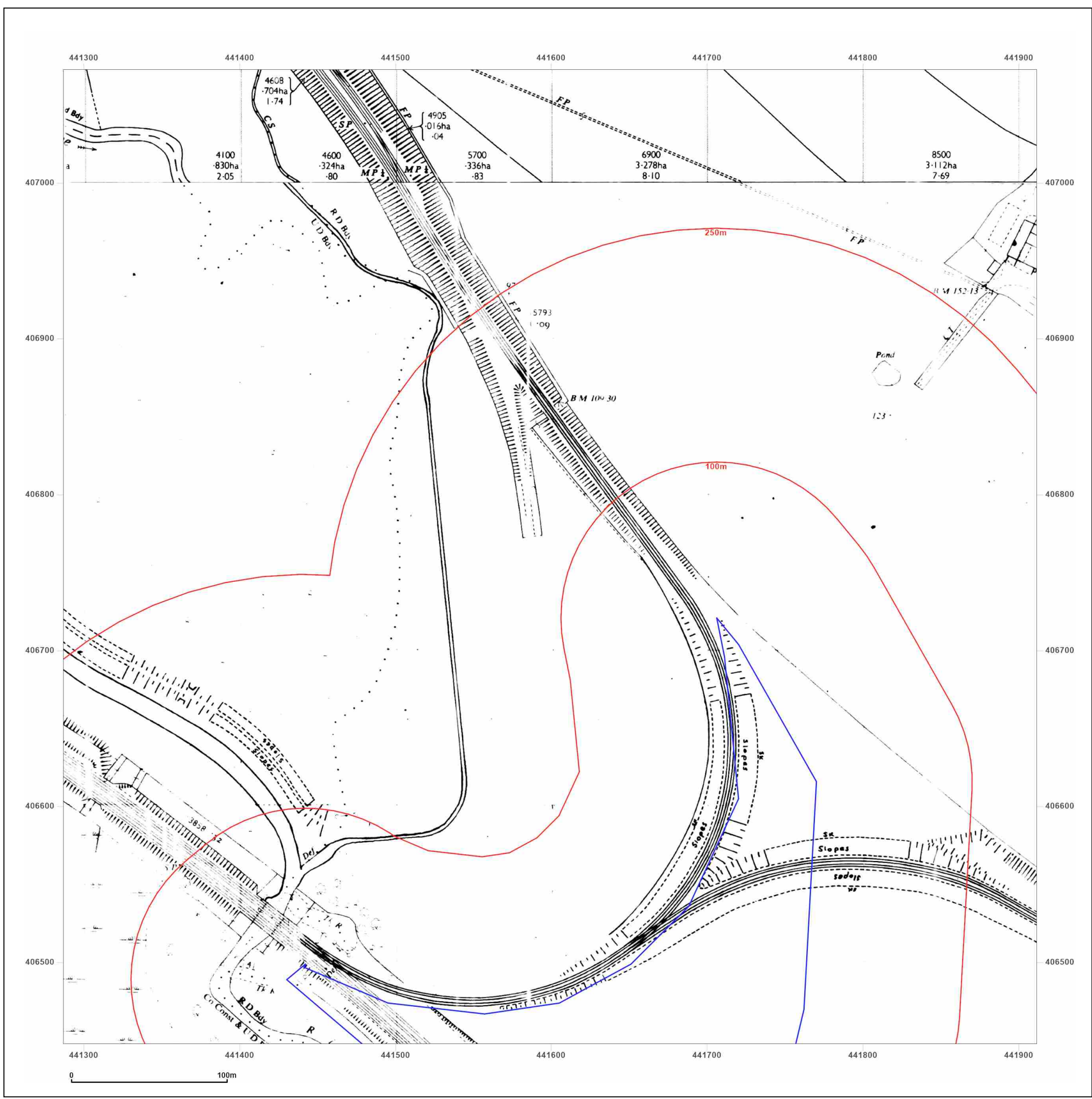


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Site Details:

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 7GX

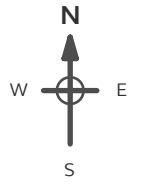
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Map Name: National Grid

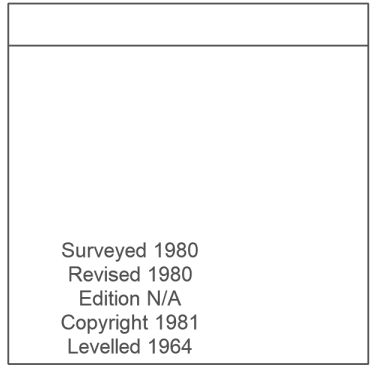
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Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1983
 Revised 1983
 Edition N/A
 Copyright 1985
 Levelled 1964



Surveyed 1980
 Revised 1980
 Edition N/A
 Copyright 1981
 Levelled 1964

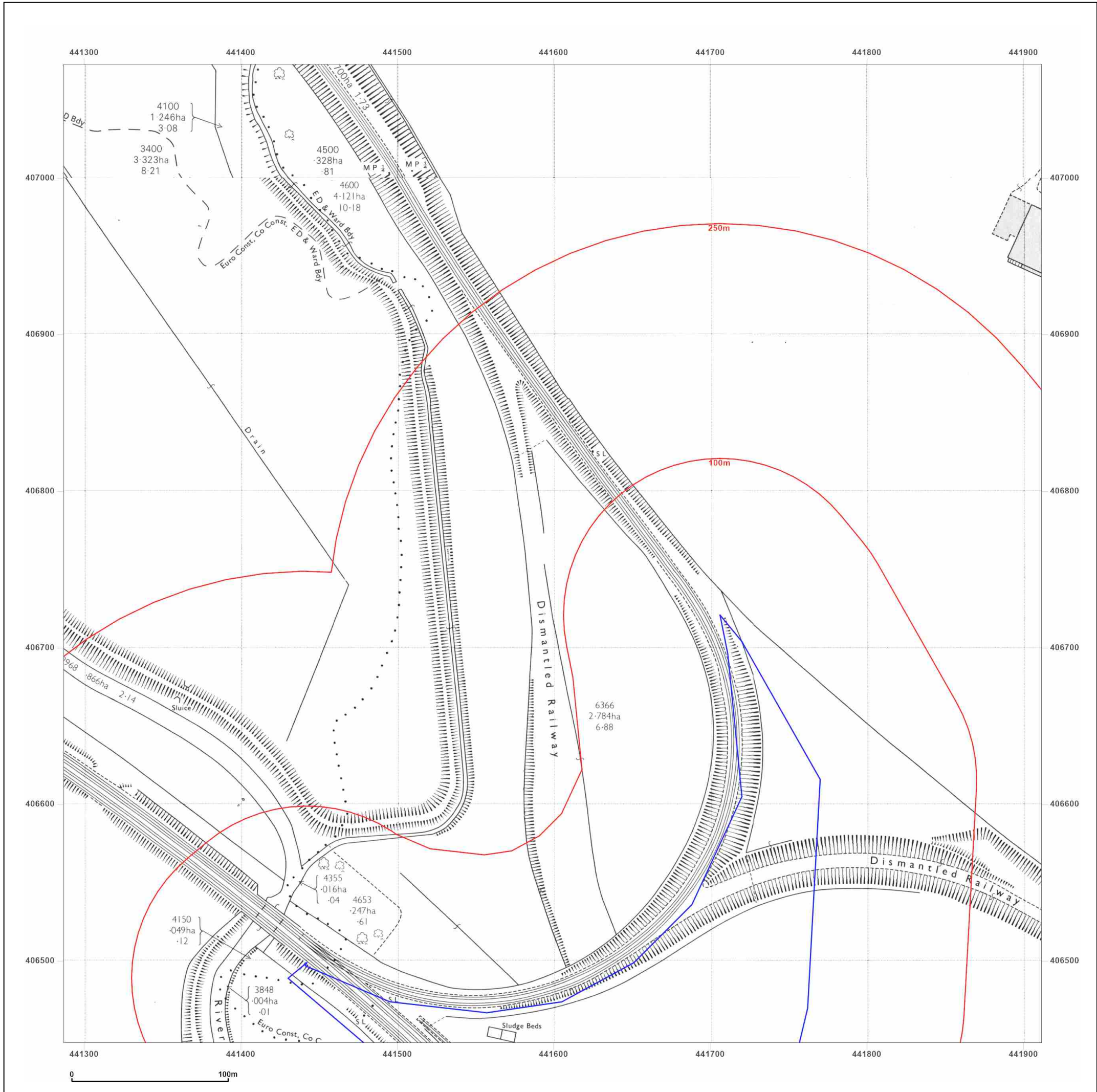


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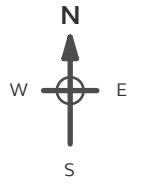
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Site Details:
 CAR PARK, ASOS, PARK
 SPRING ROAD, LITTLE
 HOUGHTON, BARNSELY, S72
 7GX

Client Ref: Grid_Powr
Report Ref: GS-9391714_LS_1_2
Grid Ref: 441599, 406760

Map Name: National Grid
Map date: 1985
Scale: 1:2,500
Printed at: 1:2,500



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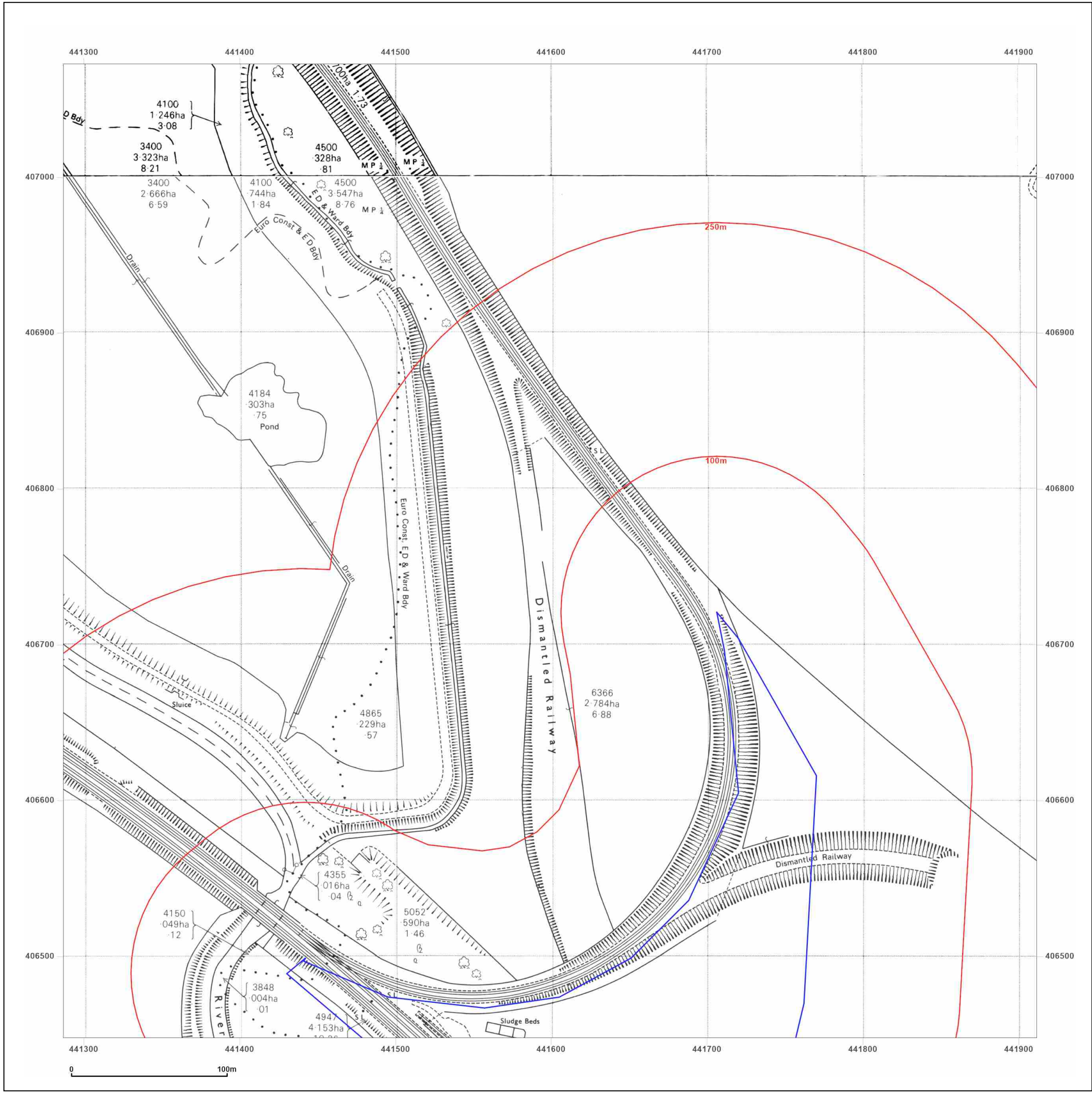


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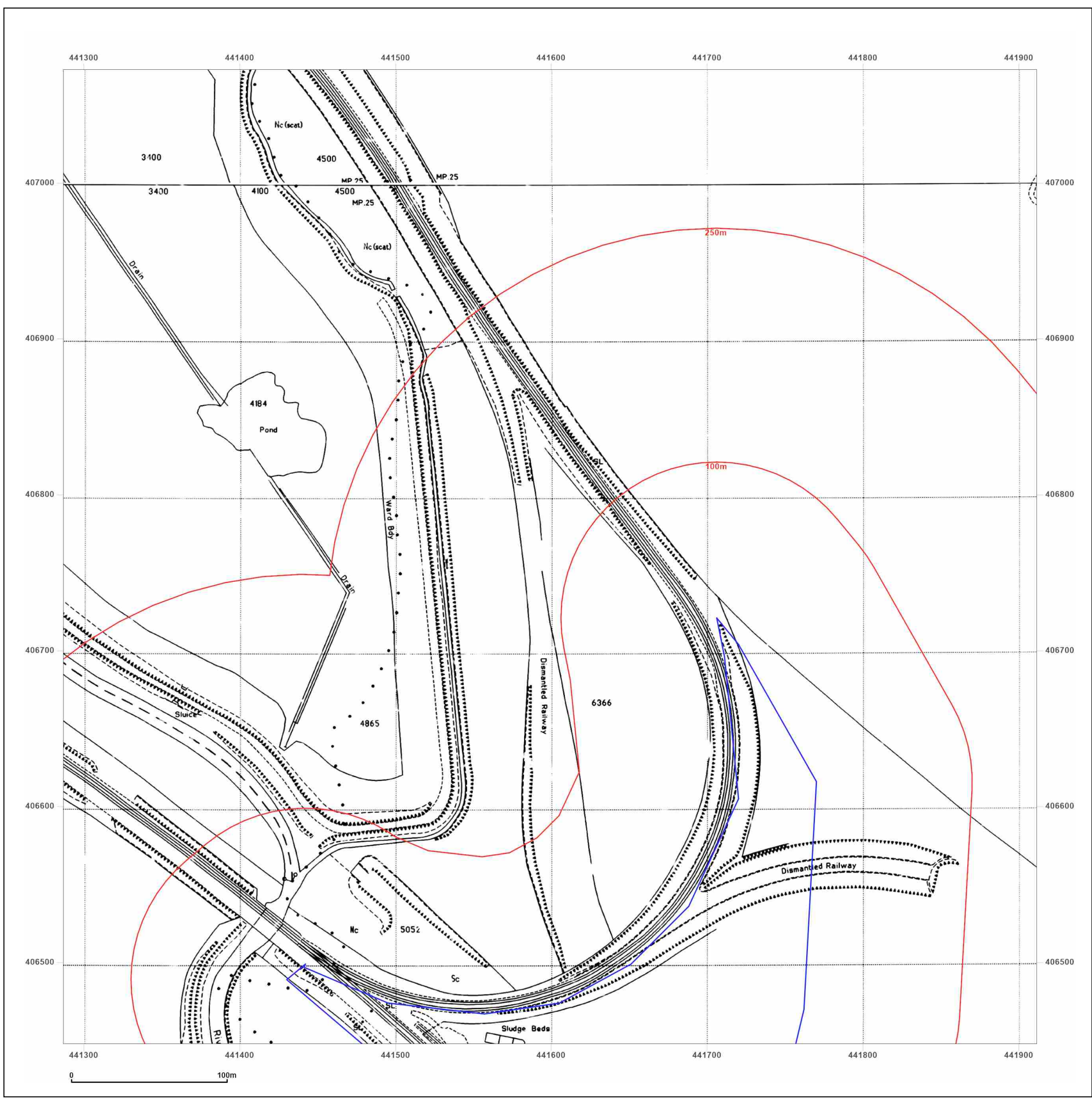


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ANNEX C: SITE PHOTOGRAPHS



Photograph 1: View of central area of site, which has been cleared of woodland



Photograph 2: View of neighbouring facility

Rev:	Date:	Desc:
0	Dec 22	Original

Client:	Grid Powr (UK) Ltd
Project:	Site Condition Report
Annex Title:	Photographs.

Job No:	SOL_22_P096_GP
Date:	December 2022



Photograph 3: Current entrance to the site



Photograph 4: View of current site condition, showing the low value woodland present on the majority of the site

Rev:	Date:	Desc:
0	Dec 22	Original

Client:	Grid Powr (UK) Ltd
Project:	Site Condition Report
Annex Title:	Photographs.

Job No:	SOL_22_P096_GP
Date:	December 2022



Photograph 5: View towards the site from the River Dearne, facing southeast



Photograph 6: View of the covered railway line, showing the sites woodland to the right side

Rev:	Date:	Desc:
0	Dec 22	Original

Client:	Grid Powr (UK) Ltd
Project:	Site Condition Report
Annex Title:	Photographs.

Job No:	SOL_22_P096_GP
Date:	December 2022



Photograph 7: Existing drain on site



Photograph 8: View of site access

Rev:	Date:	Desc:
0	Dec 22	Original

Client:	Grid Powr (UK) Ltd
Project:	Site Condition Report
Annex Title:	Photographs.

Job No:	SOL_22_P096_GP
Date:	December 2022



Photograph 9: View of neighbouring facility's access



Photograph 10: View of neighbouring facility's carpark

Rev:	Date:	Desc:
0	Dec 22	Original

Client:	Grid Power (UK) Ltd
Project:	Site Condition Report
Annex Title:	Photographs.

Job No:	SOL_22_P096_GP
Date:	December 2022



Photograph 11: Park Spring Road roundabout directly outside the site access



Photograph 12: Alternate view of site access

Rev:	Date:	Desc:
0	Dec 22	Original

Client:	Grid Power (UK) Ltd
Project:	Site Condition Report
Annex Title:	Photographs.

Job No:	SOL_22_P096_GP
Date:	December 2022

ANNEX D: CONCEPTUAL MODEL

Legend

- Alluvium (superficial deposit)
- River Dearne
- Pennine Middle Coal Measures Formation (bedrock) Mudstone, Siltstone and Sandstone dominated
- Pennine Middle Coal Measures Formation (bedrock) Sandstone dominated
- Coal seam
- Receptor
- Area of Hardstanding

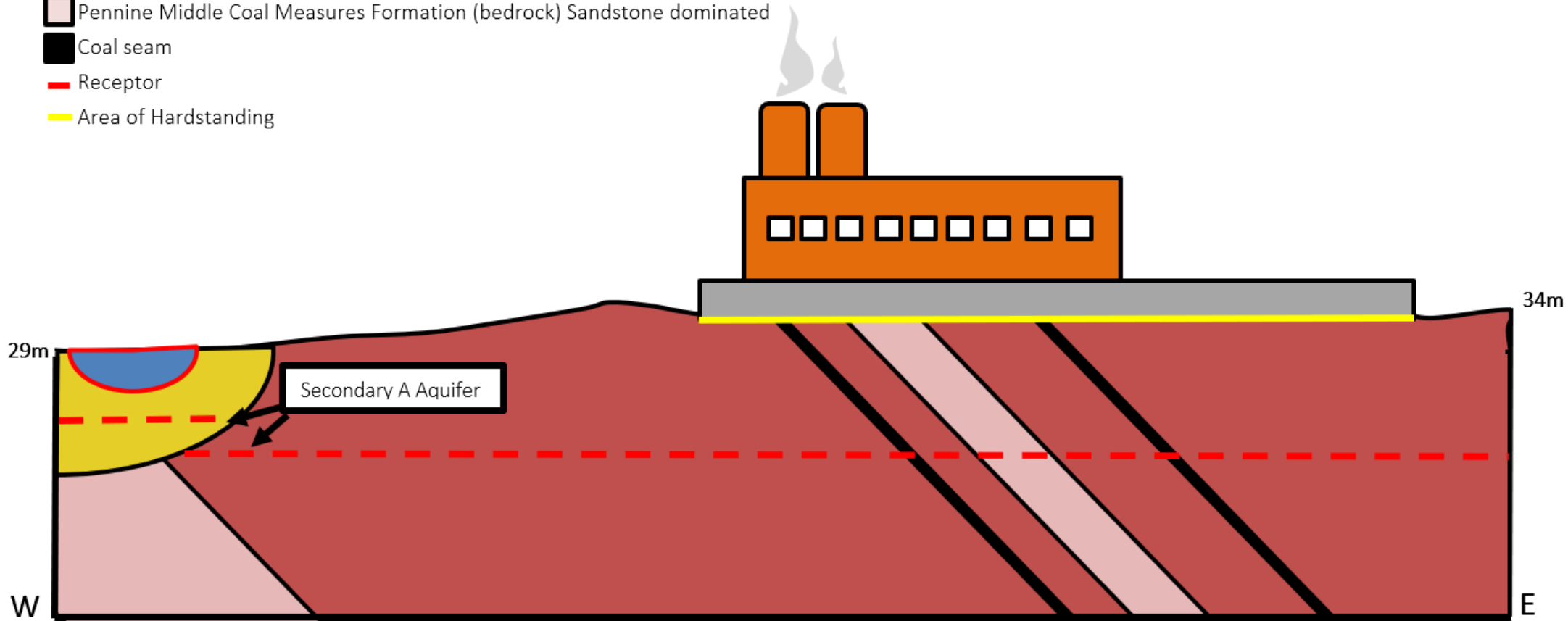


Figure D1 Conceptual Site Model

1. Do not scale off this drawing
2. All dimensions to be confirmed on site
3. This drawing is copyright of Sol Environment Ltd
4. This drawing is to be read in conjunction with relevant consultant drawings and specifications

Rev:	Date:	Desc:
0	APR 23	Original

Client:	Grid Powr Ltd
Project:	Grid Powr
Drawing Title:	CONCEPTUAL SITE MODEL

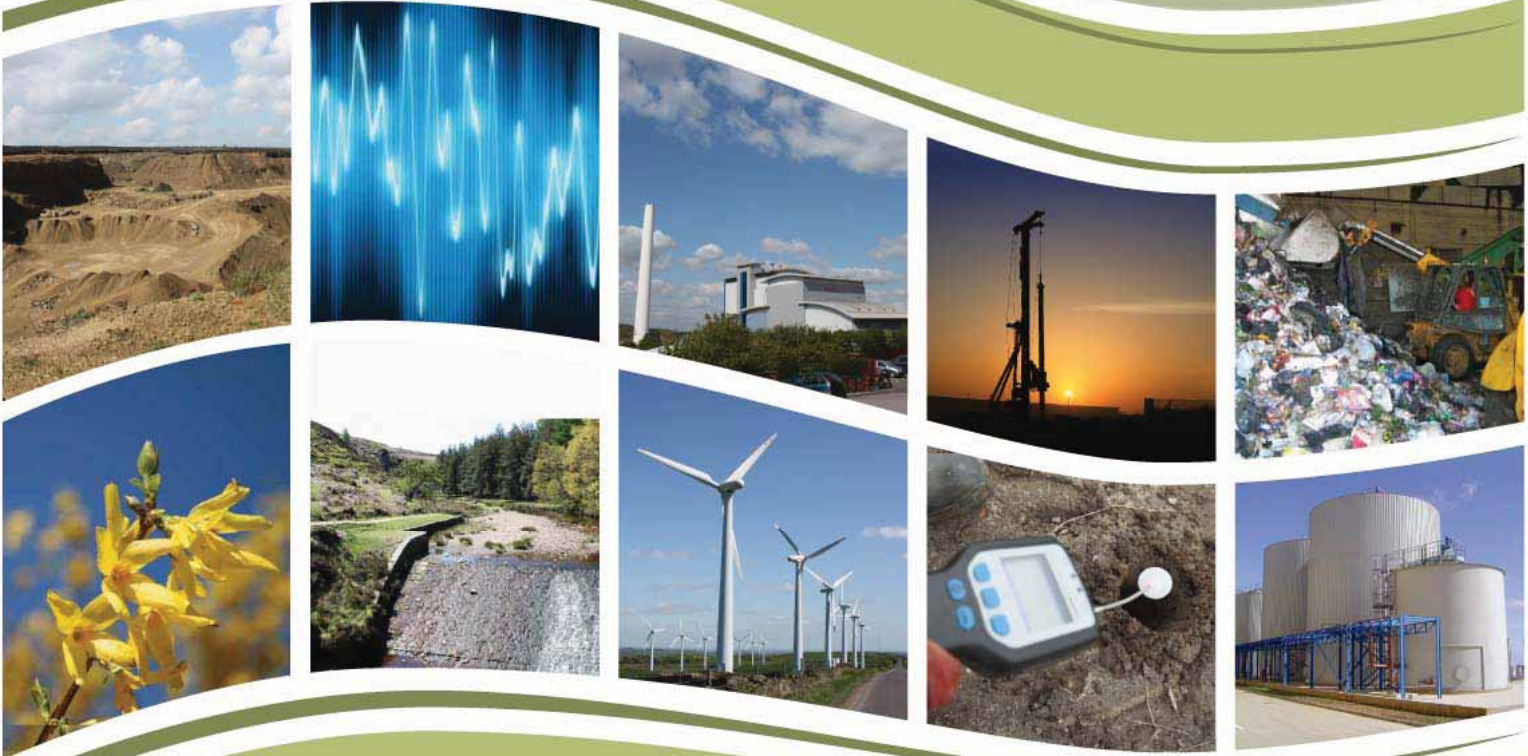
Job No:	SOL_22_P096_GP
Date:	APRIL 2023
Drawn By:	DUDLEY SAUNDERS

Drawing No:	CO01
Revision:	0
Scale:	NTS



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ANNEX E: GROUND INVESTIGATION REPORT



Contamination Assessment

Land off Houghton Main Colliery Roundabout, Park Spring Road, Barnsley,
S71 5EX

Peel Environmental Management (UK) Limited and Northern Bio Power



Contact Details:

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Contamination Assessment

Project:	Land off Houghton Main Colliery Roundabout, Park Spring Road, Barnsley, S71 5EX
For:	Peel Environmental Management (UK) Limited and Northern Bio Power
Ref:	CRM.066.004.GE.R003
Status:	Final
Date:	January 2015
Author:	Richard Hamilton Associate Director
Reviewer:	Steve Rhodes Technical Director

Disclaimer:

This report has been produced by Enzygo Limited within the terms of the contract with the client and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Enzygo Limited Registered in England No. 6525159

Registered Office Stag House The Chipping Wotton-Under-Edge Gloucestershire GL12 7AD

Executive Summary

Proposed Development

Planning Application to develop a Timber Resource Recovery Centre on land located off the Houghton Main Colliery Roundabout, Park Spring Road, Houghton Main, Barnsley.

Investigation

Site works were undertaken by Enzygo Ltd. in August and October 2014, together with a desk study and monitoring.

Ground Conditions

Ground conditions were noted to comprise Made Ground. Possible Lower Coal Measures were encountered in one trial pit. Middle Coal Measures were encountered below 28.70m bgl in borehole BH01 comprising medium strong to strong sandstone. Groundwater was encountered at 10.50mbgl and rose to 8.70m bgl in 20 minutes.

Contamination

The soil quality shows no exceedances above the reference GAC value from commercial land usage and no asbestos was detected. Leachate and groundwater analysis indicates that Fluoranthene is shown at the recommended EQS level for three samples, however given the distance of the exceedances to the nearest receptor in excess of 50m it is considered this will naturally attenuate, before affecting the surface water.

Gas

No radon risk identified. Gas monitoring identifies that Characteristic Situation 1 applies.

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1.0 INTRODUCTION

Background

- 1.1 Enzygo Limited has been commissioned by Peel Environmental (UK) Limited and Northern Bio Power to prepare a Geo-Environmental Report for a proposed timber Resource Recovery Centre including associated infrastructure on land located off Houghton Main Colliery Roundabout, Park Spring Road, Barnsley, S71 5EX.

Proposed Development

- 1.2 The existing development is shown on topographical survey drawing for the site. The existing site survey has been incorporated in to the site plan prepared by Enzygo, which is presented as Drawing CRM.066.001.D.001. A copy of the preliminary proposed site layout is included is presented in the Drawing section of this report.

Objectives

- 1.3 The objectives of the study are to:
- Review the initial desk study including the historical plans, geology, hydrogeology, site sensitivity, mining records and any local authority information available in order to complete a Desk Study;
 - Undertake a ground investigation to include the entire and surrounding site area;
 - Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors; and
 - Provide a factual and interpretative report relating to the desk study and site investigations. Provide a revised conceptual model and recommendations on any potential development issues and mitigation measures, where appropriate.

Risk Classification

- 1.4 Enzygo has utilised the available information, together with our experience to assess the likely risks to development from land quality issues. Definitions of the risk terms used are provided on the following table.

Risk	Description
Negligible	No contamination risk has been identified which is likely to affect development.
Low	No significant contaminated land risks have been encountered affecting development and a low risk that remediation will be required.
Low-Moderate	There are unlikely to be significant contaminated land issue associated with the site which will adversely affect its re-development. However, minor or localised contamination may be present requiring remediation. Remediation should be possible under a discovery strategy and with a call out service.
Moderate	Some potential contaminated land risks have been encountered or identified which may affect re- development. The risks identified are unlikely to affect the entire site or preclude development. Remediation is considered feasible as part of the development process and no further investigation is considered necessary.
Moderate-High	Some potentially significant contaminated land risks have been identified at the property that requires remediation. It is recommended that a separate remedial methodology is prepared supported by a site specific risk assessment
High	Significant potential contaminated land risks have been identified and remediation is required supported by further intrusive ground investigation, risk assessment and remedial design.

1.5 Where adverse risks from ground instability are identified these are discussed within the report.

2.0 SITE SETTING

Site Description

Item	Description
Site Address	Land off Houghton Main Colliery Roundabout, Park Spring Road, Barnsley, S71 5EX.
National Grid Reference	441799,406582.
Site Area	Approximately 2.915ha

Current Site Description

- 2.1 The following site description has been compiled from the site inspection of the proposed site area undertaken by Enzygo staff, together with current maps and aerial photographs.
- 2.2 The site is currently comprises overgrown derelict land with shrub bushes and rough grassland.
- 2.3 A former railway embankment is shown on the north west boundary of the site.
- 2.4 There are no public restrictions on the site and there are numerous dog walking paths traversing the site.
- 2.5 Park Spring Road marks the eastern boundary of the site. There are no buildings currently on site.
- 2.6 The site is accessed from the Houghton Main Colliery Roundabout to the south east of the site.
- 2.7 There didn't appear to be any drains onsite.
- 2.8 The River Dearne is shown 10m to the south of the site.
- 2.9 During the time of the investigation a bund was shown to the south of the site and off the main access road to the south.
- 2.10 A further site entrance was also located off Park Spring Road to the east of the site.
- 2.11 Large parts of the site were not accessible due to considerable shrubs and tree growth. The majority of the trees are Silver Birch with the main concentrations of trees on the north western and south eastern boundaries.

Surrounding Area

2.12 The surrounding land uses surrounding the site are summarised as follows:

Direction	Land Use
South	Open space, River Dearne and flood plain. SE corner commercial building (sub-station).
East	Park Spring Road (A6195), car parking associated with the commercial unit/warehouse, Large docking warehouse/commercial unit.
West	Old railway embankment open scrub land.
North	Park Spring Road (A6195) and open fields.

2.13 No significant contamination risk to the site is noted.

3.0 SITE HISTORY

3.1 A review of historical Ordnance Survey maps and information pertinent to the site of the annex and within a 250m radius is summarised below:

Potentially Contaminative Historical Land Use		
Map Edition	Site	Surrounding Area
1890	Mineral railway within SW corner of the site. Remainder of the site comprises open fields. This railway line is shown on an embankment	Open fields surround the site, River Dearne 4m NW. Park Field House 250m NE. Houghton Main colliery 300m SE. Mineral Railway crossed the River Dearne 4m NW.
1906	A second railway line (Midland Railway) is present to the north east of the existing line with a set of siding in-between. A further line (Mineral Railway) is shown dissecting the site into two halves from the north to the south east. A third line (Dearne Valley Railway) is shown crossing the far northern corner of the site. All the additional lines are shown on embankments. A foot path is shown crossing the centre of the site.	Houghton Main Colliery has enlarged and now includes a Sewerage works 300m SE. Houghton Junction is shown 250m NW.
1931-1955	Foot path no longer shown.	Houghton Main Colliery has enlarged to the W and N and includes numerous spoil heaps and an aerial cable.
1961-1967	Foot path shown on the S boundary of the northern railway (northern section of the site).	Houghton Main colliery shown as Mine. Spoil heaps shown 100m W.
1980	The additional tracks to the NE of the original line and the line dissecting the site are not shown. The central railway is shown as a dismantled railway. An additional line is shown on the NW boundary of the site which connects the line to the SW with the line to N. A further branch line is shown off the NW line which dissects the site and loops back onto the previous line to the N. A sludge pit is shown within the W of the site.	Mine renamed Houghton Main Colliery and totally reconfigured with a number of new scattered buildings in the area of the former spoil heaps including the main winching buildings and three conveyors. One of which is located 50m SE. Dearne railway shown as dismantled. The river Dearne has been realigned and now in on an embankment to the S and W of the site.
1983-1993	The branch line to the N is shown as dismantled.	Houghton Main Colliery has enlarged NE with a new conveyor linked the colliery with a new spoil heaps to the NE. Two tanks are also shown associated with the main building.
2002	The Railway to the S is not shown. The site is shown as open space with the exception of one previous railway embankment along the NW boundary of the site.	Houghton Main Colliery has been demolished and is shown as Disused Works with no buildings. The Spoil heaps to the NE still remains. A road and roundabout are shown on the eastern boundary of the site.
2012	The railway to the S and N are not shown and the perimeter railway along the northern western boundary is shown as dismantled.	A large commercial building is shown in the area of the former Houghton Main Colliery site 50m to 300m E of the site. A smaller commercial building is shown 10m SE of the site and to the S of the roundabout. The roundabout is referenced Houghton Main colliery Roundabout.

3.2 There is a low risk associated with the previous railway lines and sidings across the site.

- 3.3 Evidence supplied by the Coal Authority and the South Yorkshire Mining Advisory Service indicates that the site was used as an open cast coal pit from 1997 to 2000. There are no available historical plans for this time period. The open cast works was backfilled with compacted earthworks materials. There is a low to moderate risk associated with the backfill materials.
- 3.4 No other significant risks are identified

4.0 ENVIRONMENTAL SETTING

Ground Conditions

- 4.1 The British Geological Survey (BGS) indicates that the hotel extension is underlain by the following geological sequence:

Geological Unit	Type	Description	Aquifer Classification
Drift.	Alluvium.	Clay and Silt.	Secondary (A).
Solid.	Middle Coal Measures.	Mudstone, Siltstone Sandstone and Coal.	Secondary (A).

- 4.2 Made Ground has been recorded on the site. This is associated with the backfill of the open cast coal pit. The permeability of the Made Ground is shown as very high to very low reflecting the mixed nature of the materials.
- 4.3 There are no records of landslips within 500m of the site.
- 4.4 Records of background soil chemistry do not show any elevated concentrations.

Groundwater

- 4.5 The recorded permeability of the drift geology is very low to low reflecting the cohesive nature of these materials. The recorded permeability of the solid geology depends on the classification as a sandstone, siltstone or mudstone and varies accordingly from low to high and has fracture flow type. The permeability of the materials underneath the site is dominated by the Made Ground.
- 4.6 The GroundSure Report shows that the site is not located within a Source Protection Zone.
- 4.7 There are no groundwater abstraction licenses within 1000m of the site.

Mining

- 4.8 The site has been subject to an opencast colliery site. Further details are given in the Mining desk study.

Natural Cavities

- 4.9 No natural cavities are identified within 1000m of the site.

Ground workings

- 4.10 There are a number of historical groundworkings identified within 250m of the site. The closest is associated with the open cast works with further ground workings being associated with the colliery.

Hydrology

- 4.11 There are no water courses on the site. The nearest main river is called the River Dearne and is shown 10m north west at a bridge crossing bordering the western and southern boundary. The river quality of this river has been recorded on the former railway bridge to the north west of the site with a general chemical quality grade D (Poor) and a general biological quality grade D (Poor) both of which were recorded in 2009.
- 4.12 The site is located within a flood zone 2. This is assessed within the Flood Risk Assessment Report prepared by Enzygo Ltd.

Radon Risk Potential

- 4.13 The Groundsure Report indicates that no precautions are necessary to protect against Radon.

Natural Hazards Finding

- 4.14 BGS information presented within the Groundsure Geosight report identifies the following ground conditions:

Hazard	Risk Designation (Groundsure)
Coal Mining	Risk identified and assessed in the coal mining desk study and associated with the open cast works and deep coal.
Collapsible Ground	Negligible to Very low.
Compressible Ground	Negligible to very Low.
Ground Dissolution	Null.
Landslide	Very Low to Low.
Running Sand	Negligible to Low.
Swelling / Shrinking Clay	Negligible to low.

- 4.15 There are no further geotechnical ground risks which have not been described in the Coal Mining Section of the previous desk study.

Sensitive Land Uses

- 4.16 The site comprises derelict land and is considered to be of low sensitivity.
- 4.17 English Heritage has not identified any listed buildings or scheduled ancient monuments on the site.

Environmental Sensitivity

- 4.18 Overall the site is currently considered to be of Low/Moderate sensitivity due to the following:
- The underlying stratum is classified as an Secondary A Aquifer which can provide base-flow to water courses and there is a water course close to the site;
 - Secondary aquifers can provide local water sources but there are no groundwater abstractions within 1000m or of the site;
 - The site is not within a source protection zone;
 - No ecological designations on the site.
- 4.19 The likely proposed end use of the site is employment and so the future sensitivity will be low for end users.

Industrial Land Uses.

- 4.20 Potentially contaminative industrial uses identified within 250m of the site are limited to electrical substation which is not to pose a significant risk to the site
- 4.21 There are no petrol filling stations within 500m of the site.
- 4.22 There are no high pressure pipelines within 500m of the site.
- 4.23 No new risks are identified from the register of industrial land uses.

5.0 CONSULTATIONS

Regulatory Database

- 5.1 No significant risks are identified from the commercially available environmental database.

Landfill Sites and Waste Treatment Sites

- 5.2 No significant risks are identified from waste activities.

6.0 PRELIMINARY CONCEPTUAL MODEL

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Asbestos, metals and hydrocarbons.	Potential Made Ground on site from infill of colliery open cast pit.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Normal construction PPE will address risk under CDM.
			Site users.	Low/Moderate.	Unknown fill within the backfilled pit (apart from compacted earthwork materials). Low sensitive end use.
Metals.	Potential Made Ground and waste from former railways.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Normal construction PPE will address risk under CDM.
			Site users.	Low.	The majority of the Railway ballast materials will have been removed as part of the opencast works. Low sensitive end use.
Hydrocarbon and metals.	Migration from off-site sources.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
Ground Gas.	Historic Landfills.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
	Made Ground.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No confined access likely.
			Site users.	Negligible.	Unlikely to be significant highly putrescible matter.
	Mine Gas	Inhalation & Explosive.	Construction Workers.	Negligible/Low	No confined access likely and groundwater has stabilised therefore minimising risk of gas migration into compacted backfill materials. Given distance of recorded mine shafts 300m SE negligible risk
			Site users.	Negligible/Low	No confined access likely and groundwater has stabilised therefore minimising risk of gas migration into compacted backfill materials. Given distance of recorded mine shafts 300m SE. negligible risk
Groundwater					
Assessed within the Hydrogeological Desk Study Report.					
Surface Water					
Assessed within the Hydrogeological Desk Study Report.					
Environmental Receptors					
On site contaminants	Ingestion dermal and inhalation.		Ecology.	Dismissed.	No sensitive ecology designation.
	Direct.		Archaeology.	Dismissed.	None present.
	Direct.		Geology.	Dismissed.	None present.
	Phytotoxic.		Woodland.	Dismissed.	None present.
	Phytotoxic.		Crops.	Dismissed.	None present.
	Ingestion dermal and inhalation.		Livestock.	Dismissed.	None present.
Building Services					
On site contaminants	Direct.		Historic Buildings.	Dismissed.	No receptors
	Direct.		Proposed Buildings.	Dismissed.	No source identified.
	Permeate into pipework.		Water Pipes.	Dismissed.	No source identified.

- 6.1 There is a low to moderate risk associated with potential contaminants from the backfill materials.
- 6.2 There is a negligible to low risk of gas migration from the mine shafts 300m from the site, given that the groundwater has stabilised and the backfill materials have been compacted.

7.0 SITE INVESTIGATION

General

- 7.1 A ground investigation and monitoring was undertaken by Enzygo during September 2014 based on the findings of the desk study and taking account of the entire site. The works undertaken are show on Drawing CRM.066.001.D.001 and summarised in the table below:

Rational	Exploratory Holes	Notes
Groundwater and gas	WS1 to WS5, BH01	Installations.
Entire Site coverage	TP01 to TP20 and WS1 to WS5 and HP01 to HP02	Hand pits done in the position of two trial pits as machine could not get to locations.

- 7.2 The density of granular soils and shear strength of the cohesive soils was measured using a Standard Penetration Tests (SPT). Results are included on the logs presented in Appendix B.
- 7.3 Representative soil samples were collected for chemical testing. Soil samples destined for chemical analysis were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that was cleaned at each sampling location.
- 7.4 Generally samples were collected from Made Ground, which may contain potential inclusions of contaminating materials and also materials displaying evidence of potential contamination.
- 7.5 In the absence of any evidence of contamination samples were collected near surface as this material is more likely to be contaminated by surface spillages and also will potentially be in contact with future residents.

Laboratory Testing

- 7.6 Samples for chemical analysis were sent to the Environmental Laboratories Ltd who are NAMAS and MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, banded Total Petroleum Hydrocarbon (TPH) and asbestos screen.
- 7.7 Given that no groundwater was encountered leachate analysis was taken from soils samples and was carried out by Environmental Laboratories Ltd who are NAMAS and MCERTS accredited.

8.0 GROUND AND GROUNDWATER CONDITIONS

Summary of Ground and Groundwater Conditions

8.1 The investigations undertaken by Enzygo Ltd identified the following strata:

Strata	Summary Description	Thickness (m)
Made Ground	Gras over grey and brown blue grey slightly sandy gravelly clay. Gravel comprises mudstone, sandstone and ash.	0.30 to 1.2
Made Ground (locally)	Yellow brown and blue grey sandy gravelly clay with occasional fragments of brick.	0.6 to 1.3
Made Ground	Up to 3 layers proved of blue grey slightly sandy gravelly clay with gravel and cobble sized fragments of mudstone, coal, and sandstone.	27.4
Possible weathered Coal Measures (TP16) only	Blue grey occasional light green mottled and grey GRAVEL, COBBLES and BOULDERS of mudstone and sandstone.	>2.10
Weathered coal measures	Medium Strong and strong grey and light grey fine and medium SANDSTONE	Not proved
Groundwater	8.90mbgl	N/A

8.2 Details of the ground and groundwater conditions encountered are given on the exploratory hole records included in Appendix B and are summarised in the sections below:

Made Ground

8.3 Made Ground was encountered across the site and was noted to comprise up to 4 layers of compacted material's comprised sandy gravelly clay over slightly sandy gravel with some cobbles and boulders of mudstone. Localised fragments of brick and ash were also encountered. These materials were proved to depths to in excess of 4.45mbgl.

8.4 Numerous cobbles and boulders of mudstone and sandstone were encountered some of which also contained carbonised coal, however there was no structure encountered indicating these are part of the backfill rather than natural materials.

Possible Middle Coal Measures

8.5 Possible weathered Mudstone was encountered in trial pit TP16 and below 0.70m bgl. And comprised blue grey occasional light green grey gravel cobbles and boulders of sandstone and mudstone.

Middle Coal Measures

8.6 Middle Coal Measures were encountered in BH01 and below 28.70mbgl and comprised Medium strong to strong grey and light grey fine to medium Sandstone. Numerous sub horizontal closely to medium spaced fractures were encountered.

Visual and Olfactory Evidence of Contamination

8.7 No visual or olfactory evidence of contamination was encountered with the exception of fly tipped materials across parts of the site.

Soil Strength

8.8 The consistency of the reworked materials and the granular Made Ground ranged from medium dense to very dense.

8.9 The strength of the underlying Middle Coal Measures ranged from medium strong to strong.

Groundwater

8.10 Groundwater was not encountered during the site works. Subsequent monitoring visits are summarised below:

Exploratory Hole	Depth m(bgl)				
	Site Works	10-9-14	16-9-14	26-9-14	6-11-14
WS1	Dry	Dry	Dry	4.2 (Dry)	Dry
WS2	Dry	Dry	Dry	Dry	Dry
WS3	Dry	Dry	Dry	Dry	Dry
WS4	Dry	Dry	Dry	3.95m (Dry)	Dry
WS5	Dry	Dry	Dry	Dry	Dry
BH01	Strike 10.50m bgl rose to 8.70mbgl	-	-	-	8.90m bgl

Ground Gas

8.11 Ground gas was monitored during the return visits and the results are summarised on the table below:

Exploratory Hole	Atmos pressure (Mb)	Flow (l/hr)	CH4		CO2		O2
			Concentration (%)	GSV (l/hr)	Concentration (%)	GSV (l/hr)	Concentration (%)
10-9-15							
WS1	1018	<0.1	<0.1	<0.0001	12.2	<0.0122	9.2
WS2	1018	<0.1	<0.1	<0.0001	0.0	<0.0001	20.7
WS3	1018	<0.1	<0.1	<0.0001	3.2	<0.0032	17.0
WS4	1018	<0.1	<0.1	<0.0001	16.0	<0.0160	1.1
WS5	1018	<0.1	<0.1	<0.0001	7.3	<0.0073	13.2
16-9-14							

WS1	1012	<0.1	<0.1	<0.0001	7.0	<0.0070	14.3
WS2	1012	<0.1	<0.1	<0.0001	0.0	<0.0001	21.1
WS3	1012	<0.1	<0.1	<0.0001	1.2	<0.0012	18.7
WS4	1012	<0.1	<0.1	<0.0001	14.9	<0.0149	3.0
WS5	1012	<0.1	<0.1	<0.0001	7.5	<0.0075	11.0
26-9-14							
WS1	1019	<0.1	<0.1	<0.0001	3.7	<0.0037	14.3
WS2	1019	<0.1	<0.1	<0.0001	1.1	<0.0011	21.1
WS3	1019	<0.1	<0.1	<0.0001	0.3	<0.0003	18.7
WS4	1019	<0.1	<0.1	<0.0001	0.5	<0.0005	3.0
WS5	1019	<0.1	<0.1	<0.0001	3.3	<0.0033	11.0

- 8.12 Where gas concentrations exceed 1% by volume methane or 5% by volume carbon dioxide the concentrations are coloured orange. If concentrations are lower the values are coloured green. Where gas flux meets characteristic situation 1 the GSV is coloured green. The GSV is coloured yellow for Characteristic Situation 2 and red for Characteristic Situation 3 and above.

9.0 CONTAMINATION ASSESSMENT

General

- 9.1 A Tier I risk assessment has been undertaken using available and current screening values for human health and where appropriate controlled waters. The risk assessment is undertaken based on the findings of the preliminary conceptual model presented in Section 6. Based on the contamination testing and Tier I assessment a revised Conceptual Model has been prepared, which is presented later in this section.
- 9.2 Where significant risks are identified remedial measures are recommended.

Human Health

- 9.3 Assessment of the risks to human health has been undertaken by comparing the soil quality data with reference values obtained from the Contaminated Land Exposure Assessment (CLEA), Soil Guideline Values (SGV) and General Acceptance Criteria (GAC) published by LQM/CIEH. A summary table of the reference values is included in Appendix C.
- 9.4 Where an exceedance is identified the risk is assessed by considering the sensitivity of the proposed development and the potential pathway. Given the limited contact time by site users it is considered that the GAC values for commercial end use is applicable for the proposed development.
- 9.5 Results of the chemical testing are included in Appendix C. In addition to the laboratory sheets there is a sheet with the results coloured. Where results are coloured green these are below the GAC. Values coloured red exceed the GAC.
- 9.6 Environmental samples were taken from the Made Ground and where possible from the materials that identified visual signs of contamination.
- 9.7 The soil quality shows no exceedances above the reference GAC value from commercial land usage and no asbestos was detected.

Controlled Waters

- 9.8 Where groundwater samples have been analysed the results are compared against reference values. These reference values are summarised in Appendix C and are taken from Fresh Water Environmental Quality Standards (EQS), UK Drinking Water Standards and World Health Organisation (WHO) values for Drinking Water.

9.9 Where the controlled waters receptor is a surface water course then the EQS are used as the primary reference value. Drinking Water Standards and WHO values are used where EQS values are not available. An assessment of likely risk is then made based on a source-pathway-receptor model. Where the receptor is potable groundwater resources the Drinking Water Standards and WHO values are used.

9.10 As groundwater could not be undertaken from the window sampling leachate analysis from the Made Ground has been carried out. This leachate result has been compared against freshwater EQS values to assess if there is any risk to the identified groundwater. This assessment generally shows concentrations of determinants to be below the EQS, with the exception of the following:

Determinant	EQS (ug/l)	Location	Concentration (ug/l)
Fluoranthene	0.02	TP5 0.30m and WS2	0.02

9.11 Given they do not exceed the EQS and given the location of these samples in excess of 50m from a surface water it is considered that the Fluoranthene will naturally disperse before affecting the receptors and therefore the groundwater risk has been dismissed.

9.12 To confirm this a ground water sample was collected from the deep rotary borehole installation. This groundwater has been compared against freshwater EQS values to assess if there is any risk to the identified groundwater. This assessment generally shows concentrations of determinants to be below the EQS, with the exception of the following:

Determinant	EQS (ug/l)	Location	Concentration (ug/l)
Fluoranthene	0.02	BH01 8.90	0.04

9.13 Samples of groundwater collected from the borehole installation have been compared against the EQS values included above. The only exceedance was fluoranthene (0.04ug/l) which exceeds the EQS value of 0.02ug/l. Given this is the only a marginally exceedance and there are no abstractions or source protection zones within 1000m of the site it is considered that the risk to controlled waters can be dismissed.

Ground Gas

- 9.14 Following the guidance provided in CIRIA C665 an initial assessment is undertaken to determine if there are any significant sources of potential ground gas. Such sources include landfills, organic clays and made ground incorporating putrescible materials such as rags, paper and wood. Where no significant source is identified no further assessment is necessary.
- 9.15 Where significant potential risk from ground gas has been identified from the Initial Conceptual Model and the intrusive ground investigation works ground gas monitoring is undertaken and the results of the monitoring are compared against the Gas Screening Values given in CIRIA Report 665. From this the Characteristic Situation is identified and remedial measures proposed.
- 9.16 When assessing the risk and type of remedial measures appropriate consideration is given to the likely construction of the development, the nature of the gas posing a risk and the nature of the likely source. The use of engineering judgement when determining risk from ground gas is consistent with the recommendations given in CIRIA C665.
- 9.17 No significant sources of ground gas were noted from the desk study, however substantial Made Ground was encountered on site but this did not include putrescible materials. As such there is not considered to be a significant risk from ground gas. Similarly coal gas has also been potentially identified however given the depth of the coal workings and the fact they have been worked and covered with backfill materials in excess of 40m thick there is limited potential for gas to migrate to surface unless a pathway is provided. Such a pathway could be the piles which are proposed.
- 9.18 Monitoring was undertaken during the 4 return visits to monitor groundwater levels and gas. Ground gas has not recorded elevated concentrations of Methane, however has recorded elevated Carbon Dioxide above 5%. No detectable gas flow rates were measured with the gas flux falling into Characteristics Situation 1. This is consistent with site observations showing Made Ground with no putrescible material. Therefore the potential risk from ground gas is dismissed.

Revised Conceptual Model

- 9.19 The Initial Conceptual Model presented in Section 6 has been revised based on the findings of the ground investigation and the revised Conceptual Model is presented overleaf:

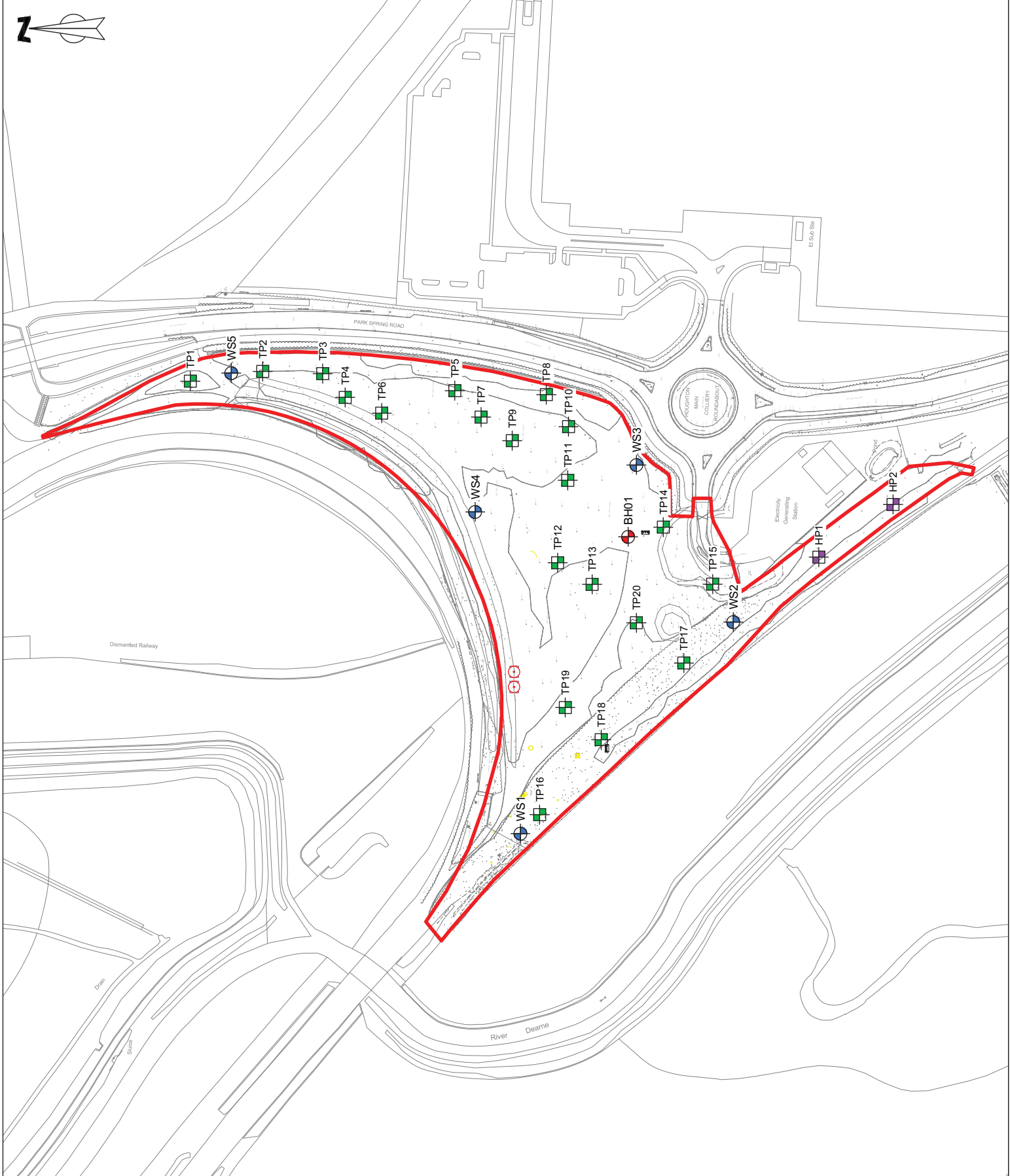
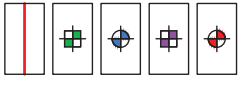
Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Asbestos, metals and hydrocarbons	Unforeseen contamination.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Normal construction PPE will address risk under CDM.
			Site users.	Negligible.	Discovery Strategy.
Asbestos	Made Ground	Inhalation	Construction Workers.	Dismissed.	No exceedance of GAC.
			Site users.		
Metals and hydrocarbons.	Made Ground.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed	No exceedance of GAC.
			Site users.		
Hydrocarbon and metals.	Potential localised spillage on site.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No exceedance of GAC.
			Site users.		
Hydrocarbon and metals.	Potential migration from off-site source.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No exceedance of GAC at boundary
			Site users.		
Ground Gas.	Landfills	Inhalation & Explosive.	Construction Workers.	Dismissed.	Characteristic Situation1 supported by assessment of risk and gas monitoring
			Site users.		
	Made Ground.	Inhalation & Explosive.	Construction Workers.		
			Site users.		
Groundwater					
Hydrocarbon and metals.	Potential spillage on site.	Vertical Migration.	Groundwater.	Dismissed	No hydrocarbon source exceeding GAC
Surface Water					
Hydrocarbon and metals.	Potential spillage on site.	Horizontal Migration.	River Network.	Dismissed.	No source.
Environmental Receptors					
On site contaminants		Ingestion dermal and inhalation.	Ecology.	Dismissed.	No sensitive ecology designation.
		Direct.	Archaeology.	Dismissed.	None present.
		Direct.	Geology.	Dismissed.	None present.
		Phytotoxic.	Woodland.	Dismissed.	None present.
		Phytotoxic.	Crops.	Dismissed.	None present.
		Ingestion dermal and inhalation.	Livestock.	Dismissed.	None present.
Building Services					
On site contaminants		Direct.	Historic Buildings.	Dismissed.	None present.
		Direct.	Proposed Buildings.	Dismissed.	No source identified.
		Permeate into pipework.	Water Pipes.	Dismissed.	No source identified.

Remediation

9.20 No Remediation required.

9.21 If unforeseen contamination is encountered during construction works such as localised spillage outside the areas investigated an Environmental consultant will be available on a 'call out' basis to undertake an assessment of risk. If 'unforeseen contamination' is encountered the discovery strategy will be to remove the source as it is likely to be very limited in extent and the Local Planning Authority advised.

Key



STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT:	Peel Environmental Ltd
PROJECT REF:	CRM.066.001
SCALE:	1:2,000@A3
DRAWN:	MG
CHECKED:	RH
DATE:	Nov 2014
PROJECT:	Houghton Main
TITLE:	Site Plan
FIGURE NO.:	CRM.066.001.GE.D.001

County Series 1:10,560 scale

VEGETATION

ROADS

RAILWAYS

--	--

GENERAL FEATURES

BOUNDARIES

National Grid 1:10,000 scale

HEIGHTS (METRES)

Values are given in metres above mean sea level at Newlyn.

Surface heights determined by ground survey

Vertical bench marks and bench mark lists containing fuller and possibly later levelling information are obtainable from the Director General, Ordnance Survey.

Contours are at 5 metres vertical interval.

ROCK FEATURES

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ABBREVIATIONS

BP/BS	Boundary Post or Stone	PO	Post Office
Ch	Church	PC	Public Convenience
CH	Club House	PH	Public House
F Sta	Fire Station	S	Stone
FB	Foot Bridge	Spr	Spring
Fn	Fountain	TCB	Telephone Call Box
GP	Guide Post	TCP	Telephone Call Post
MP/MS	Mile Post or Stone	TH	Town Hall
P	Pole or Post	W	Well
Pol Sta	Police Station	Y	Youth hostel

ROADS

--	--	--

Where unfenced shown by piked lines.

RAILWAYS

GENERAL FEATURES

VEGETATION

In some areas bracken (T) and rough grassland (V) are shown separately.

GroundSure

Historical Map Pack Legend

County Series & National Grid

1:10,560 scale & 1:10,000 scale

Information present on these legends is sourced from the same Ordnance Survey mapping as the maps used in this product.

If you have a query regarding any of the maps provided please contact GroundSure's technical helpline. We will endeavour to answer any queries you may have.

Technical Helpline
 Tel: 01273 819 700
maps&data@groundsure.com
www.groundsure.com



EmapSite
Masdar House, ,
Eversley, RG27 ORP

GroundSure Reference: EMS-245265_329172

Your Reference: EMS_245265_329172

Report Date 8 Apr 2014

Report Delivery Method: Email - pdf

GroundSure EnviroInsight

Address: ,

Dear Sir/ Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure Enviroinsight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
GroundSure EnviroInsight



GroundSure Envirolnsight

Address: ,
Date: 8 Apr 2014
Reference: EMS-245265_329172
Client: EmapSite

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 26-Mar-2012
Grid Reference: 441652,406467
Site Size: 5.85ha

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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Environmental Permits, Incidents and Registers						
	On-site	0-50m	51-250	251-500		
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
1.1.1 Records of historic IPC Authorisations	0	0	0	0		
1.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0		
1.1.3 Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0		
1.1.4 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0		
1.1.5 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0		
1.1.6 Records of List 2 Dangerous Substances Inventory sites	0	0	1	1		
1.1.7 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	0		
1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0		
1.1.9 Records of Licensed Discharge Consents	1	0	4	18		
1.1.10 Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0		
1.2 Records of COMAH and NIHHS sites	0	0	0	0		
1.3 Environment Agency Recorded Pollution Incidents						
1.3.1 National Incidents Recording System, List 2	0	0	0	0		
1.3.2 National Incidents Recording System, List 1	0	0	0	0		
1.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0		
Section 2: Landfill and Other Waste Sites						
	On-site	0-50m	51-250	251-500	501-1000	1000-5000
2.1 Landfill Sites						
2.1.1 Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
2.1.2 Environment Agency Historic Landfill Sites	0	0	0	0	2	2
2.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	1	0
2.1.4 GroundSure Local Authority Landfill Sites Data	0	0	0	0	0	0
2.2 Landfill and Other Waste Sites Findings						
2.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	1	Not searched	Not searched
2.2.2 Environment Agency Licensed Waste Sites	0	0	0	0	0	2

Section 3: Current Land Use	On-site	0-50m	51-250	251-500
3.1 Current Industrial Sites Data	0	0	1	Not searched
3.2 Records of Petrol and Fuel Sites	0	0	0	0
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0

Section 4: Geology

4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	Yes
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 5: Hydrogeology and Hydrology

	0-500m
5.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
5.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
5.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
5.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	2
5.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
5.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
5.7 Is there any Environment Agency information on river quality within 1500m of the study site?	Yes	No	No	No	No	Yes
5.8 Detailed River Network entries within 500m of the site	0	4	4	15	Not searched	Not searched
5.9 Surface water features within 250m of the study site	No	Yes	Yes	Not searched	Not searched	Not searched

Section 6: Flooding

6.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	Yes
6.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site?	Yes
6.3 Are there any Flood Defences within 250m of the study site?	Yes
6.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
6.5 Are there any areas used for Flood Storage within 250m of the study site?	Yes
6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential at Surface
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

Section 7: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	1
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
7.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
7.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
7.5 Records of Ramsar sites	0	0	0	0	0	0
7.6 Records of Ancient Woodlands	0	0	0	0	2	4
7.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	1
7.8 Records of World Heritage Sites	0	0	0	0	0	0
7.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
7.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
7.11 Records of National Parks	0	0	0	0	0	0
7.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
7.13 Records of Nitrate Vulnerable Zones	1	0	0	0	0	1

Section 8: Natural Hazards

8.1 What is the maximum risk of natural ground subsidence?

Moderate

Section 9: Mining

9.1 Are there any coal mining areas within 75m of the study site?

Yes

9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site?

Low-Moderate

9.3 Are there any brine affected areas within 75m of the study site?

No

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client. The document contains the following sections:

1. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

2. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

3. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure underground oil and gas pipelines.

4. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

5. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

6. Flooding

Provides information on surface water flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

7. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

8. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence.

9. Mining

Provides information on areas of coal and shallow mining.

10. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, GroundSure provide a free Technical Helpline (08444 159000) for further information and guidance.

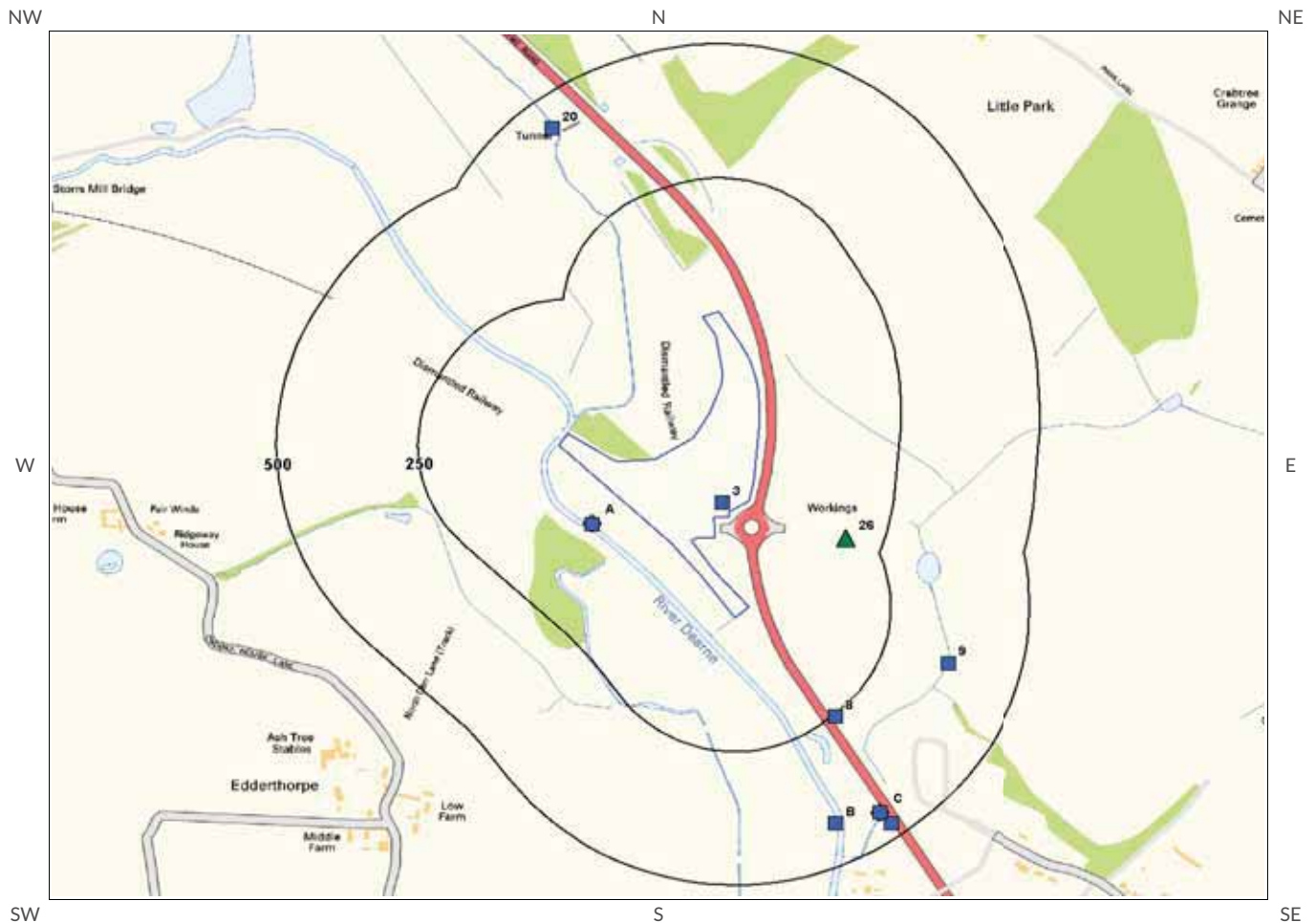
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Environmental Permits, Incidents and Registers Map



Environmental Permits, Incidents and Registers Legend



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- | | | | | | |
|--|-----------------------------|--|---------------------------------------|--|--|
| | Site Outline | | Recorded Pollution Incident | | RAS 3 & 4 Authorisations |
| | Search Buffers (m) | | Dangerous Substances (List 1) | | Part A(1) Authorised Processes and Historic IPC Authorisations |
| | | | Dangerous Substances (List 2) | | Part A(2) and Part B Authorised Processes |
| | Water Industry Referrals | | Licenced Discharge Consents | | COMAH / NIHHS Sites |
| | Red List Discharge Consents | | Sites Determined as Contaminated Land | | Hazardous Substance Consents and Enforcements |



1. Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

1.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

1.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

1.1.3 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

1.1.4 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

1.1.5 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

1.1.6 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

2

The following List 2 Dangerous Substance Inventory Site records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
1A	70.0	SW	441470 406360	Name: Rjb Mining Ltd - Outlet D2 - Sw Status: Not Active Receiving Water: River Dearne Authorised Substances: Iron
2C	446.0	SE	441980 405820	Name: Rjb Mining Ltd, Houghton Outlet D1 Status: Not Active Receiving Water: River Dearne Authorised Substances: Iron

1.1.7 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

1

The following Part A(2) and Part B Activities are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
26	186.0	SE	441919 406331	Address: Rjb Mining Houghton Main Occs, Little Houghton, Barnsley, S72 0HY Process: Coal/gypsum/carbon Process Status: Historical Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

1.1.9 Records of Licensed Discharge Consents within 500m of the study site:

23

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
3	0.0	On Site	441700 406400	Address: Houghton Main, Sandhill, Barnsley, South Yorkshire Effluent Type: Trade Discharges - Unspecified Permit Number: 3712 Permit Version: 1 Receiving Water: - Status: Revoked - Unspecified Issue date: 12/9/1983 Effective Date: 12/9/1983 Revocation Date: -

ID	Distance	Direction	NGR	Details	
4A	70.0	SW	441470 406360	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit) Permit Number: WRA7231 Permit Version: 1	Receiving Water: River Dearne Status: New Consent, By Application (wra 91, Section 88) Issue date: - Effective Date: - Revocation Date: 7/5/1997
5A	70.0	SW	441470 406360	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit) Permit Number: WRA7231 Permit Version: 2	Receiving Water: River Dearne Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 8/5/1997 Effective Date: 8/5/1997 Revocation Date: 11/6/2002
6A	70.0	SW	441470 406360	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit) Permit Number: WRA7231 Permit Version: 2	Receiving Water: River Dearne Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 8/5/1997 Effective Date: 8/5/1997 Revocation Date: 11/6/2002
7A	70.0	SW	441470 406360	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit) Permit Number: WRA7231 Permit Version: 1	Receiving Water: River Dearne Status: New Consent, By Application (wra 91, Section 88) Issue date: - Effective Date: - Revocation Date: 7/5/1997
8	255.0	SE	441900 406000	Address: Ncb,houghton Main Colliery, Surface, Drainage Interceptor Effluent Type: Trade Discharges - Unspecified Permit Number: 3505 Permit Version: 1	Receiving Water: - Status: Revoked - Unspecified Issue date: 12/9/1983 Effective Date: 12/9/1983 Revocation Date: 15/2/1991
9	367.0	E	442100 406100	Address: Ncb,houghton Main Colliery, Surface, Drainage Interceptor Effluent Type: Trade Discharges - Unspecified Permit Number: 3505 Permit Version: 1	Receiving Water: - Status: Revoked - Unspecified Issue date: 12/9/1983 Effective Date: 12/9/1983 Revocation Date: 15/2/1991
10 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: E284 Permit Version: 3	Receiving Water: River Dearne Status: Transferred From Copa 1974 Issue date: 12/7/1985 Effective Date: 12/7/1985 Revocation Date: 18/8/1997
11 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: E284 Permit Version: 2	Receiving Water: River Dearne Status: Transferred From 1978 Order Issue date: 1/6/1981 Effective Date: 1/6/1981 Revocation Date: 11/7/1985
12 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: E284 Permit Version: 1	Receiving Water: River Dearne Status: Transferred From R(pp)a 1951-1961 Issue date: 8/11/1973 Effective Date: 8/11/1973 Revocation Date: 31/5/1981
13 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Final/treated Effluent - Water Company Permit Number: E284 Permit Version: 4	Receiving Water: River Dearne Status: Varied By Application - (wra 91 Sched 10 - As Amended By Env Act 1995) Issue date: 19/8/1997 Effective Date: 19/8/1997 Revocation Date: -
14 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Final/treated Effluent - Water Company Permit Number: E284 Permit Version: 1	Receiving Water: River Dearne Status: Transferred From R(pp)a 1951-1961 Issue date: 8/11/1973 Effective Date: 8/11/1973 Revocation Date: 31/5/1981

ID	Distance	Direction	NGR	Details	
15 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: E284 Permit Version: 5	Receiving Water: River Dearne Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 11/3/2005 Effective Date: - Revocation Date: 27/6/2008
16 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: E284 Permit Version: 4	Receiving Water: River Dearne Status: Varied By Application - (wra 91 Sched 10 - As Amended By Env Act 1995) Issue date: 19/8/1997 Effective Date: 19/8/1997 Revocation Date: -
17 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Final/treated Effluent - Water Company Permit Number: E284 Permit Version: 5	Receiving Water: River Dearne Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 11/3/2005 Effective Date: - Revocation Date: 27/6/2008
18 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Final/treated Effluent - Water Company Permit Number: E284 Permit Version: 2	Receiving Water: River Dearne Status: Transferred From 1978 Order Issue date: 1/6/1981 Effective Date: 1/6/1981 Revocation Date: 11/7/1985
19 B	423.0	SE	441900 405800	Address: Little Houghton Stw, Little Houghton, Barnsley, South Yorkshire Effluent Type: Sewage Discharges - Final/treated Effluent - Water Company Permit Number: E284 Permit Version: 3	Receiving Water: River Dearne Status: Transferred From Copa 1974 Issue date: 12/7/1985 Effective Date: 12/7/1985 Revocation Date: 18/8/1997
20	442.0	NW	441400 407100	Address: Barnsley Metropolitan Borough Counc, II, New Park Springs Colliery Ti, P, Grimethorpe, Nr. Barnsley, So, Uth Yorkshire Effluent Type: Trade Discharges - Unspecified Permit Number: C4539 Permit Version: 1	Receiving Water: - Status: Revoked - Unspecified Issue date: 18/2/1987 Effective Date: 18/2/1987 Revocation Date: 25/5/1993
21 C	446.0	SE	441980 405820	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit Permit Number: WRA7231 Permit Version: 1	Receiving Water: River Dearne Status: New Consent, By Application (wra 91, Section 88) Issue date: - Effective Date: - Revocation Date: 7/5/1997
22 C	446.0	SE	441980 405820	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit Permit Number: WRA7231 Permit Version: 2	Receiving Water: River Dearne Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 8/5/1997 Effective Date: 8/5/1997 Revocation Date: 11/6/2002
23 C	446.0	SE	441980 405820	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit Permit Number: WRA7231 Permit Version: 2	Receiving Water: River Dearne Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 8/5/1997 Effective Date: 8/5/1997 Revocation Date: 11/6/2002
24 C	446.0	SE	441980 405820	Address: Houghton Main Occs, Consent Wra7231, South Yorkshire Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit Permit Number: WRA7231 Permit Version: 1	Receiving Water: River Dearne Status: New Consent, By Application (wra 91, Section 88) Issue date: - Effective Date: - Revocation Date: 7/5/1997
25 C	474.0	SE	442000 405800	Address: Houghton Main Colliery, Ncb Mw (cea, Sed) Effluent Type: Trade Discharges - Unspecified Permit Number: E 878 Permit Version: 1	Receiving Water: No Details Status: Consent Revoked - Discharge Ceased (wra 91, Sched 10 & 6) Issue date: 13/6/1983 Effective Date: 13/6/1983 Revocation Date: 13/8/1992

1.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

0

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

1.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

0

Database searched and no data found.

1.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

1.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site?

0

Database searched and no data found.

2. Landfill and Other Waste Sites Map



Landfill and Other Waste Sites Legend



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- | | | | | | |
|--|--------------------|--|--------------------------|--|----------------------------------|
| | Site Outline | | E.A. Active Landfill | | Historic and Planned Waste Sites |
| | Search Buffers (m) | | E.A. Historic Landfill | | E.A. Licensed Waste Site |
| | | | Local Authority Landfill | | BGS / DoE Survey Landfill |



2. Landfill and Other Waste Sites

2.1 Landfill Sites

2.1.1 Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

2.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

4

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
Not shown	713.0	NE	442100 407400	Site Address: Quarry, Park Lane, Great Houghton, Near Barnsley, South Yorkshire Waste Licence: - Site Reference: - Waste Type: Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: Hemsworth Rural District Council
Not shown	771.0	NW	441100 407600	Site Address: National Coal Board, New Park Spring Tip, Grimethorpe, Barnsley Waste Licence: Yes Site Reference: 20B160(45), 4400/B1060, WD20 B160, 20B1060, 4400/0448 Waste Type: IndustrialLiquid sludge, Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 17-Nov-1977 Licence Surrendered: 22-Feb-1996 Licence Hold Address: Coalite Works, Grimethorpe, Barnsley Operator: Coalite and Chemical Products
Not shown	1156.0	N	441400 407900	Site Address: Part of New Park Spring Tip, Wood Lane, Grimethorpe, Barnsley Waste Licence: Yes Site Reference: WD20 B175, 4400/B175, 20B175 Waste Type: Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 11-Jan-1978 Licence Surrendered: 10-Feb-1993 Licence Hold Address: Barnsley Area, Grimethorpe, Barnsley Operator: -
Not shown	1403.0	N	441100 408100	Site Address: Carlton Main Brickworks, Off Wood Lane, Grimethorpe, Barnsley, South Yorkshire Waste Licence: Yes Site Reference: WD20/B479, NE4242 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: YQ1/L/CAR001 Licence Issue: 21-Oct-1985 Licence Surrendered: 23-Aug-2005 Licence Hold Address: - Operator: -

2.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	677.0	NE	44210 0.0 40730 0.0	Address: Quarry, Park Lane, Gt Houghton, nr Barnsley BGS Number: 2524.0	Risk: No risk to aquifer Waste Type: N/A

2.1.4 Records of Local Authority landfill sites within 1500m of the study site:

0

Database searched and no data found.

2.2 Other Waste Sites

2.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
2	344.0	E	442350 406195	Type of Site: Ground Workings and Refuse Heap Site Address: N/A	Planning Application Reference: N/A Date: 1961	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon

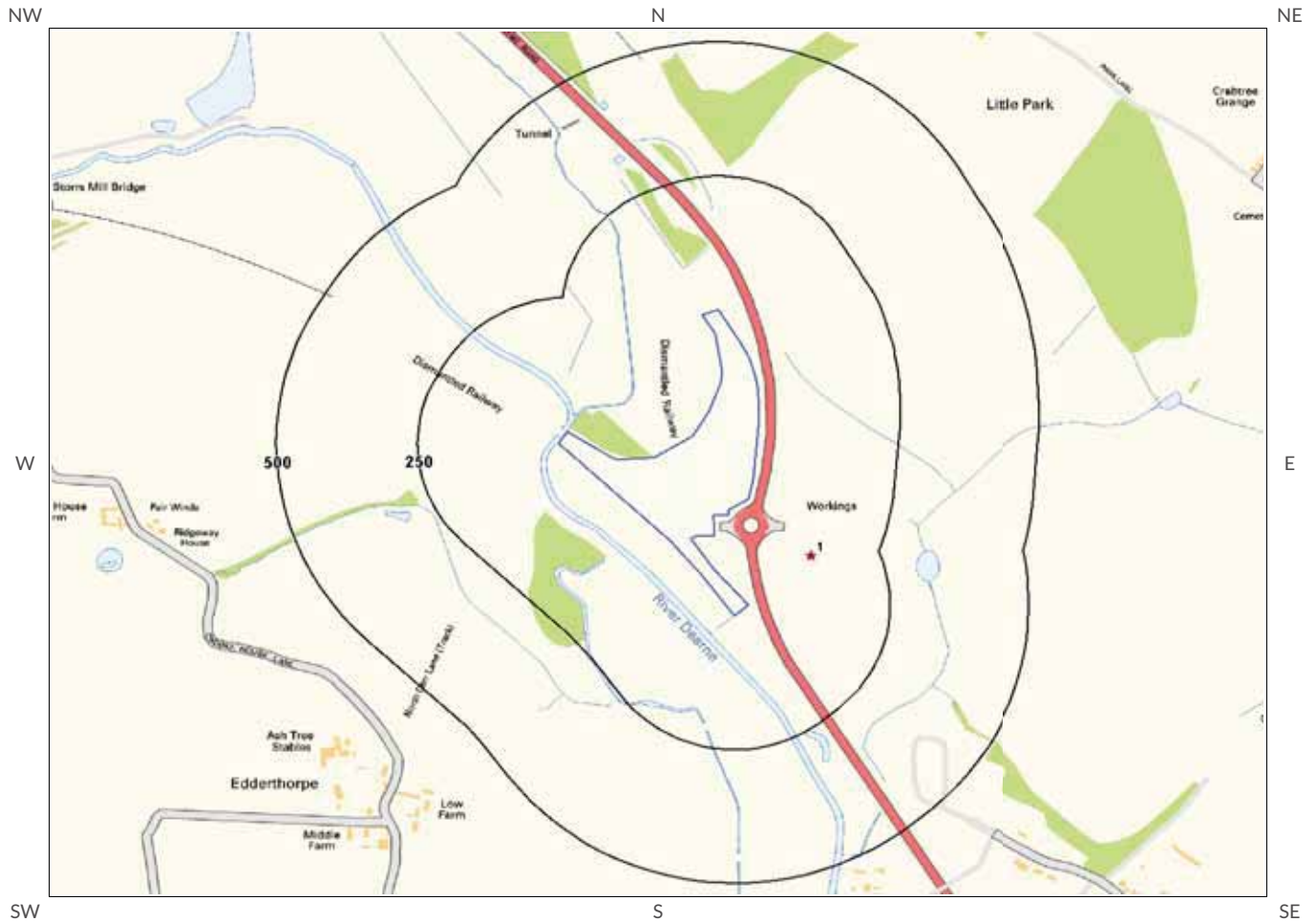
2.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

2

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1472.0	N	441400 408200	Site Address: High Street, Grimethorpe, South Yorkshire, S72 7BG Type: Inert LF Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CAR172 EPR reference: EA/EPR/VP3238LC/ Operator: Carlton Main Brickworks Limited Waste Management licence No: 210082 Annual Tonnage: 0.0	Issue Date: 27/09/2007 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Carlton Brick Landfill Site Correspondence Address: -, High Street, Grimethorpe, South Yorkshire, S72 7BG
Not shown	1472.0	N	441400 408200	Site Address: Land / Premises At, High Street, Grimethorpe, South Yorkshire, S72 7BG Type: Inert LF Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CAR172 EPR reference: EA/EPR/VP3238LC/A001 Operator: Carlton Main Brickworks Limited Waste Management licence No: 210082 Annual Tonnage: 190000.0	Issue Date: 27/09/2007 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Carlton Brick Landfill Site Correspondence Address: -, -

3. Current Land Use Map



Current Land Use Legend



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 Site Outline

 Current Industrial Sites

 Search Buffers (m)

 Petrol & Fuel Sites

 Underground High Pressure Oil & Fuel Pipelines



3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 1

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	143.0	NE	Electricity Sub Station	441859 406297	S72	Electrical Features	Infrastructure and Facilities

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site: 0

Database searched and no data found.



4. Geology

4.1 Artificial Ground and Made Ground

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

4.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
ALV-CLSI	ALLUVIUM	CLAY AND SILT

4.3 Bedrock and Solid Geology

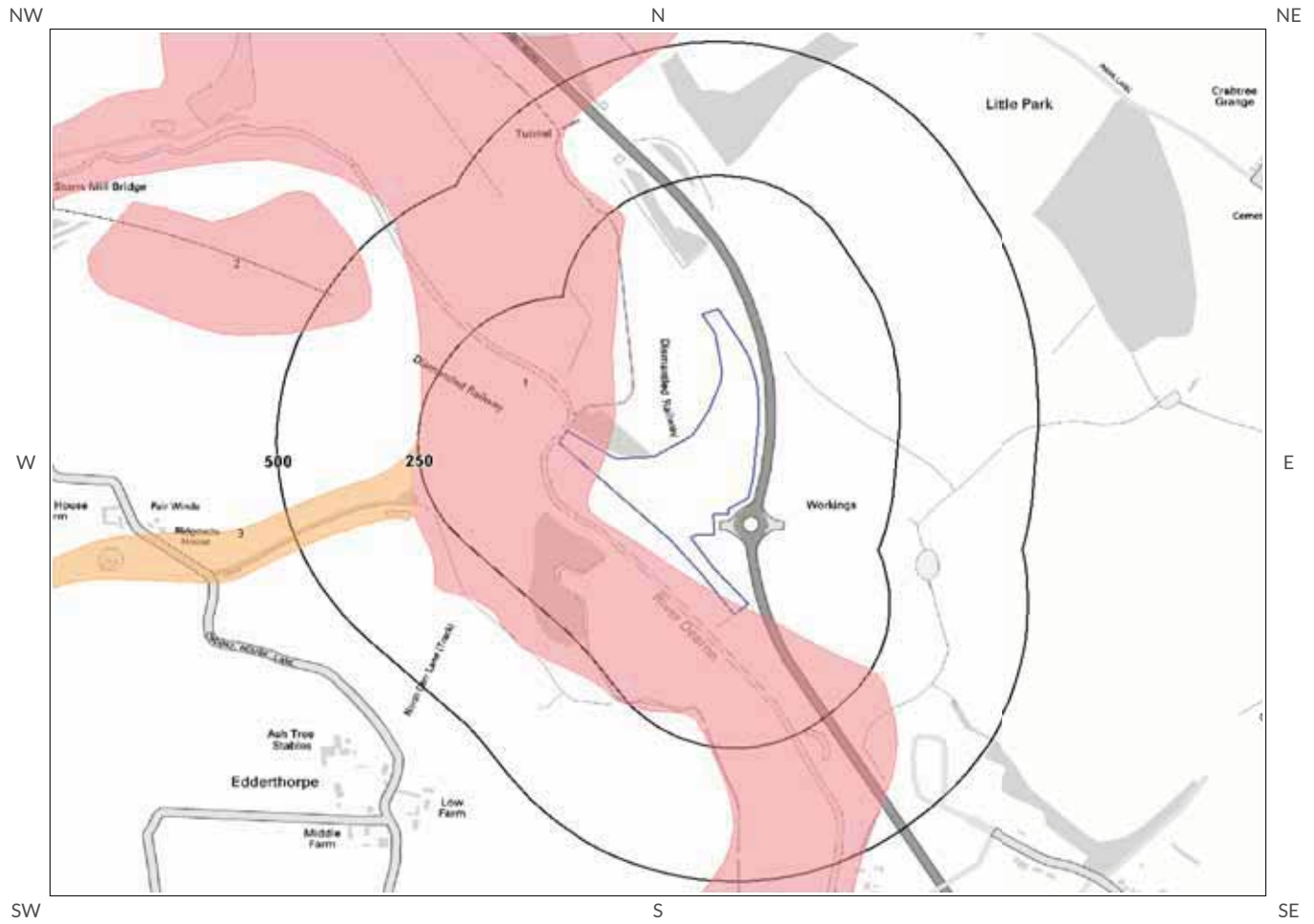
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION	SANDSTONE
PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION	SANDSTONE
PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
MXR-SDST	MEXBOROUGH ROCK	SANDSTONE

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

5. Hydrogeology and Hydrology

5a. Aquifer Within Superficial Geology



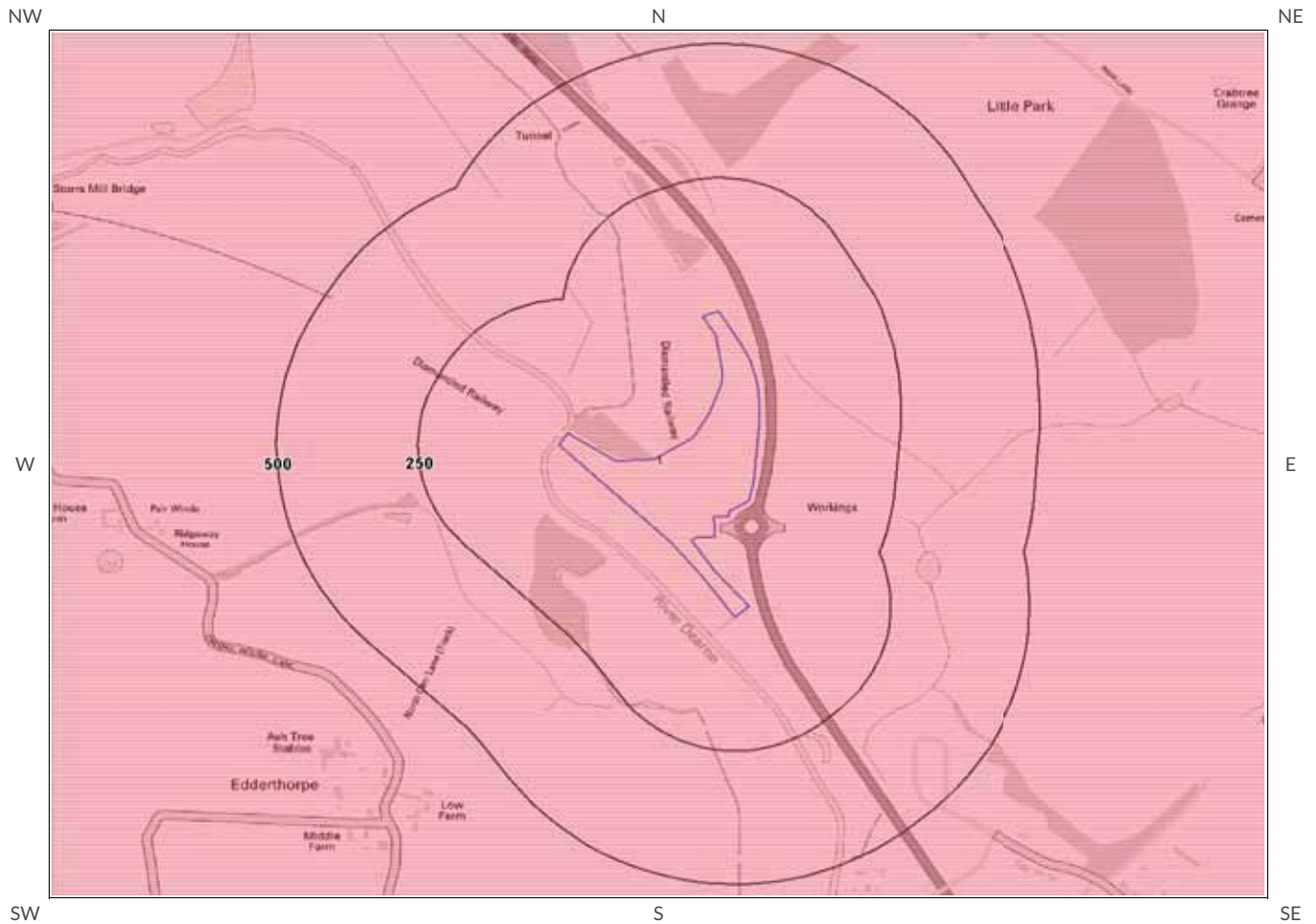
Map Legend



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	Site Outline		Principal Aquifer		Secondary Aquifer - Undifferentiated Layers
	250		Secondary (A) Aquifer - Permeable Layers		Unproductive
	500		Secondary (B) Aquifer - Lower Permeability Layers		Unknown (lakes and landslip)

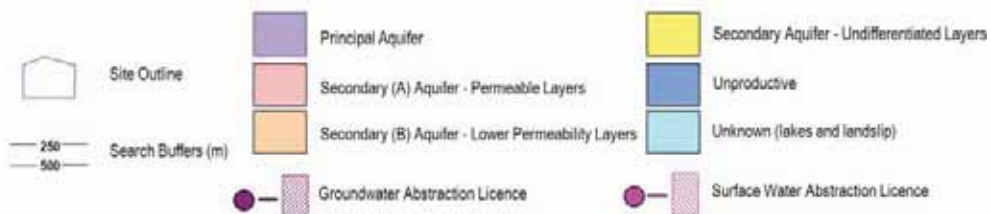
5b. Aquifer Within Bedrock Geology and Abstraction Licenses



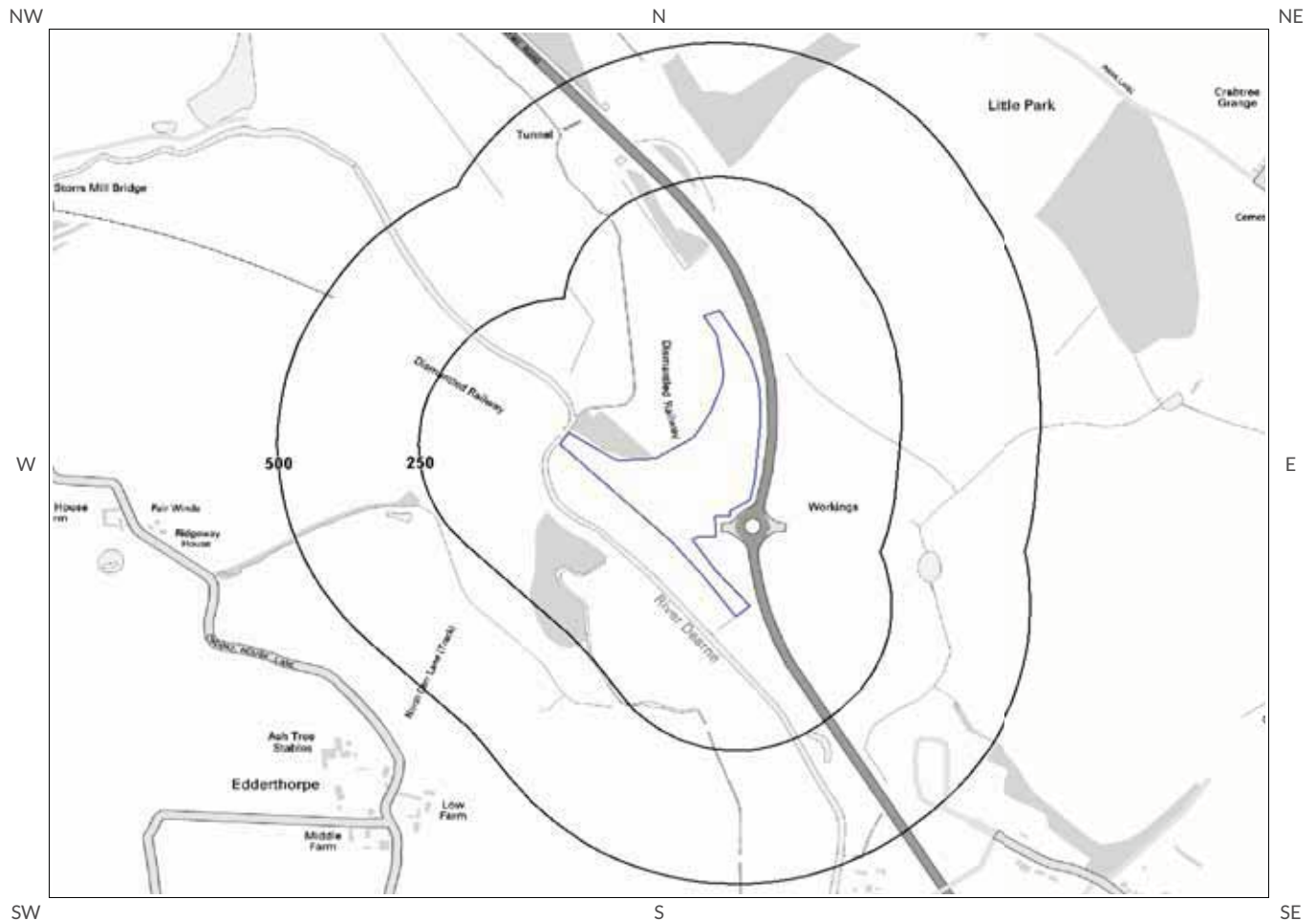
Map Legend



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5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



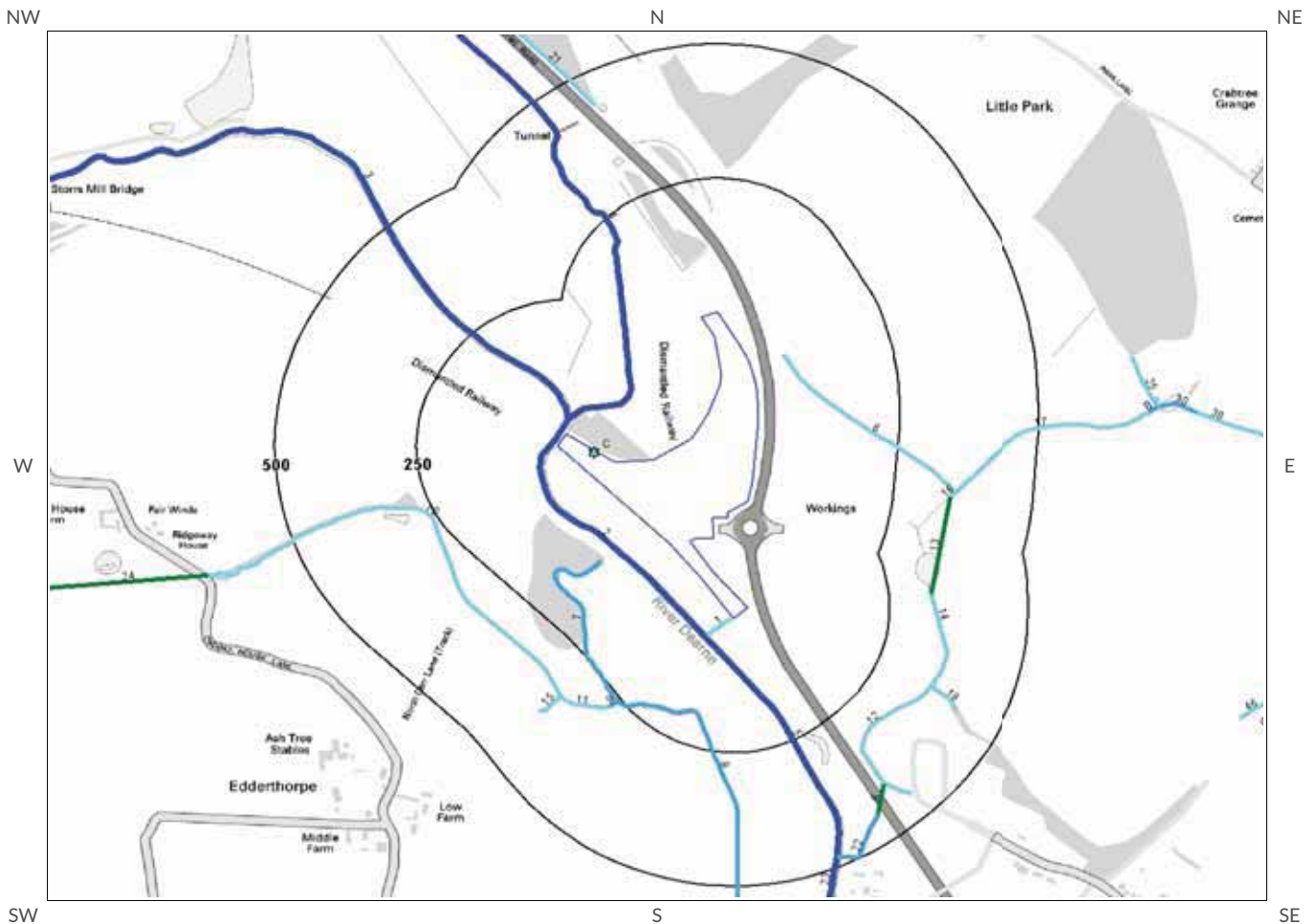
Map Legend



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-  Site Outline
-  Search Buffers (m)
-  Source Protection Zone 1 - Inner Catchment
-  Source Protection Zone 2 - Outer Catchment
-  Source Protection Zone 3 - Total Catchment
-  Source Protection Zone 4 - Zone of Special Interest
-  Potable Water Abstraction Licence

5d. Hydrology – Detailed River Network and River Quality



Map Legend



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- | | | | | | |
|--|------------------------|--|---------------------------------------|--|-------------------------------------|
| | Site Outline | | Primary River | | Canal |
| | 250 Search Buffers (m) | | Secondary River | | Canal Tunnel |
| | 500 Search Buffers (m) | | Tertiary River | | Culvert |
| | | | Lake/Reservoir | | Multiple Channel Culvert |
| | | | Underground River (inferred) | | Underground River (Potential Sewer) |
| | | | General Quality Assessment: Biology | | Underground River (local knowledge) |
| | | | General Quality Assessment: Chemistry | | |



5. Hydrogeology and Hydrology

5.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? **Yes**

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (5a):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
3	252.0	W	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	420.0	NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? **Yes**

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	NGR	Details
Not shown	1246.0	N	441600 408000	Licence No: 2/27/08/137 Details: Mineral Washing Direct Source: Groundwaters Point: Borehole - Coal Measures - Grimethorpe Colliery Data Type: Point Annual Volume (m ³): 430000 Max Daily Volume (m ³): 1600 Original Application No: NPS/WR/002582 Original Start Date: 25/5/2005 Expiry Date: 31/3/2017 Issue No: 3 Version Start Date: 23/11/2009 Version End Date:
Not shown	1829.0	W	439584 406499	Licence No: NE/027/0008/011 Details: Heat Pump Direct Source: Groundwaters Point: Borehole - Coal Measures - Tyers Hall - Barnsley Data Type: Point Annual Volume (m ³): 30000 Max Daily Volume (m ³): 100 Original Application No: NPS/WR/010886 Original Start Date: 19/12/2012 Expiry Date: 31/3/2029 Issue No: 1 Version Start Date: 19/12/2012 Version End Date:
Not shown	1829.0	W	439584 406499	Licence No: NE/027/0008/011 Details: General Farming & Domestic Direct Source: Groundwaters Point: Borehole - Coal Measures - Tyers Hall - Barnsley Data Type: Point Annual Volume (m ³): 30000 Max Daily Volume (m ³): 100 Original Application No: NPS/WR/010886 Original Start Date: 19/12/2012 Expiry Date: 31/3/2029 Issue No: 1 Version Start Date: 19/12/2012 Version End Date:

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	NGR	Details
Not shown	1730.0	W	439770 407050	Licence No: 2/27/08/090 Details: Spray Irrigation - Direct Direct Source: Surface Water Point: River Dearne Data Type: Point Annual Volume (m ³): 180000 Max Daily Volume (m ³): 5278 Application No: 5519 Original Start Date: 25/7/1977 Expiry Date: - Issue No: 101 Version Start Date: 19/7/2004 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1730.0	W	439770 407050	Licence No: 2/27/08/090 Details: Spray Irrigation - Storage Direct Source: Surface Water Point: River Dearne Data Type: Point	Annual Volume (m ³): 180000 Max Daily Volume (m ³): 5278 Application No: 5519 Original Start Date: 25/7/1977 Expiry Date: - Issue No: 101 Version Start Date: 19/7/2004 Version End Date:

5.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? No

Database searched and no data found.

5.7 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? Yes

5.7.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (5d):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
50C	0.0	On Site	441478 406495	River Name: Dearne Reach: Grimethorpe Dike Billingley Dyke End/Start of Stretch: Start of Stretch NGR	D	D	D	D	D
51C	0.0	On Site	441478 406495	River Name: Dearne Reach: Cudworth Dyke Grimethorpe Dike End/Start of Stretch: End of Stretch NGR	D	D	D	D	D

5.7.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (5d):

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
52C	0.0	On Site	441478 406495	River Name: River Dearne Reach: Cudworth Dyke Grimethorpe Dike End/Start of Stretch: End of Stretch NGR	E	E	E	D	D
53C	0.0	On Site	441478 406495	River Name: River Dearne Reach: Grimethorpe Dike Billingley Dyke End/Start of Stretch: Start of Stretch NGR	C	C	C	C	B
Not shown	1129.0	NW	440378 406959	River Name: River Dearne Reach: Cudworth Dyke Grimethorpe Dike End/Start of Stretch: Sample Point NGR	E	E	E	D	D

5.8 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site?

Yes

The following Detailed River Network records are represented on the Hydrology Map (5d):

ID	Distance (m)	Direction	Details
1	4.0	SW	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
2	10.0	NW	River Name: River Dearne Welsh River Name: - Alternative Name: - River Type: Primary River Main River Status: Currently Undefined
3	27.0	N	River Name: River Dearne Welsh River Name: - Alternative Name: - River Type: Primary River Main River Status: Currently Undefined
4	27.0	N	River Name: - Welsh River Name: - Alternative Name: - River Type: Primary River Main River Status: Currently Undefined
5	61.0	SW	River Name: River Dearne Welsh River Name: - Alternative Name: - River Type: Primary River Main River Status: Currently Undefined
6	61.0	E	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
7	107.0	SW	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Secondary River Main River Status: Currently Undefined
8	186.0	S	River Name: - Welsh River Name: - Alternative Name: - River Type: Secondary River Main River Status: Currently Undefined
9	256.0	SW	River Name: - Welsh River Name: - Alternative Name: - River Type: Secondary River Main River Status: Currently Undefined
10	259.0	SW	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
11	273.0	SW	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
12	311.0	SE	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
13	325.0	E	River Name: - Welsh River Name: - Alternative Name: - River Type: Culvert Main River Status: Currently Undefined
14	325.0	E	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
15	331.0	SW	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
16	350.0	E	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
17	355.0	E	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
18	355.0	SE	River Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
19 A	406.0	SE	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Culvert Main River Status: Currently Undefined
20 A	406.0	SE	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined
21	438.0	NW	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
22	446.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
23	480.0	S	River Name: River Dearne Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined

5.9 Surface Water Features

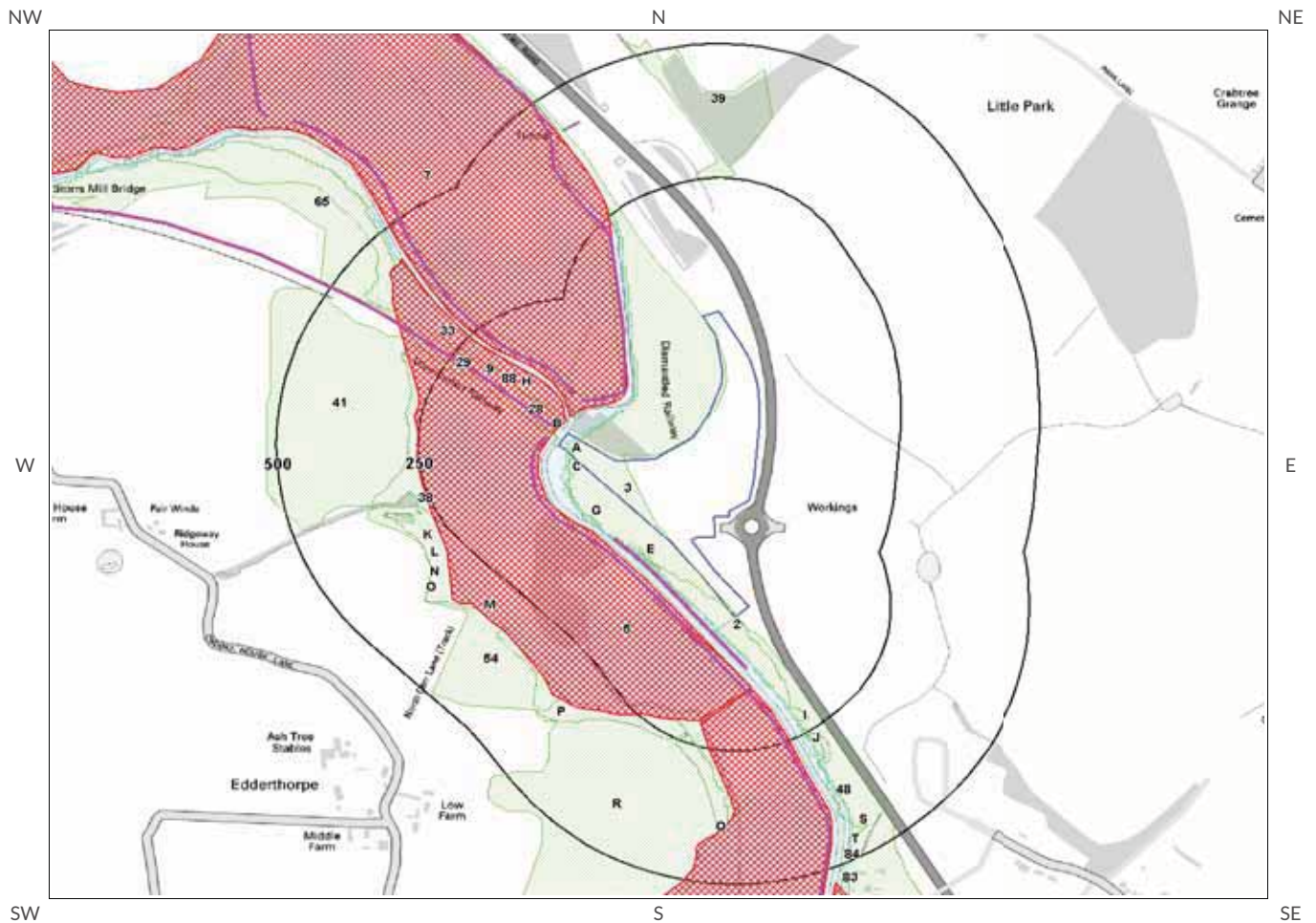
Are there any surface water features within 250m of the study site?

Yes

The following surface water records are not represented on mapping:

Distance (m)	Direction
3.0	NW
3.0	NW
4.0	SW
61.0	E
63.0	S
94.0	N
106.0	SW
113.0	N
119.0	N
187.0	N
217.0	S
219.0	NW
228.0	SE
247.0	SE
249.0	SE









6. Environment Agency Flood Map for planning (from rivers and the sea)



Map Legend



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-  Site Outline
-  250 Search Buffers (m)
-  500 Search Buffers (m)
-  Zone 2 Floodplain
-  Zone 3 Floodplain
-  Flood Storage Area
-  Area Benefiting from Flood Defences
-  Flood Defences



6. Flooding

6.1 Zone 2 Flooding

Environment Agency Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 1 – Environment Agency Flood Map for Planning:

Is the site within 250m of an Environment Agency Zone 2 floodplain? Yes

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance (m)	Direction	Update	Type
1A	0.0	On Site	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
2	0.0	On Site	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
3	0.0	On Site	27-Feb-2014	Zone 2 - (Fluvial Events)
4	0.0	On Site	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
5	0.0	On Site	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial / Undefined Events)
6A	14.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
7	22.0	N	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial / Undefined Events)
8C	22.0	SW	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
9	24.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models)
10B	25.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Undefined Events)
11B	27.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
12C	35.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
13E	49.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial / Undefined Events)
14D	50.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial / Undefined Events)
15D	51.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial / Undefined Events)
16E	51.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
17D	51.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial / Undefined Events)
18D	52.0	SW	27-Feb-2014	Zone 2 - (Fluvial Events)
19D	52.0	SW	27-Feb-2014	Zone 2 - (Fluvial Events)
20D	53.0	SW	27-Feb-2014	Zone 2 - (Fluvial Events)

ID	Distance (m)	Direction	Update	Type
21F	53.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
22F	56.0	SW	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
23G	59.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
24F	63.0	SW	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
25G	64.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
26G	64.0	SW	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
27G	65.0	SW	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
28	65.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Undefined Events)
29	75.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
30H	94.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Undefined Events)
31H	140.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
32H	144.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Undefined Events)
33	150.0	NW	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
34	217.0	SW	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
35I	224.0	SE	27-Feb-2014	Zone 2 - (Fluvial Models and Fluvial Events)
36R	234.0	S	27-Feb-2014	Zone 2 - (Fluvial Events)
37I	237.0	SE	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
38	247.0	W	27-Feb-2014	Zone 2 - (Fluvial / Undefined Events)
39	248.0	N	27-Feb-2014	Zone 2 - (Fluvial Events)

6.2 Zone 3 Flooding

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 1 – Environment Agency Flood Map for Planning.

Is the site within 250m of an Environment Agency Zone 3 floodplain? Yes

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance (m)	Direction	Update	Type
88	0.0	On Site	27-Feb-2014	Zone 3 - (Fluvial Models)

6.3 Flood Defences

Are there any Flood Defences within 250m of the study site? Yes

The following flood defence records are represented as lines on the Flood Map:

ID	Distance (m)	Direction	Update
93	28.0	NW	26-Feb-2014
94	31.0	NW	26-Feb-2014
95	50.0	SW	26-Feb-2014
96	64.0	N	26-Feb-2014
97	72.0	N	26-Feb-2014

6.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

6.5 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? Yes

6.6 Groundwater Flooding Susceptibility Areas

6.6.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site?

Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

6.6.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

6.7 Groundwater Flooding Confidence Areas

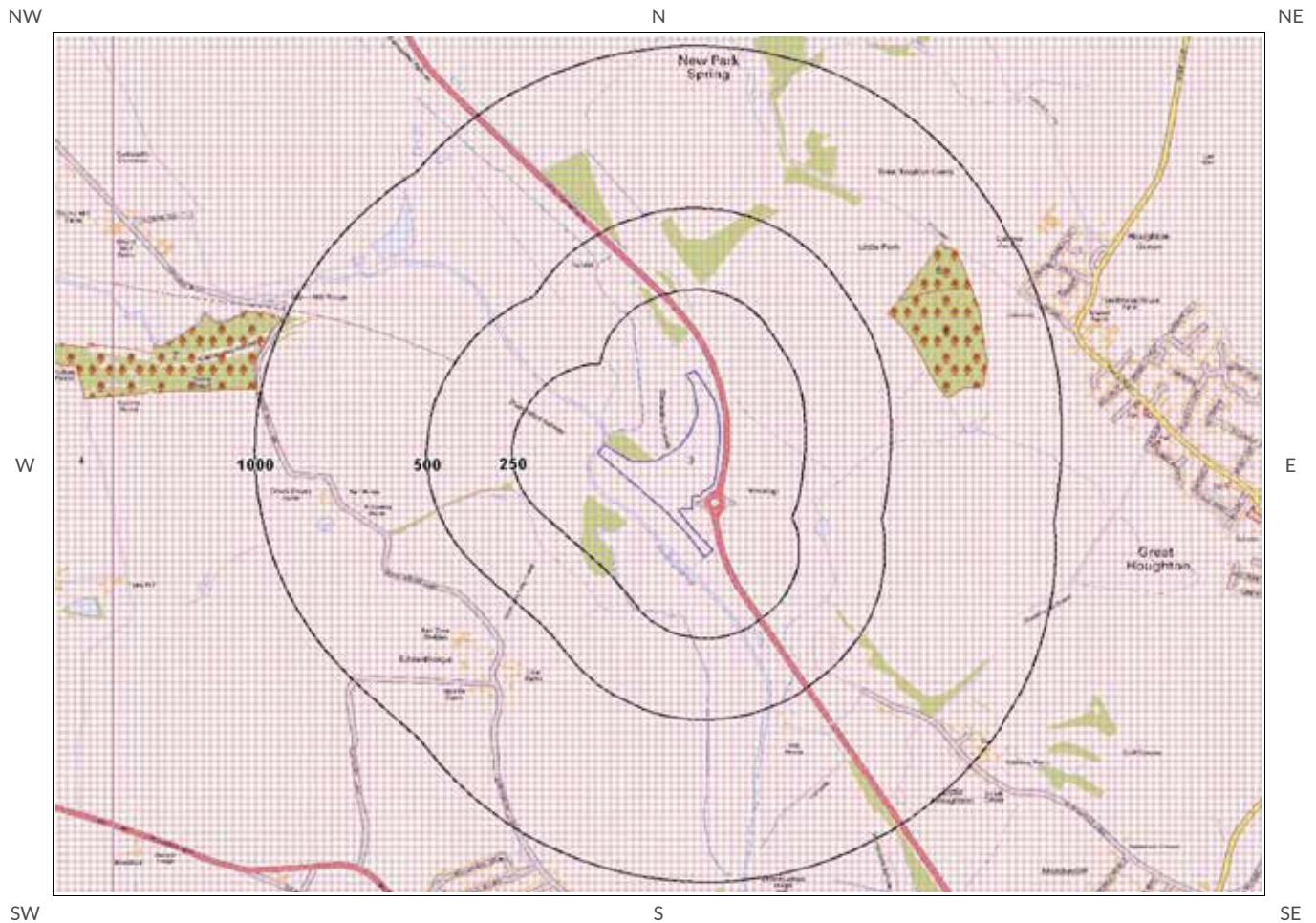
What is the British Geological Survey confidence rating in this result?

Moderate

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

7. Designated Environmentally Sensitive Sites Map



Map Legend



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Site Outline	SAC	SSSI	NNR	World Heritage Sites
Areas of Outstanding Natural Beauty	SPA	Ramsar	LNR	Environmentally Sensitive Areas
	Nitrate Vulnerable Zones	Nitrate Sensitive Areas	National Parks	Ancient Woodlands



7. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site? Yes

7.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site: 1

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
Not shown	1209.0	N	Carlton Main Brickworks	Natural England

7.2 Records of National Nature Reserves (NNR) within 2000m of the study site: 0

Database searched and no data found.

7.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site: 0

Database searched and no data found.

7.4 Records of Special Protection Areas (SPA) within 2000m of the study site: 0

Database searched and no data found.

7.5 Records of Ramsar sites within 2000m of the study site: 0

Database searched and no data found.

7.6 Records of Ancient Woodland within 2000m of the study site:

6

The following Ancient Woodland records are supplied by English Nature/Scottish Natural Heritage/Countryside Council for Wales and are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
5	570.0	NE	LITTLE PARK	Ancient and Semi-Natural Woodland
6	617.0	NE	LITTLE PARK	Ancient Replanted Woodland
7	1006.0	NW	STORRS WOOD	Ancient and Semi-Natural Woodland
Not shown	1550.0	N	WEST HAIGH WOOD	Ancient and Semi-Natural Woodland
Not shown	1606.0	N	WEST HAIGH WOOD	Ancient Replanted Woodland
Not shown	1913.0	W	UNKNOWN	Ancient and Semi-Natural Woodland

7.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

1

The following Local Nature Reserve (LNR) records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
Not shown	1552.0	N	West haigh Wood	Natural England

7.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

7.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

7.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

7.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

7.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

7.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

2

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
3	0.0	On Site	NVZ Area	DEFRA
4	1413.0	W	NVZ Area	DEFRA



8. Natural Hazards Findings

8.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **GroundSure GeolInsight**, available from our [website](#). The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property no significant increase in insurance risk due to natural slope instability problems.

* This indicates an automatically generated 50m buffer and site.

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Null - Negligible

Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

8.1.6 Running Sand

What is the maximum Running Sand** hazard rating identified on the study site?

Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.

* This indicates an automatically generated 50m buffer and site.



9. Mining

9.1 Coal Mining

Are there any coal mining areas within 75m of the study site? Yes

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*? Low-Moderate

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No

Guidance: No Guidance Required.

Contact Details

EmapSite
Telephone: 0118 9736883
sales@emapsite.com



British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries



Environment Agency

National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 08708 506 506
Web: www.environment-agency.gov.uk
Email: enquiries@environment-agency.gov.uk



Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
<https://www.gov.uk/government/organisations/public-health-england>
Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000



The Coal Authority

200 Lichfield Lane
Mansfield
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Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk



Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505



Local Authority

Authority: Barnsley Metropolitan Borough Council
Phone: 01226 770770
Web: www.barnsley.gov.uk/index.asp
Address: Town Hall, Barnsley, South Yorkshire, S70 2TA

Gemapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444



Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, English Nature who retain the Copyright and Intellectual Property Rights for the data. PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028].
This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

In these terms and conditions unless the context otherwise requires:

“Beneficiary” means the person or entity for whose benefit the Client has obtained the Services.

“Client” means the party or parties entering into a Contract with GroundSure.

“Commercial” means any building or property which is not Residential.

“Confidential Information” means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

“Support Services” means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

“Contract” means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

“Third Party Data Provider” means any third party providing Third Party Content to GroundSure.

“Data Reports” means reports comprising factual data with no accompanying interpretation.

“Fees” has the meaning set out in clause 5.1.

“GroundSure” means GroundSure Limited, a company registered in England and Wales under number 03421028.

“GroundSure Materials” means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

“Intellectual Property” means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

“Mapping” means a map, map data or a combination of historical maps of various ages, time periods and scales.

“Order” means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.

“Ordnance Survey” means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 OAS, UK.

“Order Website” means the online platform through which Orders may be placed by the Client and accepted by GroundSure.

“Report” means a Risk Screening Report or Data Report for Commercial or Residential property.

“Residential” means any building or property used as or intended to be used as a single dwelling.

“Risk Screening Report” means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.

“Services” means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.

“Site” means the area of land in respect of which the Client has requested GroundSure to provide the Services.

“Third Party Content” means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.

“User Guide” means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.GroundSure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 GroundSure agrees to provide the Services in accordance with the Contract.

2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions

implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1 The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1 GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together “Fees”).

5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.

6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7. Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death

or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

8 GroundSure's right to suspend or terminate

8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to GroundSure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event

(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in

GroundSure's possession or control; and

(ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English

law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law. © GroundSure Limited June 2013



EmapSite

Masdar House,
Eversley, RG27 0RP

Report Reference: EMS-245265_329171

Your Reference: EMS_245265_329171

Report Date 8 Apr 2014

Report Delivery Method: Email - pdf

GroundSure Geoinsight

Address: ,

Dear Sir/ Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure Geolnsight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
GroundSure Geolnsight



GroundSure GeoInsight

Address: ,
Date: 8 Apr 2014
Reference: EMS-245265_329171
Client: EmapSite

NW N NE

W E



SW S SE

Aerial Photograph Capture date: 26-Mar-2012
Grid Reference: 441652,406467
Site Size: 5.85ha

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Overview of Findings

The GroundSure GeoInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology

1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	Yes
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	Yes
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

Section 2: Ground Workings

	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	10	3	15	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	1	1	2	2	7
2.3 Current Ground Workings	0	0	2	1	3

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	1	1	2	0	7
3.2 Coal Mining	1	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	1	0	2	1	2
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

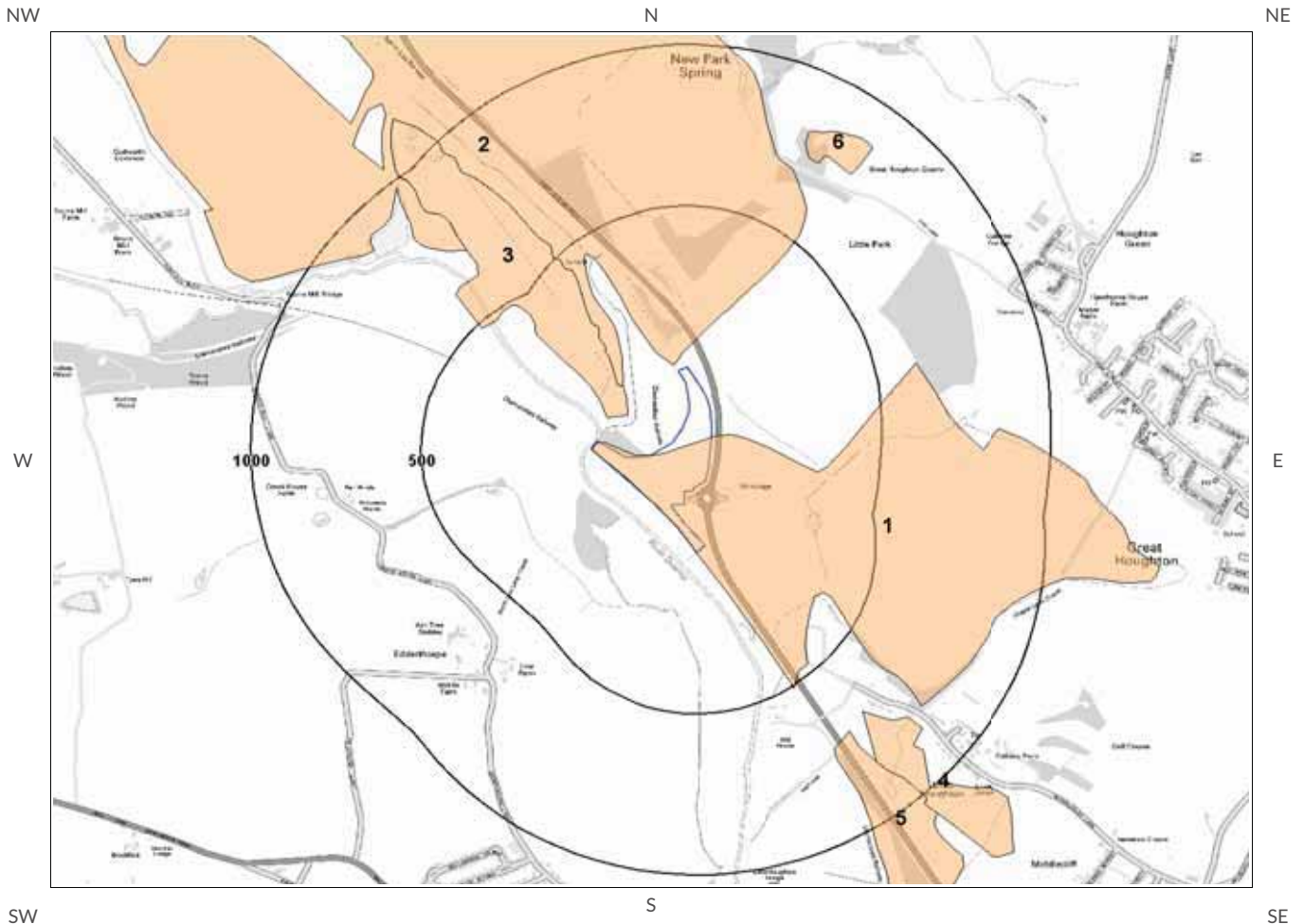
Section 4: Natural Ground Subsidence	On-site
4.1 Shrink Swell Clay	Low
4.2 Landslides	Low
4.3 Ground Dissolution of Soluble Rocks	Null
4.4 Compressible Deposits	Moderate
4.5 Collapsible Deposits	Very Low
4.6 Running Sand	Low

Section 5: Borehole Records	On-site	0-50m	51-250
5 BGS Recorded Boreholes	3	3	13

Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250
6 Records of Background Soil Chemistry	5	0	12

1 Geology




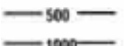




1.1 Artificial Ground Map

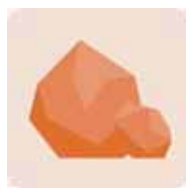


Artificial Ground Legend



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	Site Outline		Made Ground (undivided)		Disturbed Ground (undivided)
	Search Buffers (m)		Worked Ground (undivided)		Landscaped Ground (undivided)
			Infilled Ground		Reclaimed Ground



1 Geology

1.1 Artificial Ground

1.1.1 Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:087

Are there any records of Artificial/Made Ground within 500m of the study site boundary? Yes

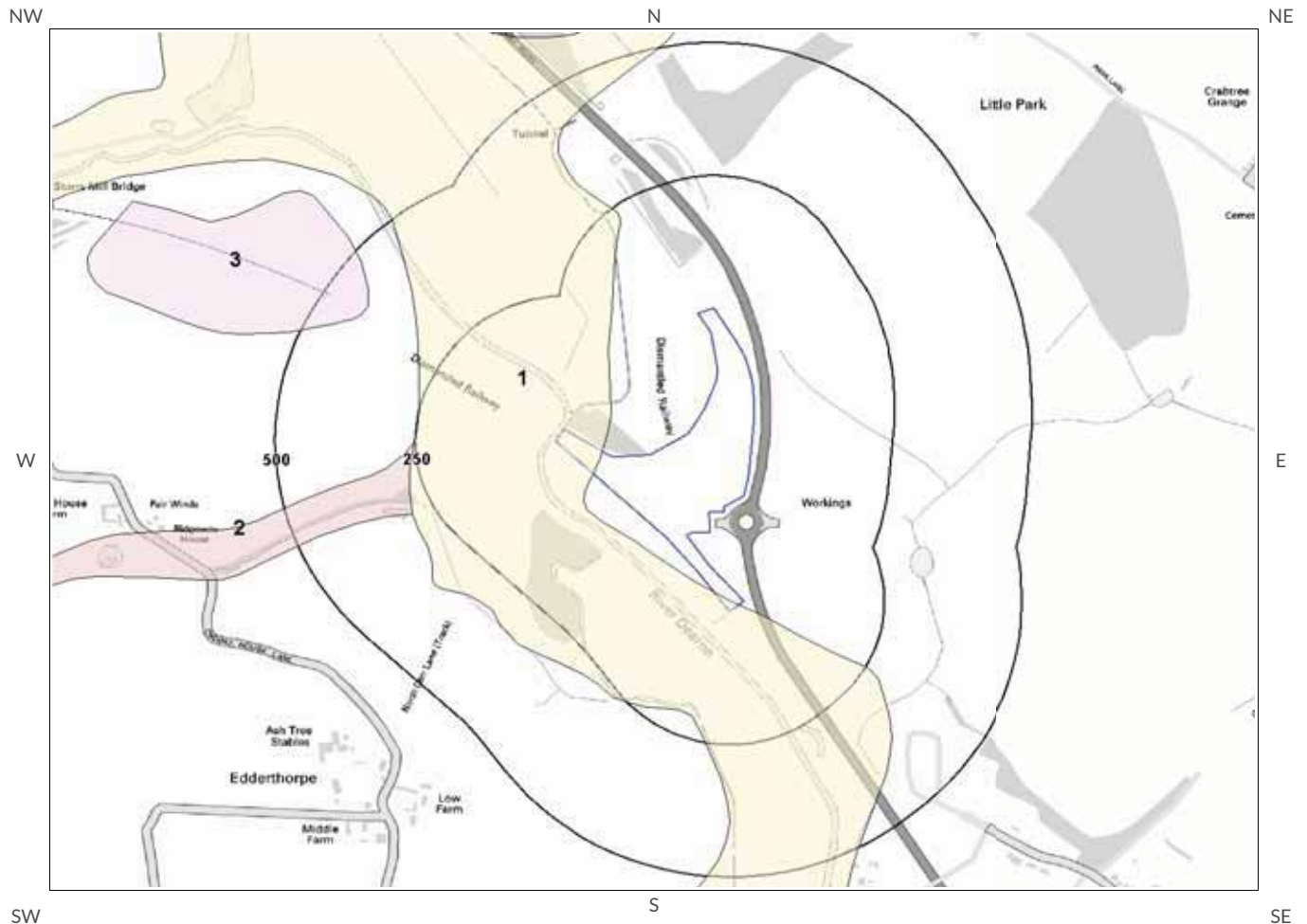
ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	21.0	NW	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	78.0	NE	WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT

1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	Very Low
21.0	NW	Intergranular	Very High	Very Low

1.2 Superficial Deposits and Landslips Map



Superficial Deposits and Landslips Legend



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-  Site Outline
-  Search Buffers (m)

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	ALV-CLSI	ALLUVIUM	CLAY AND SILT
2	252.0	W	HEAD-DMTN	HEAD	DIAMICTON
3	420.0	NW	GFDMP-SAGR	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Low	Very Low

1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

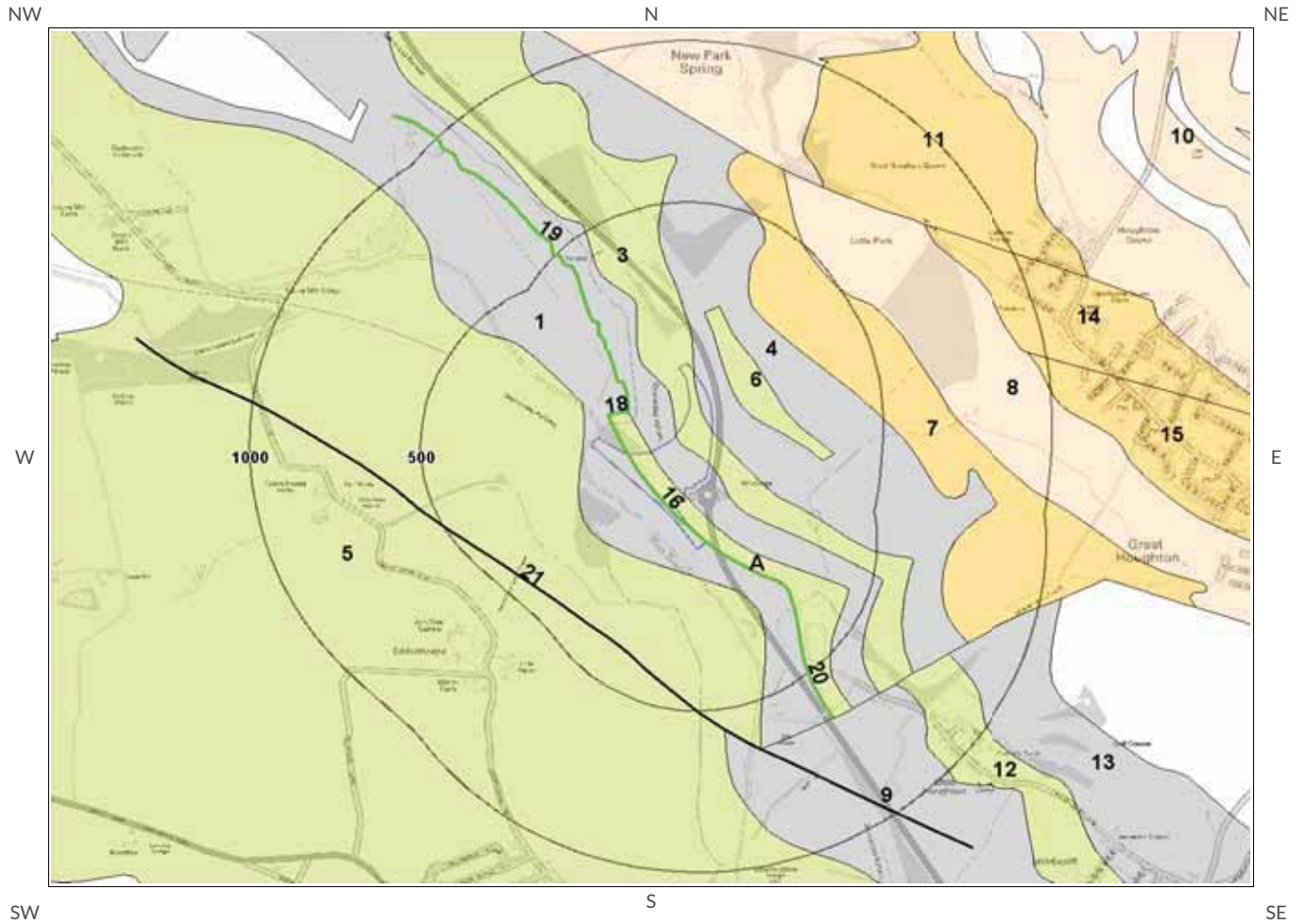
1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site** boundary? No

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site


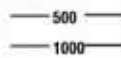
1.3 Bedrock and Faults Map



Bedrock and Faults Legend



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-  Site Outline
-  Search Buffers (m)

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:087

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/ Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsoviaian (westphalian C) / Duckmantian (westphalian B)
2A	0.0	On Site	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsoviaian (westphalian C) / Duckmantian (westphalian B)
3	0.0	On Site	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsoviaian (westphalian C) / Duckmantian (westphalian B)
4	0.0	On Site	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsoviaian (westphalian C) / Duckmantian (westphalian B)
5	26.0	W	MXR-SDST	Mexborough Rock - Sandstone	Bolsoviaian (westphalian C)
6	71.0	E	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsoviaian (westphalian C) / Duckmantian (westphalian B)
7	258.0	NE	AR-SDST	Ackworth Rock - Sandstone	Bolsoviaian (westphalian C)
8	486.0	NE	PUCM-MDSS	Pennine Upper Coal Measures Formation - Mudstone, Siltstone And Sandstone	Westphalian D / Bolsoviaian (westphalian C)

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site^{*} boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	High	Moderate
0.0	On Site	Fracture	Moderate	Low
0.0	On Site	Fracture	High	Moderate
0.0	On Site	Fracture	Moderate	Low
26.0	W	Fracture	High	Moderate

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	Category Description	Feature Description
16	0.0	On Site	ROCK	Coal seam, inferred
17A	47.0	SE	ROCK	Coal seam, inferred
18	78.0	NE	ROCK	Coal seam, inferred
19	115.0	NE	ROCK	Coal seam, inferred
20	336.0	SE	ROCK	Coal seam, inferred

* This includes an automatically generated 50m buffer zone around the site

ID	Distance (m)	Direction	Category Description	Feature Description
21	377.0	SW	FAULT	Normal fault, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.



1.4 Radon Data

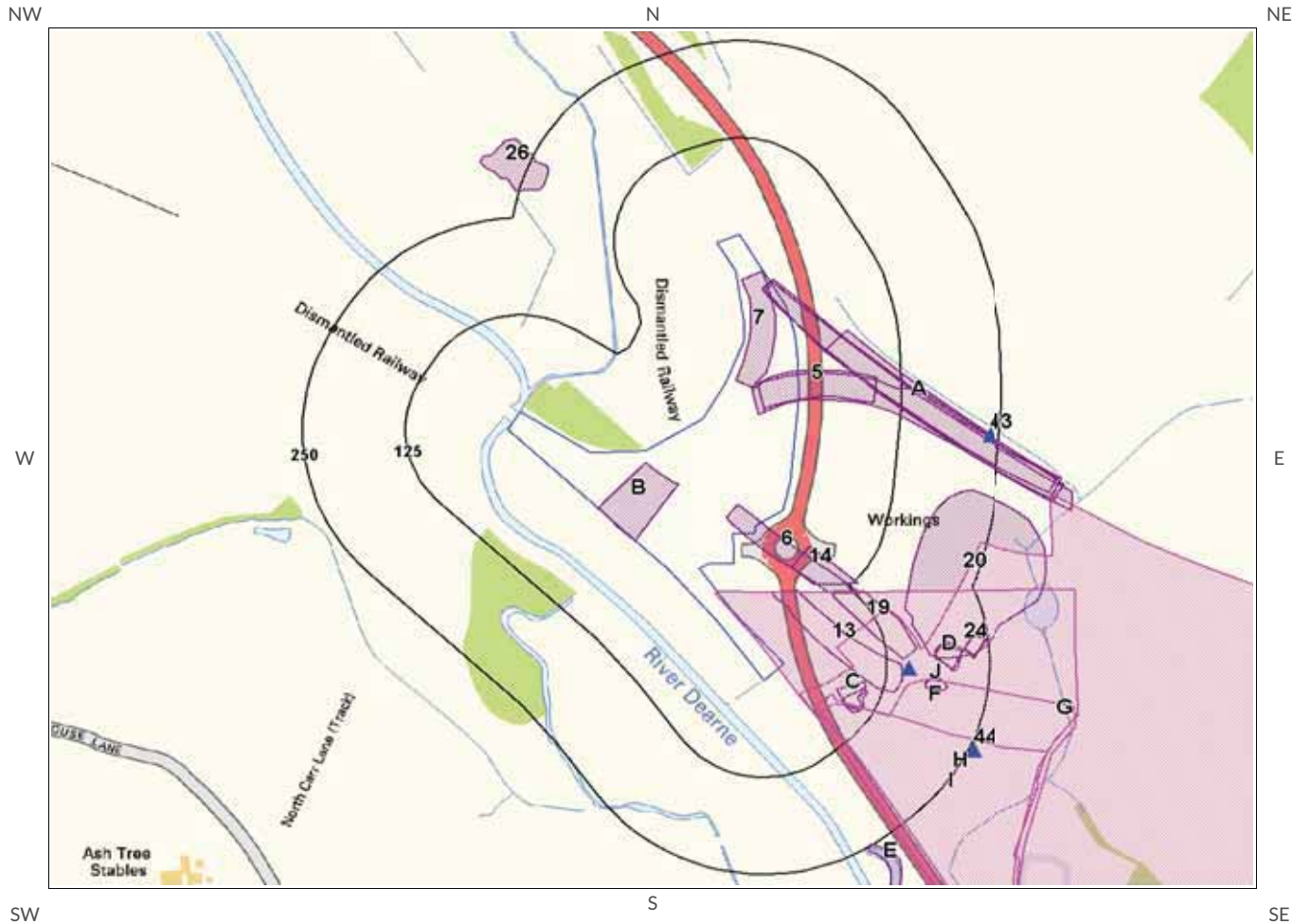
1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level

1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary


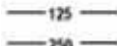



2 Ground Workings Map



Ground Workings Legend



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-  Site Outline
-  Search Buffers (m)
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings



2 Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1F	0.0	On Site	441891 406018	Colliery	1948
2A	0.0	On Site	441914 406550	Cuttings	1948
3A	0.0	On Site	441914 406550	Cuttings	1904
4A	0.0	On Site	441968 406499	Cuttings	1981
5	0.0	On Site	441789 406559	Cuttings	1988
6	0.0	On Site	441760 406354	Cuttings	1904
7	0.0	On Site	441714 406637	Cuttings	1988
8B	0.0	On Site	441571 406414	Cuttings	1904
9B	0.0	On Site	441571 406414	Cuttings	1948
10A	0.0	On Site	441879 406563	Cuttings	1951
11A	35.0	E	441945 406527	Cuttings	1967
12G	42.0	SE	442198 406079	Colliery	1951
13	49.0	NE	441814 406235	Cuttings	1904
14	55.0	SE	441799 406333	Cuttings	1948
15H	65.0	SE	441947 405970	Colliery	1904
16C	72.0	SE	441830 406165	Unspecified Ground Workings	1951
17I	76.0	SE	441955 405941	Colliery	1890
18C	84.0	SE	441836 406159	Unspecified Pit	1948
19	103.0	NE	441859 406256	Cuttings	1904
20	163.0	NE	441983 406321	Refuse Heap	1967
21J	173.0	E	441934 406178	Unspecified Pit	1904

ID	Distance (m)	Direction	NGR	Use	Date
22D	184.0	E	441949 406214	Unspecified Pit	1948
23D	184.0	E	441950 406216	Unspecified Pit	1951
24	220.0	E	441981 406230	Cuttings	1951
25D	221.0	E	441982 406228	Cuttings	1948
26	223.0	W	441420 406848	Pond	1988
27E	248.0	SE	441884 405945	Pond	1988
28E	248.0	SE	441884 405945	Pond	1981

2.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
29F	0.0	On Site	441891 406018	Colliery	1948
30G	42.0	SE	442198 406079	Colliery	1951
31H	65.0	SE	441947 405970	Colliery	1904
32I	76.0	SE	441955 405941	Colliery	1890
Not shown	421.0	NW	441432 407103	Tunnel	1988
Not shown	421.0	NW	441432 407103	Tunnel	1981
Not shown	642.0	SE	442253 405445	Colliery	1951
Not shown	645.0	SE	442266 405442	Colliery	1938
Not shown	646.0	SE	442266 405496	Colliery	1904
Not shown	649.0	SE	442310 405405	Unspecified Mine	1967
Not shown	649.0	SE	442310 405405	Colliery	1981
Not shown	649.0	SE	442310 405405	Colliery	1988
Not shown	739.0	NW	440859 408124	Colliery	1948

2.3 Current Ground Workings

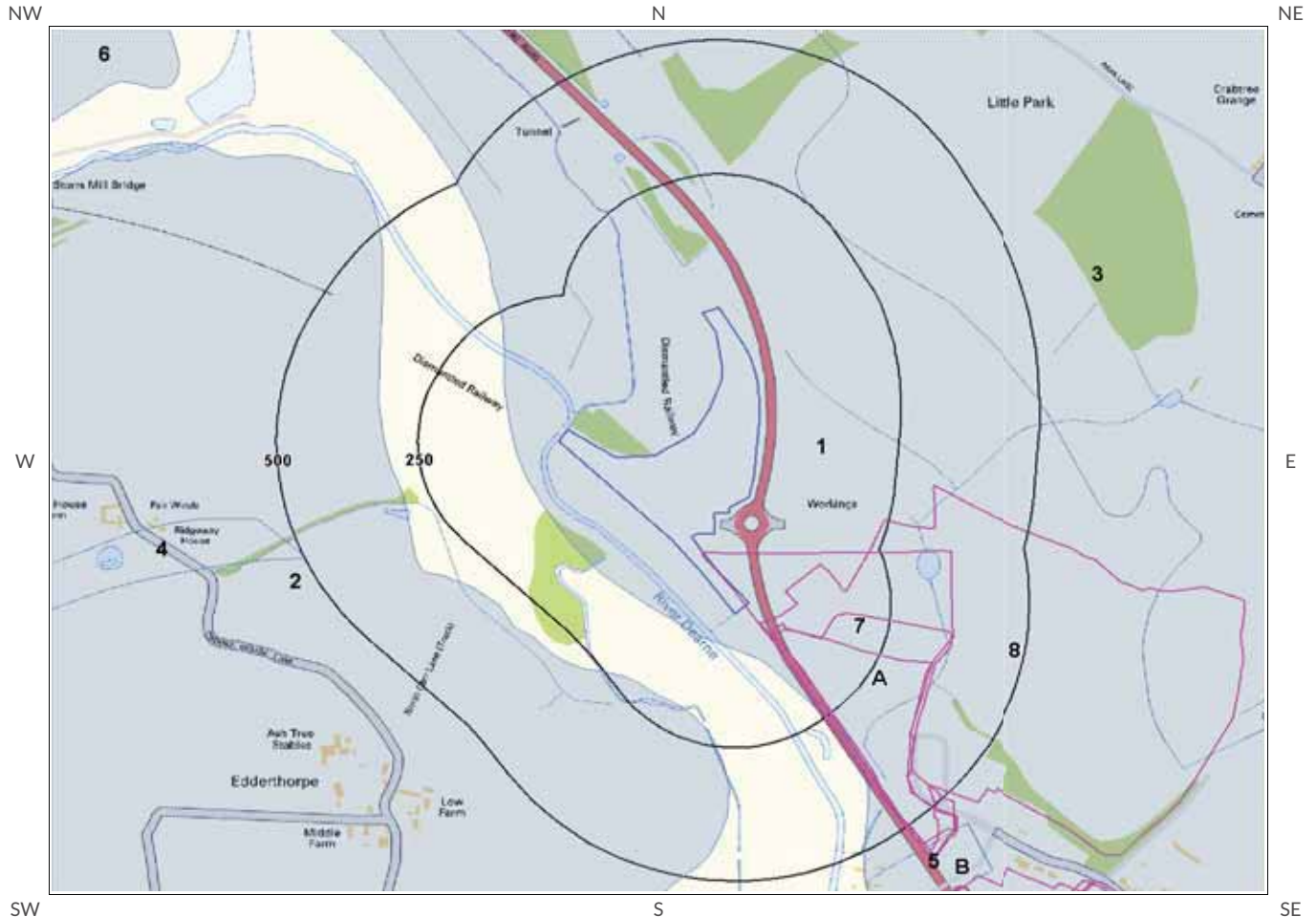
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
42J	151.0	E	441900 406200	Coal, Surface Mined	Houghton Main Extension OCCS	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
43	237.0	E	442000 406500	Coal, Surface Mined	Houghton Main OCCS	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
44	256.0	SE	441980 406095	Coal, Deep	Houghton Main Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	785.0	NE	442125 407415	Sandstone	Great Houghton	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	804.0	SE	442210 405545	Coal, Deep	Dearne Valley Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	918.0	SE	442200 405400	Coal, Surface Mined	Firtree Link Road	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

3 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

Mapping sourced from Ordnance Survey

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3 Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from GroundSure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? Yes

The following Historical Mining information is provided by GroundSure:

ID	Distance (m)	Direction	NGR	Details	Date
7	0.0	On Site	441891 406018	Colliery	1948
8	42.0	SE	442198 406079	Colliery	1951
9A	65.0	SE	441947 405970	Colliery	1904
10A	76.0	SE	441955 405941	Colliery	1890
11B	642.0	SE	442253 405445	Colliery	1951
12B	645.0	SE	442266 405442	Colliery	1938
13	646.0	SE	442266 405496	Colliery	1904
14B	649.0	SE	442310 405405	Colliery	1981
15B	649.0	SE	442310 405405	Colliery	1988
16B	649.0	SE	442310 405405	Unspecified Mine	1967
Not shown	739.0	NW	440859 408124	Colliery	1948

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

3.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Iron Ore (Bedded)	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
2	198.0	SW	Sheffield Area	Iron Ore	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
3	247.0	NE	Sheffield Area	Iron Ore	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
4	496.0	SW	Not available	Iron Ore (Bedded)	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
5	546.0	SE	Sheffield Area	Iron Ore	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
6	952.0	NW	Sheffield Area	Iron Ore	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.

3.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.7 Brine Extraction

This dataset provides information from the Brine Compensation Board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.10 Clay Mining

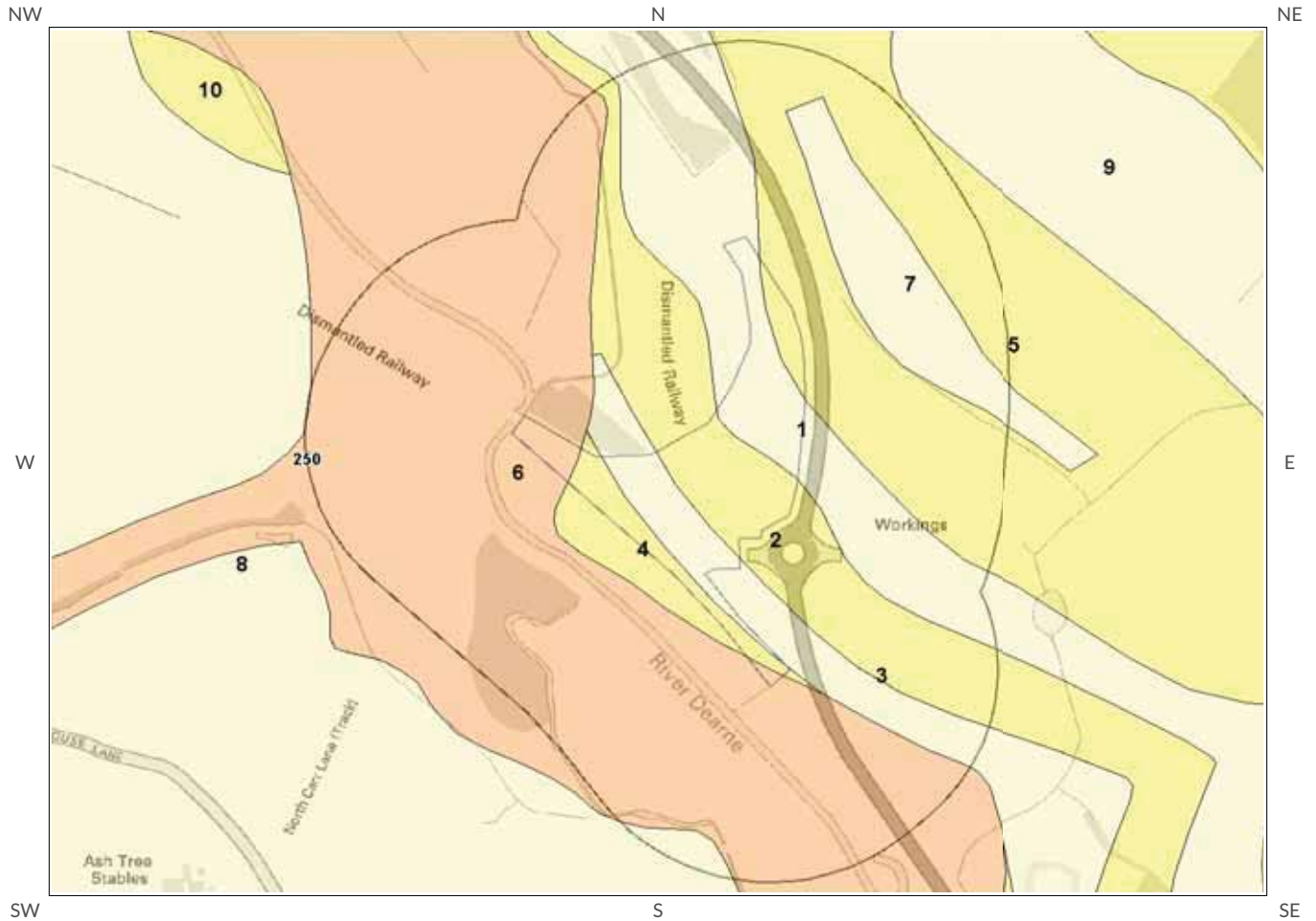
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

4 Natural Ground Subsidence

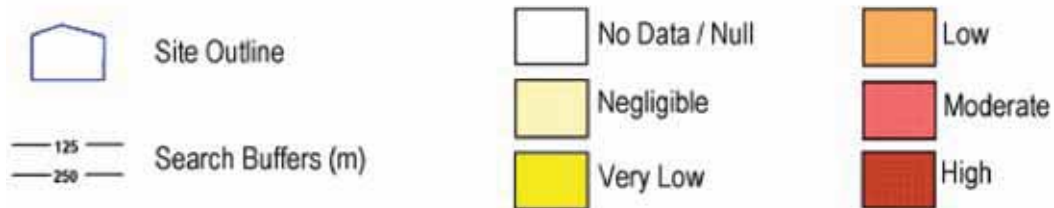
4.1 Shrink-Swell Clay Map



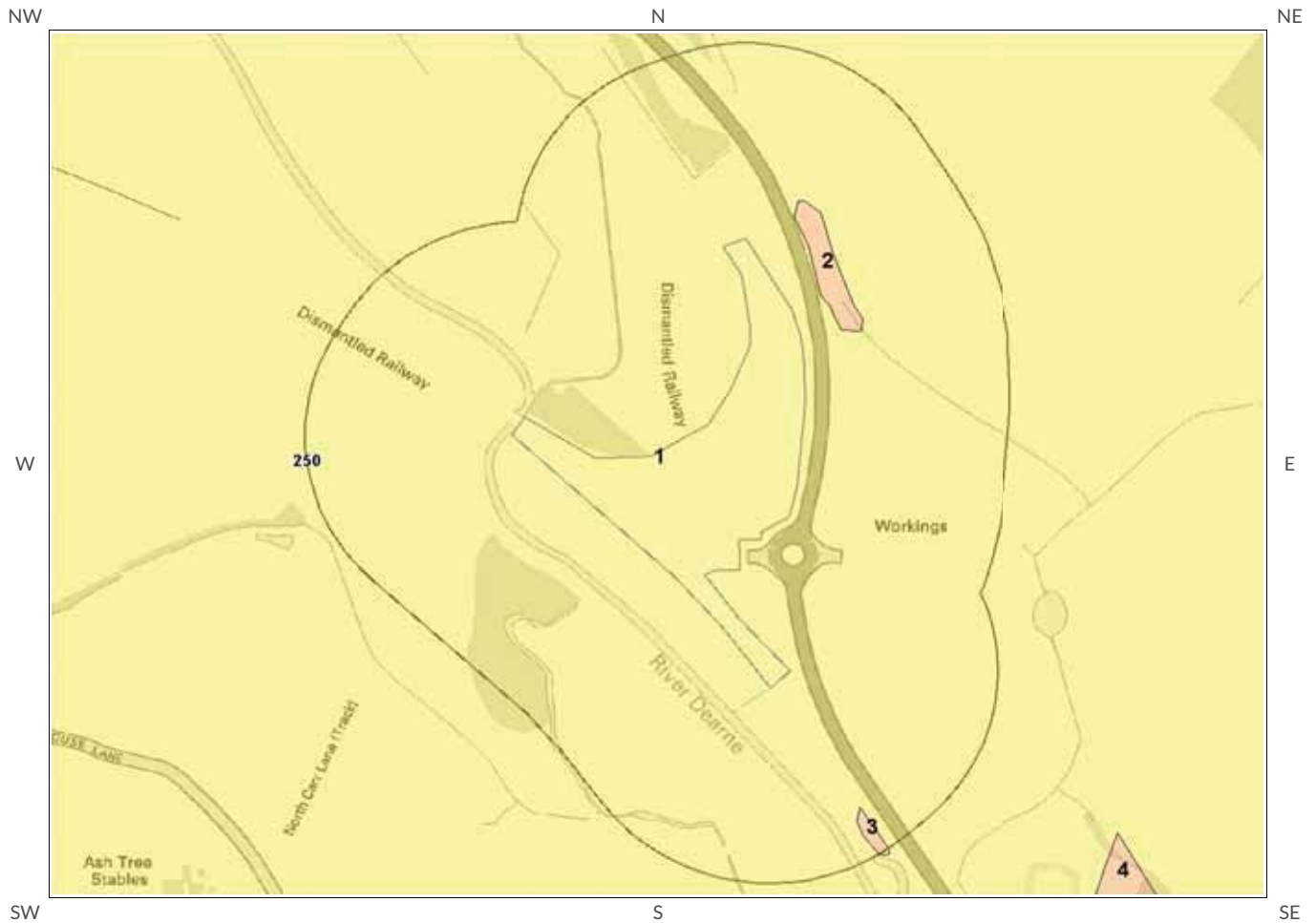
Shrink Swell Clay Legend



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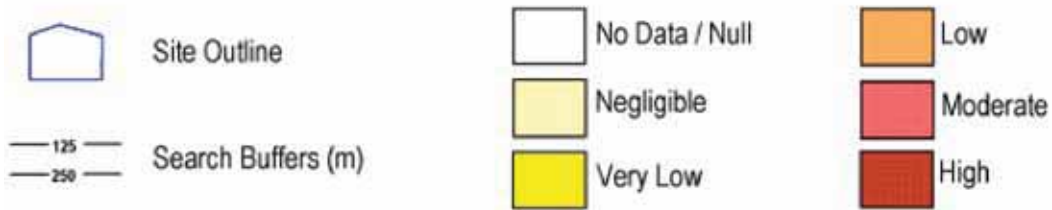
4.2 Landslides Map



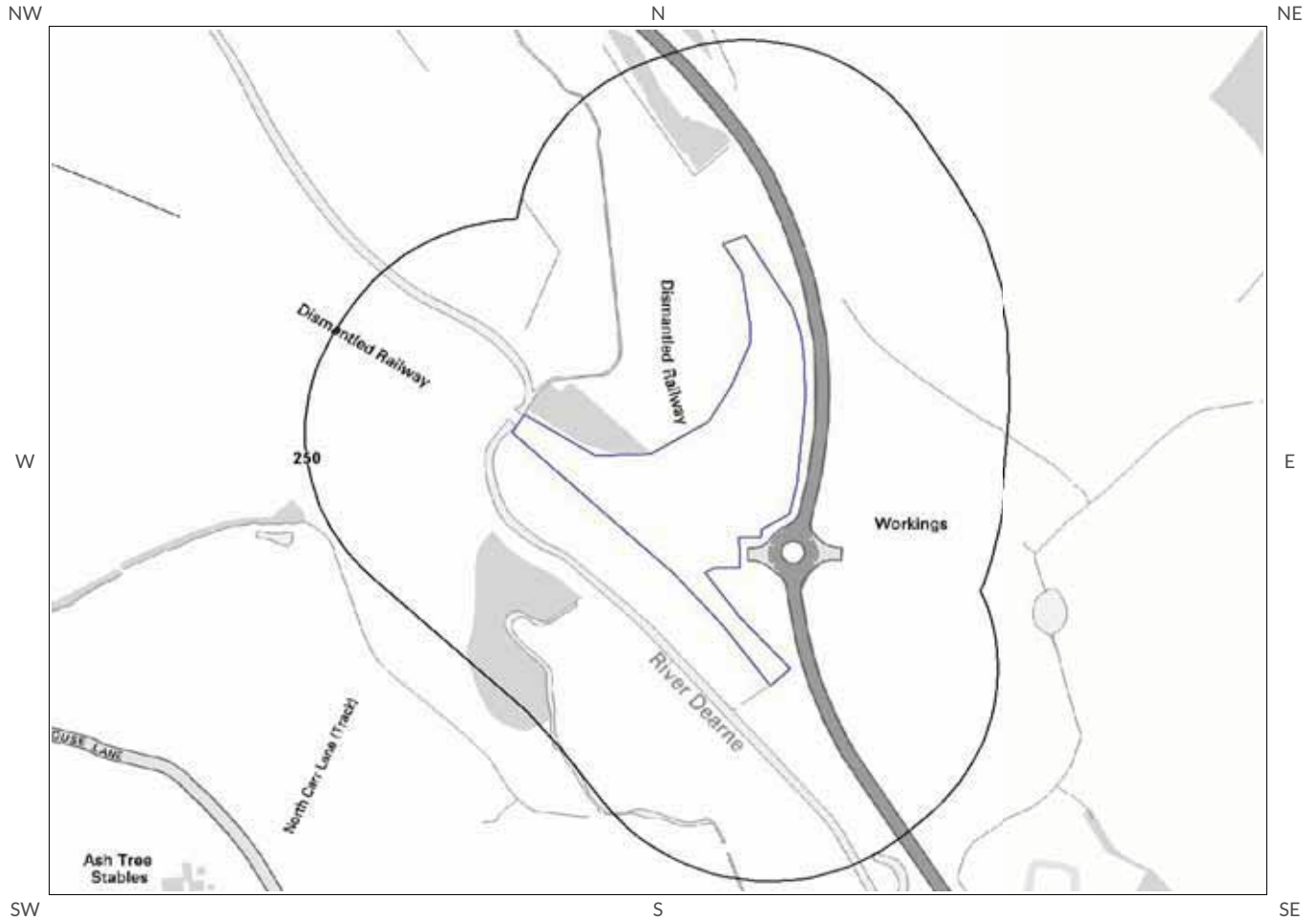
Landslides Legend



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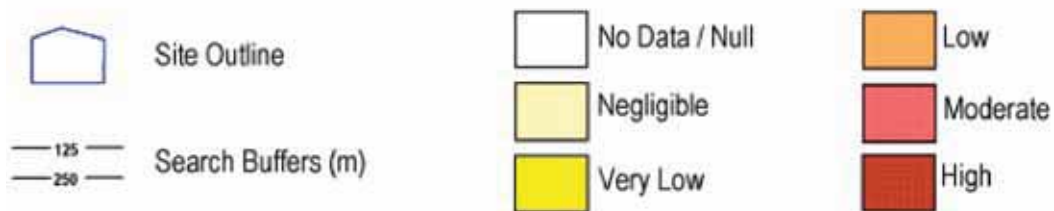
4.3 Ground Dissolution Soluble Rocks Map



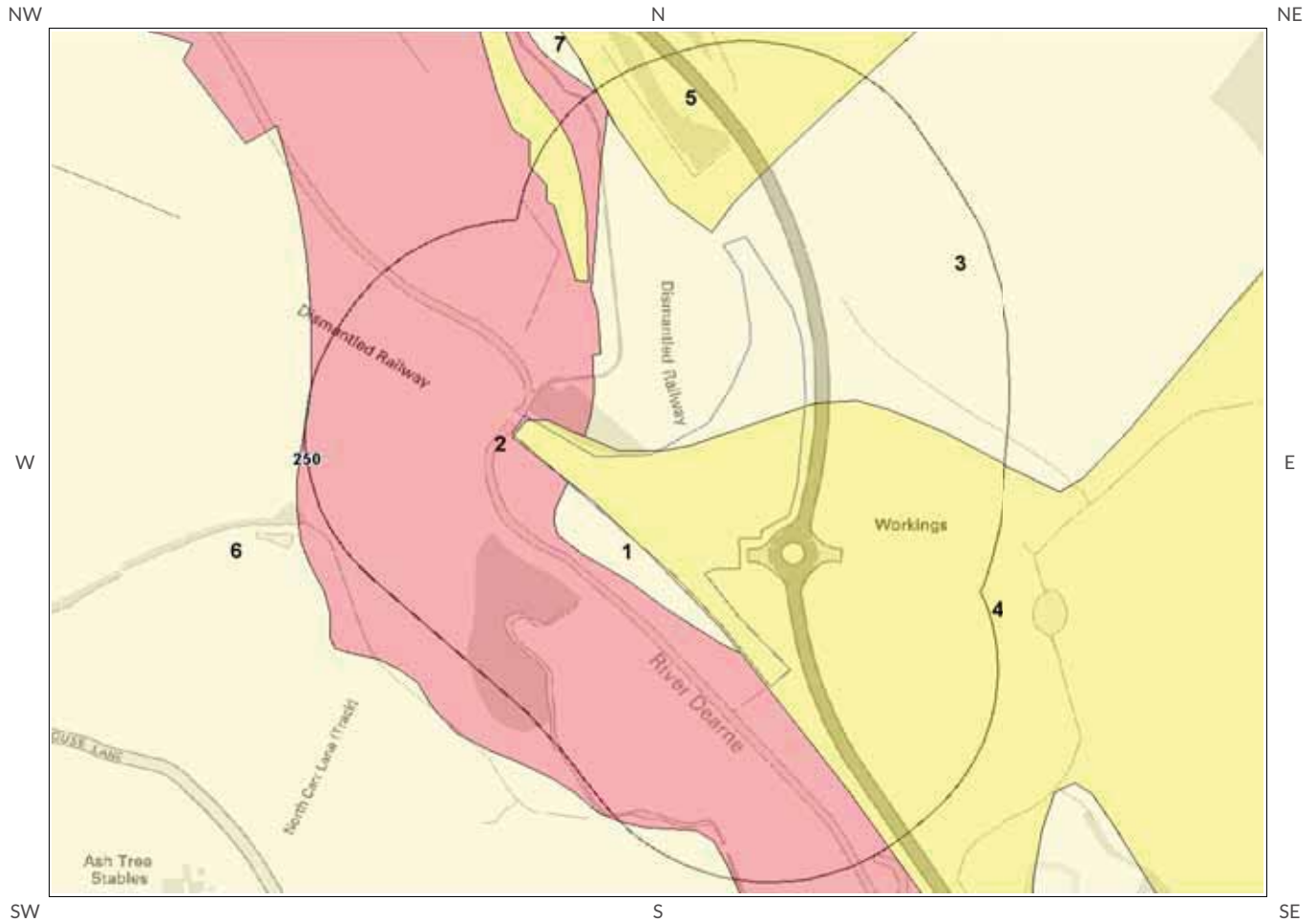
Ground Dissolution Soluble Rocks Legend



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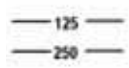




4.4 Compressible Deposits Map



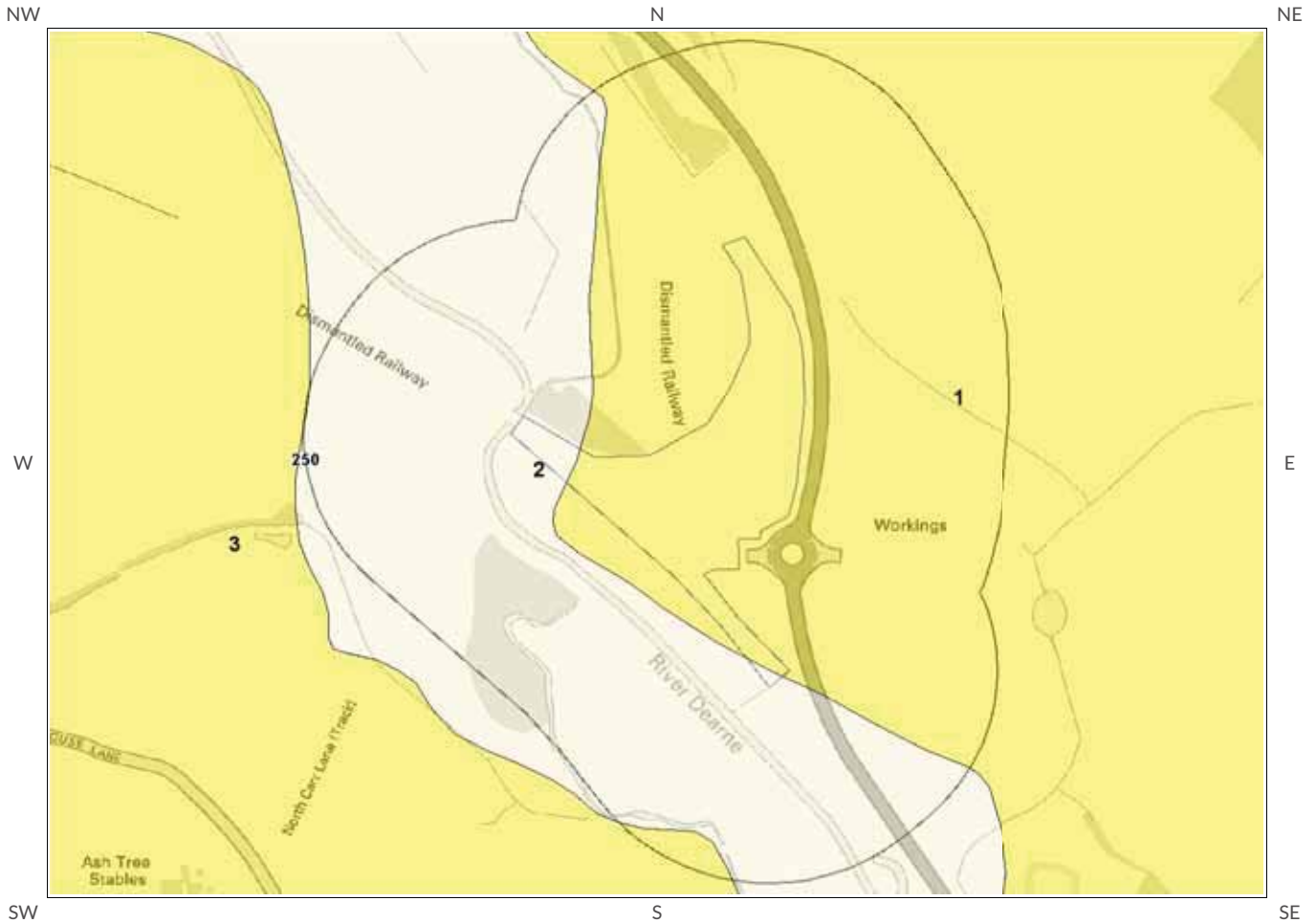
Compressible Deposits Legend



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	Site Outline		No Data / Null		Low
	Search Buffers (m)		Negligible		Moderate
			Very Low		High

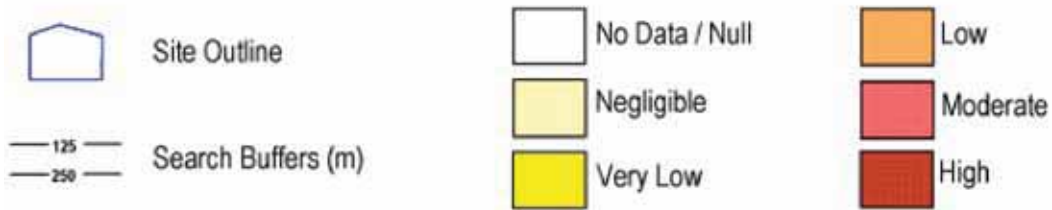
4.5 Collapsible Deposits Map



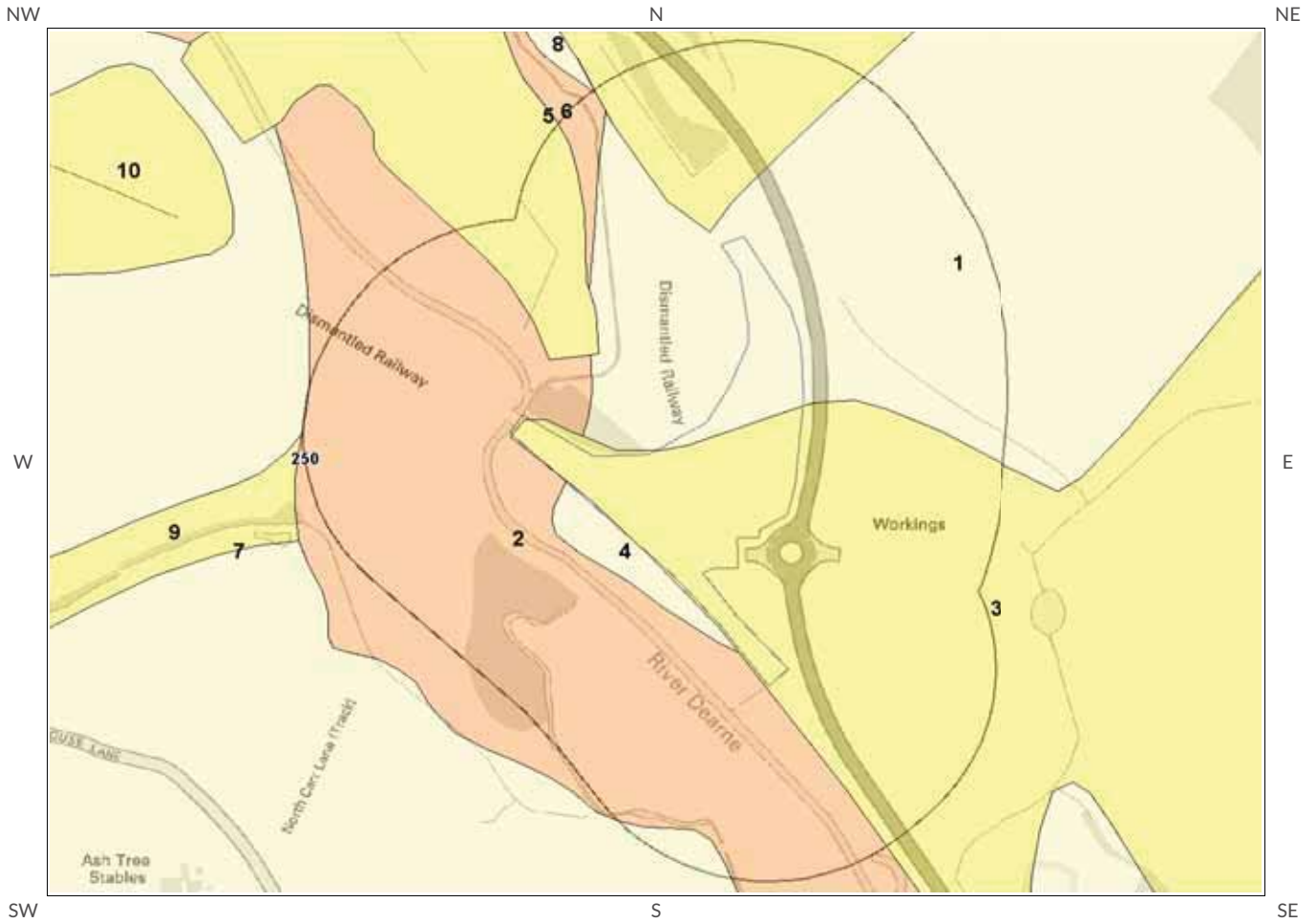
Collapsible Deposits Legend



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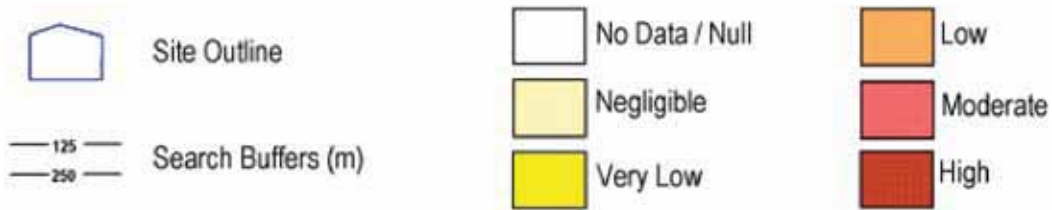
4.6 Running Sand Map



Running Sand Legend



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4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? Moderate

4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
2	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
3	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
4	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
5	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
6	0.0	On Site	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

* This includes an automatically generated 50m buffer zone around the site

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
2	39.0	NE	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

4.3 Ground Dissolution of Soluble Rocks

The following Compressible Deposits information provided by the British Geological Survey:

Distance (m)	Direction	Hazard Rating	Details
0	On site	Null-Negligible	Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
2	0.0	On Site	Moderate	Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property - possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.
3	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
4	0.0	On Site	Very Low	Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

ID	Distance (m)	Direction	Hazard Rating	Details
5	21.0	NW	Very Low	Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build - consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property - no significant increase in insurance risk due to running sand problems is likely.
3	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
4	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

ID	Distance (m)	Direction	Hazard Rating	Details
5	21.0	NW	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.



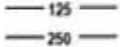
5 Borehole Records Map



Borehole Records Legend



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-  Site Outline
-  Borehole Locations
-  Search Buffers (m)



5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

19

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	0.0	On Site	441687 406246	SE40NW19	37.8	HOUGHTON MAIN COLLIERY 4 U/G
2	0.0	On Site	441763 406543	SE40NW22	32.61	HOUGHTON MAIN COLLIERY 11 U/G
3	0.0	On Site	441750 406658	SE40NW12/C	7.01	GRIMETHORPE
4A	19.0	NE	441688 406304	SE40NW397	-1.0	HOUGHTON MAIN 2
5A	20.0	NE	441691 406301	SE40NW398	-1.0	HOUGHTON MAIN BOREHOLE
6	48.0	E	441795 406194	SE40NW108	12.77	HOUGHTON MAIN COLLIERY NO.6A SURF BH
7	63.0	NW	441620 406790	SE40NW400	31.0	HOUGHTON MAIN COLLIERY BARNSELY
8	75.0	E	441823 406194	SE40NW365	-1.0	HOUGHTON MAIN BARNSELY TP 3
9	89.0	NE	441829 406244	SE40NW106	19.45	HOUGHTON MAIN COLLIERY NO.4A SURF BH
10B	90.0	E	441857 406557	SE40NW12/B	9.14	THREE BHS AT GRIMETHORPE
11B	96.0	E	441863 406558	SE40NW20	31.39	HOUGHTON MAIN COLLIERY 5 U/G
12	98.0	E	441847 406207	SE40NW107	17.08	HOUGHTON MAIN COLLIERY NO.5A SURF BH
13	186.0	NE	441920 406280	SE40NW363	-1.0	HOUGHTON MAIN BARNSELY TP 1
14	193.0	E	441955 406492	SE40NW12/A	8.84	THREE BHS AT GRIMETHORPE
15	200.0	E	441953 406401	SE40NW364	-1.0	HOUGHTON MAIN BARNSELY TP 2
16C	219.0	NE	441805 406947	SE40NW360	-1.0	HOUGHTON MAIN BARNSELY R2
17	222.0	NE	441845 406922	SE40NW367	-1.0	HOUGHTON MAIN BARNSELY TP 5
18	233.0	E	441965 406293	SE40NW105	33.1	HOUGHTON MAIN COLLIERY NO.1A SURF BH
19C	237.0	NE	441826 406955	SE40NW366	-1.0	HOUGHTON MAIN BARNSELY TP 4

Additional online information is available for the following boreholes listed above:

#1: scans.bgs.ac.uk/sobi_scans/boreholes/105480
#2: scans.bgs.ac.uk/sobi_scans/boreholes/105483
#3: scans.bgs.ac.uk/sobi_scans/boreholes/105473
#6: scans.bgs.ac.uk/sobi_scans/boreholes/105590
#7: scans.bgs.ac.uk/sobi_scans/boreholes/18532958
#9: scans.bgs.ac.uk/sobi_scans/boreholes/105588
#10B: scans.bgs.ac.uk/sobi_scans/boreholes/105472
#11B: scans.bgs.ac.uk/sobi_scans/boreholes/105481
#12: scans.bgs.ac.uk/sobi_scans/boreholes/105589
#14: scans.bgs.ac.uk/sobi_scans/boreholes/105471
#18: scans.bgs.ac.uk/sobi_scans/boreholes/105587



6 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

17

For further information on how this data is calculated and limitations upon its use, please see the GroundSure Geolnsight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
0.0	On Site	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
0.0	On Site	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
62.0	S	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
107.0	NE	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
185.0	S	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
198.0	SW	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
201.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
202.0	SW	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
233.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
235.0	E	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
239.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
242.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
245.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg
247.0	NE	RuralSoil	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<150 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

Contact Details



EmapSite
Telephone: 0118 9736883
sales@emapsite.com



British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries



British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX



The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk



Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
<https://www.gov.uk/government/organisations/public-health-england>
Email: enquiries@phe.gov.uk
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Report Reference: EMS-245265_329171

Client Reference: EMS_245265_329171

Standard Terms and Conditions

1 Definitions

In these terms and conditions unless the context otherwise requires:

"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.

"Client" means the party or parties entering into a Contract with GroundSure.

"Commercial" means any building or property which is not Residential.

"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

"Support Services" means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

"Third Party Data Provider" means any third party providing Third Party Content to GroundSure.

"Data Reports" means reports comprising factual data with no accompanying interpretation.

"Fees" has the meaning set out in clause 5.1.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028.

"GroundSure Materials" means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.

"Order" means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.

"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

"Order Website" means the online platform through which Orders may be placed by the Client and accepted by GroundSure.

"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.

"Residential" means any building or property used as or intended to be used as a single dwelling.

"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.

"Services" means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.

"Site" means the area of land in respect of which the Client has requested GroundSure to provide the Services.

"Third Party Content" means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.GroundSure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 GroundSure agrees to provide the Services in accordance with the Contract.

2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order

shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1 The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1 GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.

6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7. Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

8 GroundSure's right to suspend or terminate

8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to GroundSure within 30

days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event

(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in GroundSure's possession or control; and

(ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

(i) the Client or Beneficiary's failure to provide facilities, access or information;

(ii) fire, storm, flood, tempest or epidemic;

(iii) Acts of God or the public enemy;

(iv) riot, civil commotion or war;

(v) strikes, labour disputes or industrial action;

(vi) acts or regulations of any governmental or other agency;

(vii) suspension or delay of services at public registries by Third

Party Data Providers;

(viii) changes in law; or

(ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly

given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law

Site Details:

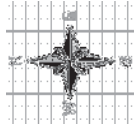
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 2012

Scale: 1:10,000

Printed at: 1:10,000



2012



Produced by
GroundSure Environmental Insight
www.groundsure.com

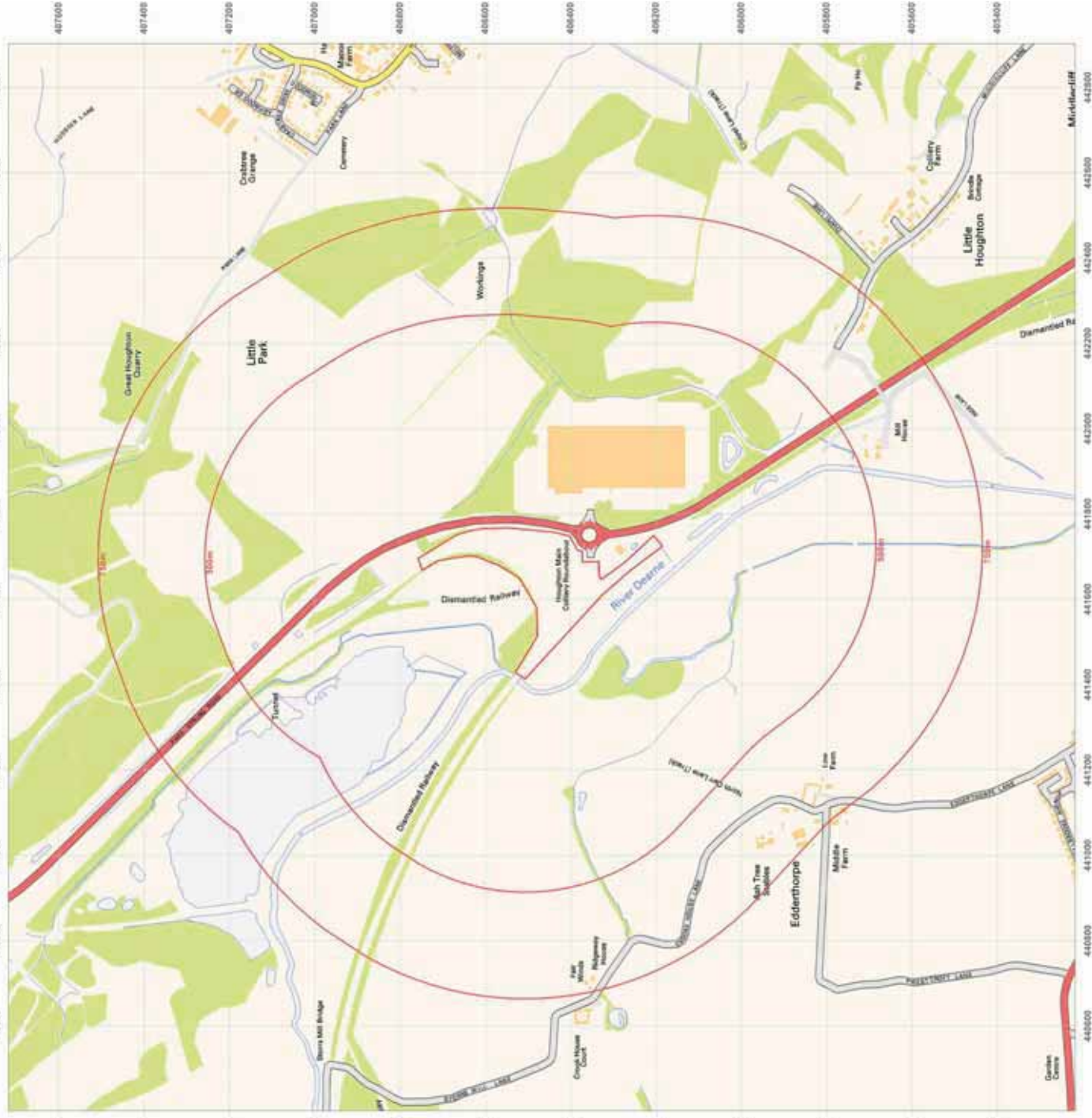


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www.emapsite.com
sales@emapsite.com

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Production date: 08 April 2014

To view map legend click here [Legend](#)



Site Details:

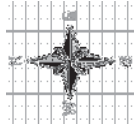
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



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GroundSure
GroundSure Environmental Insight
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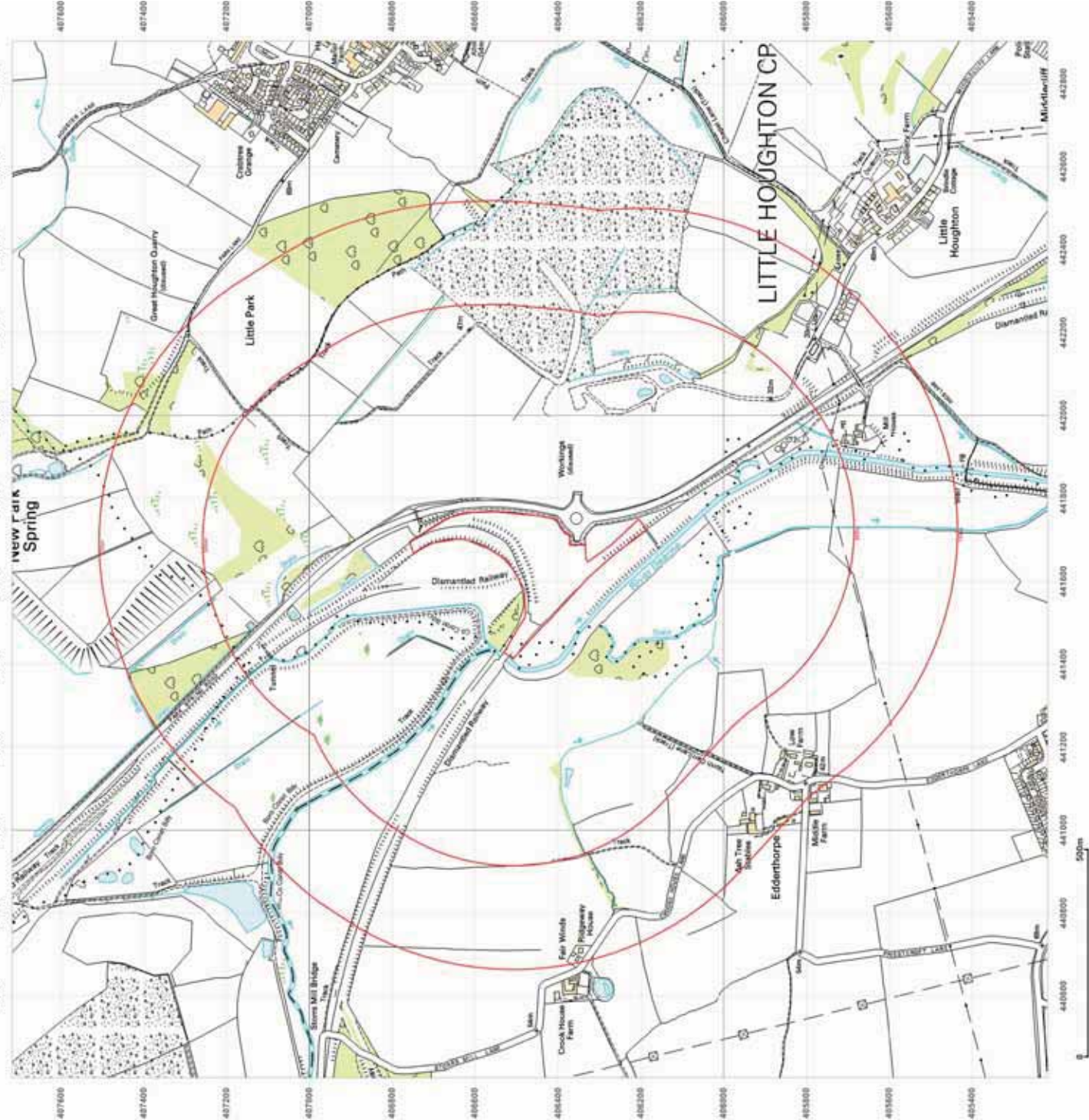


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Site Details:

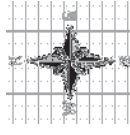
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1988

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1987
Revised 1988
Edition N/A
Copyright N/A
Levelled N/A



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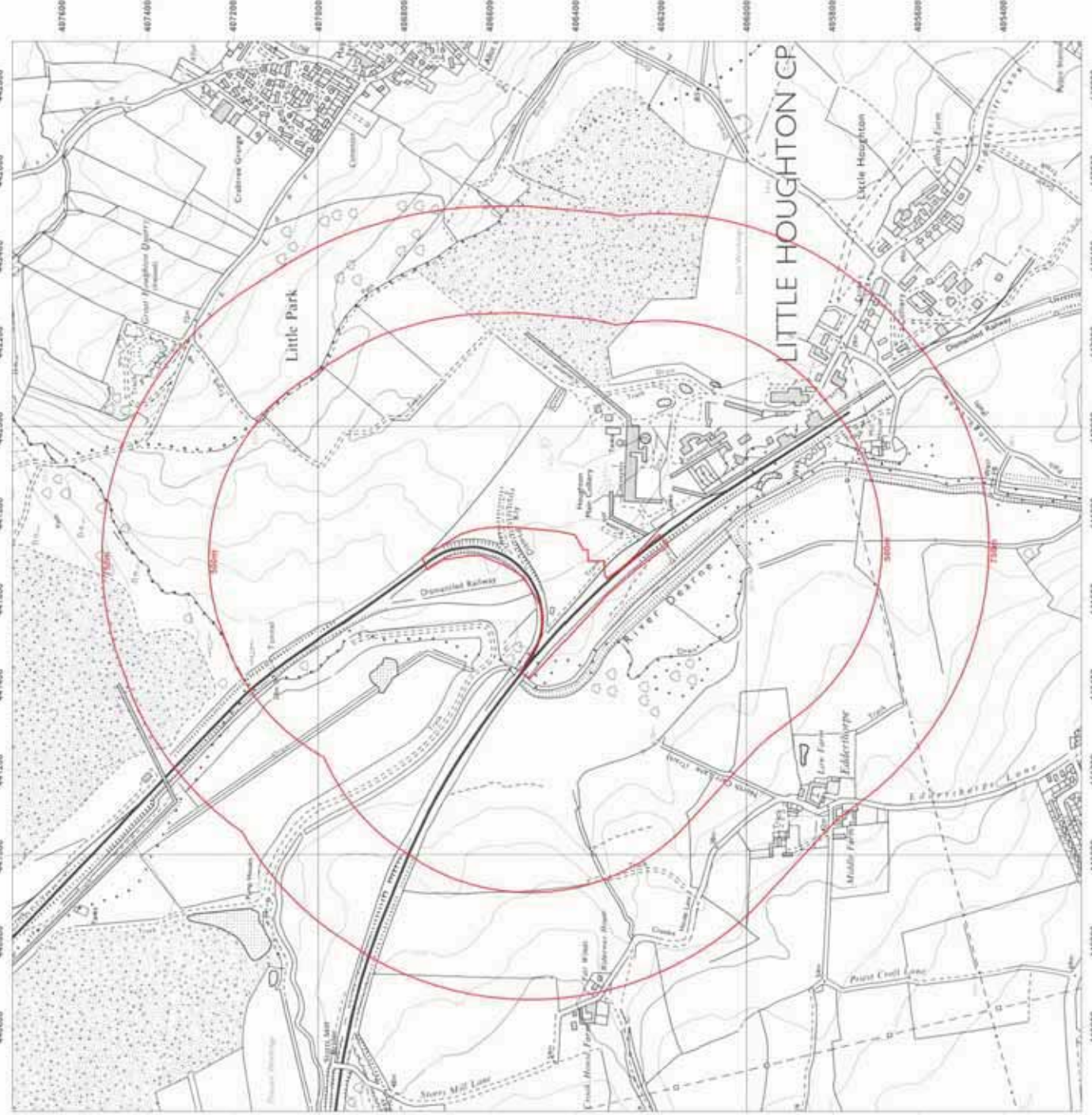


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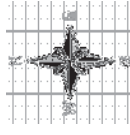
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1981

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1980
Revised 1981
Edition N/A
Copyright N/A
Levelled N/A



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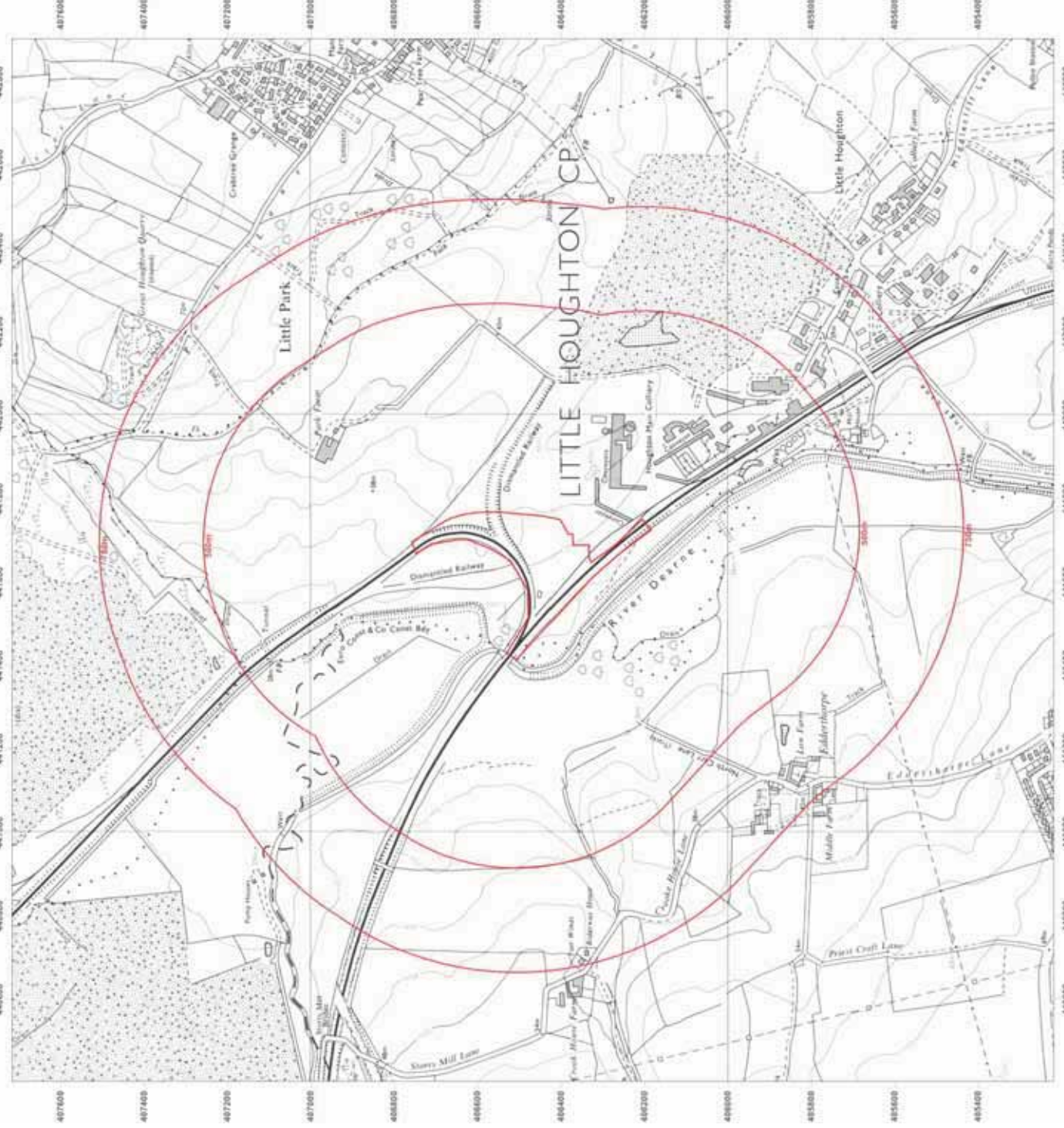


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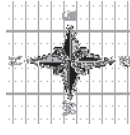
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: Provisional

Map date: 1967

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A



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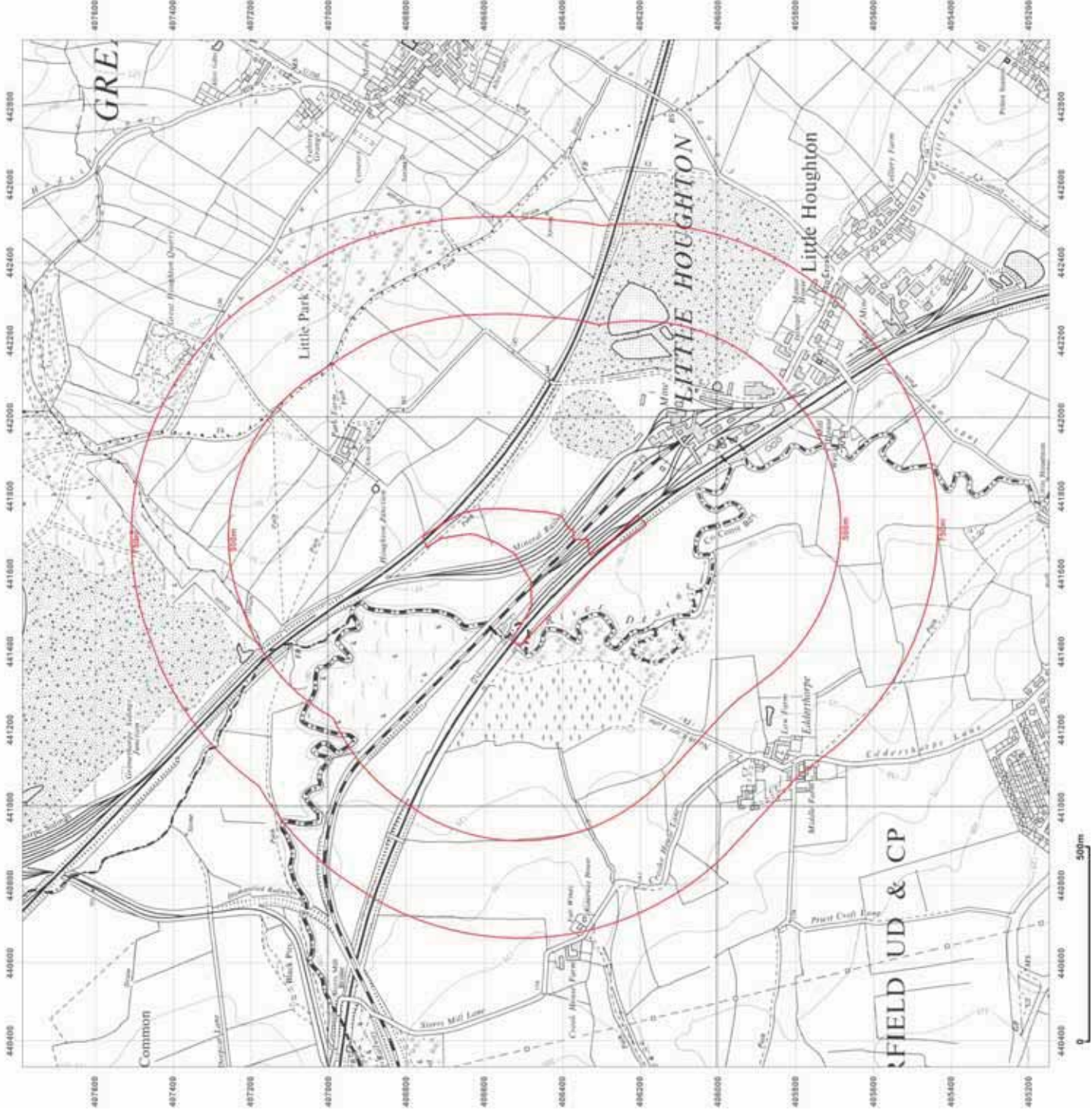


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Site Details:

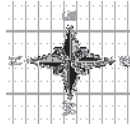
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Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: Provisional

Map date: 1955

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1951
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A



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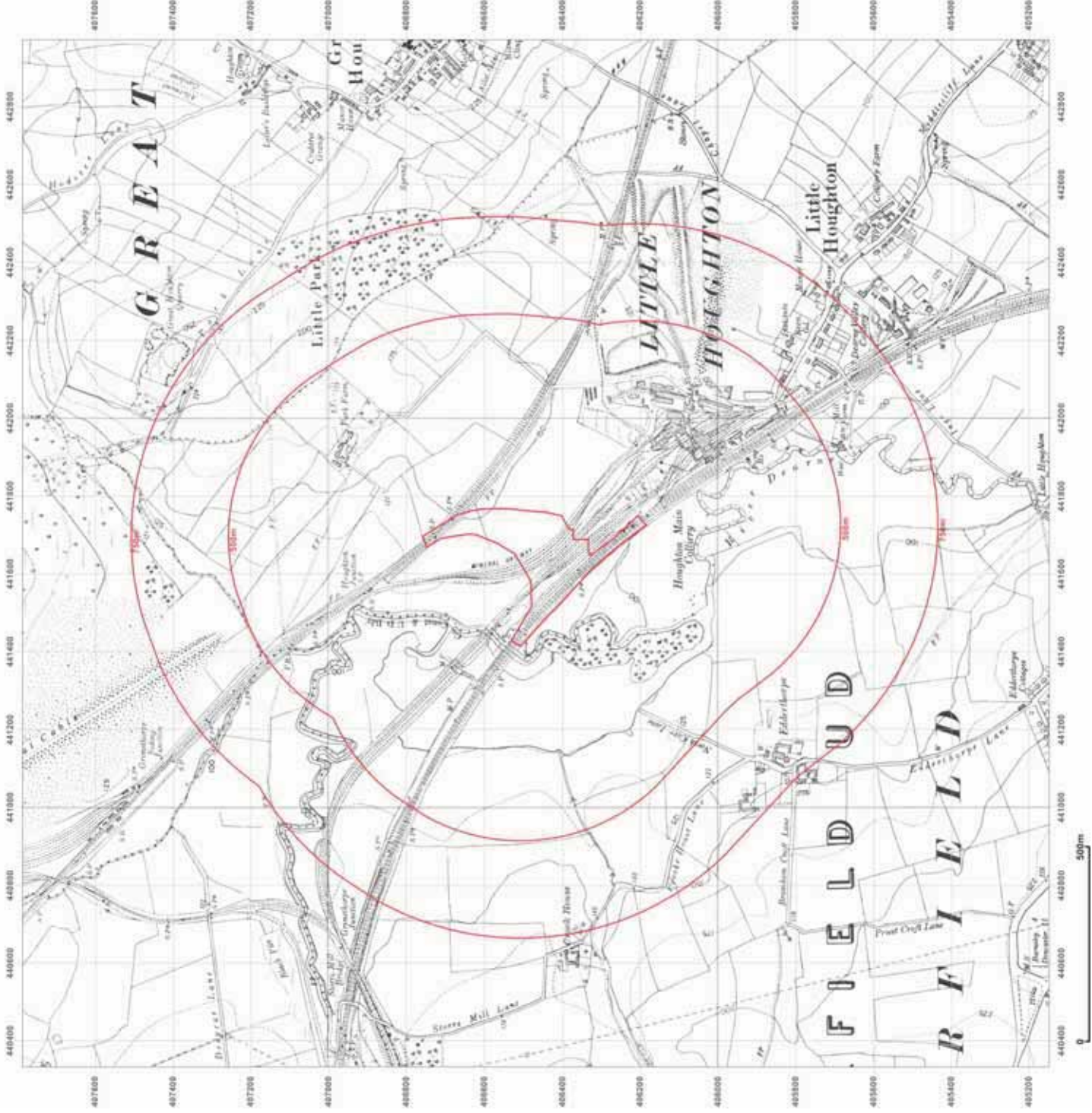


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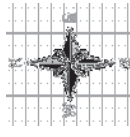
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Grid Ref: 441652, 406467

Map Name: County Series

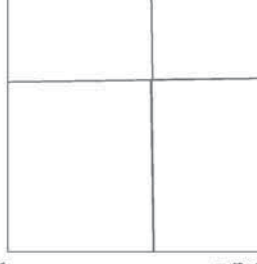
Map date: 1948

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
 Revised 1948
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1851
 Revised 1948
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1820
 Revised 1948
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1850
 Revised 1948
 Edition 1948
 Copyright N/A
 Levelled N/A



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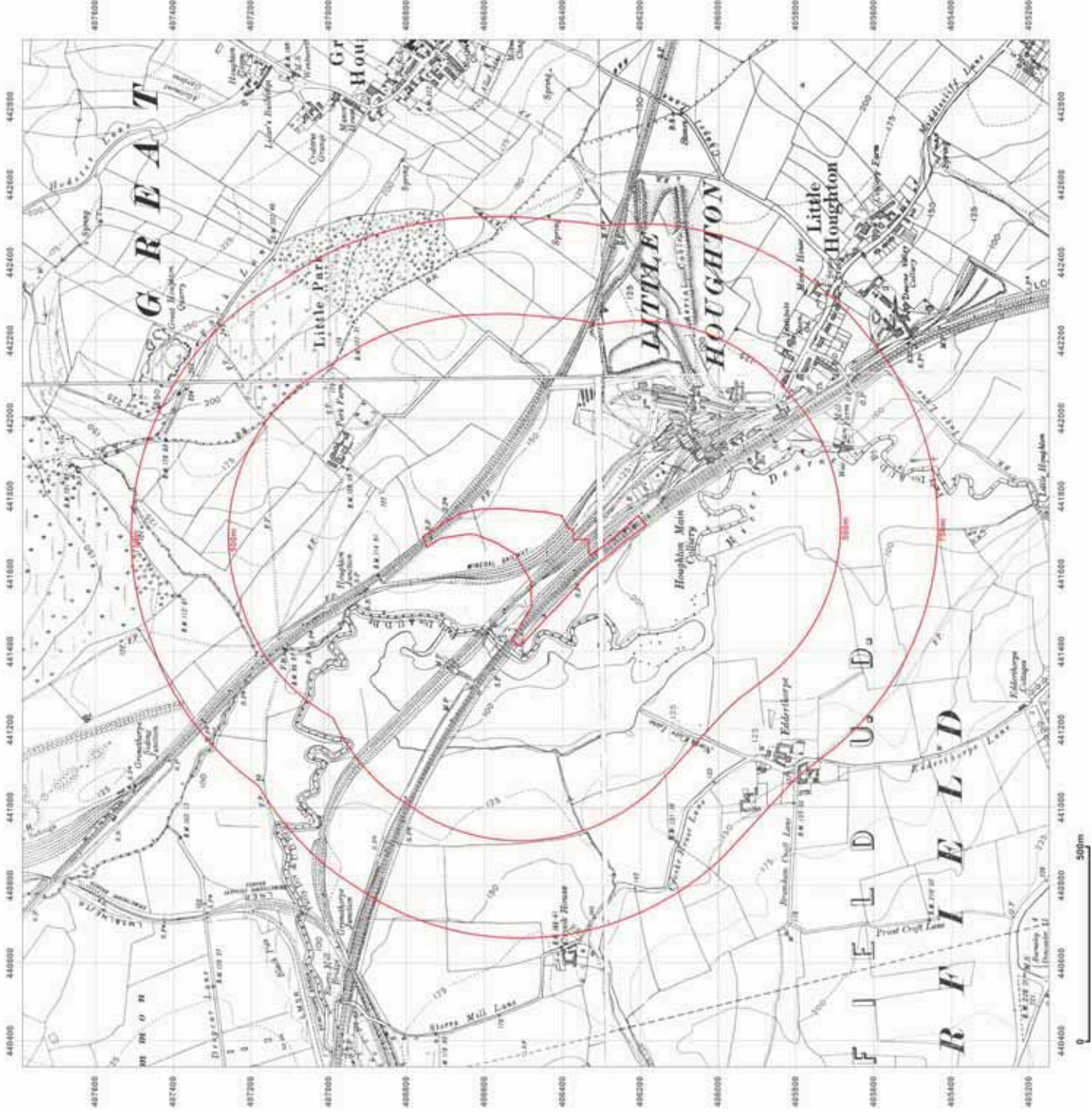


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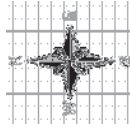
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Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: County Series

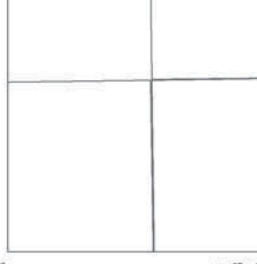
Map date: 1938-1939

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1851
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1850
Revised 1939
Edition N/A
Copyright N/A
Levelled N/A



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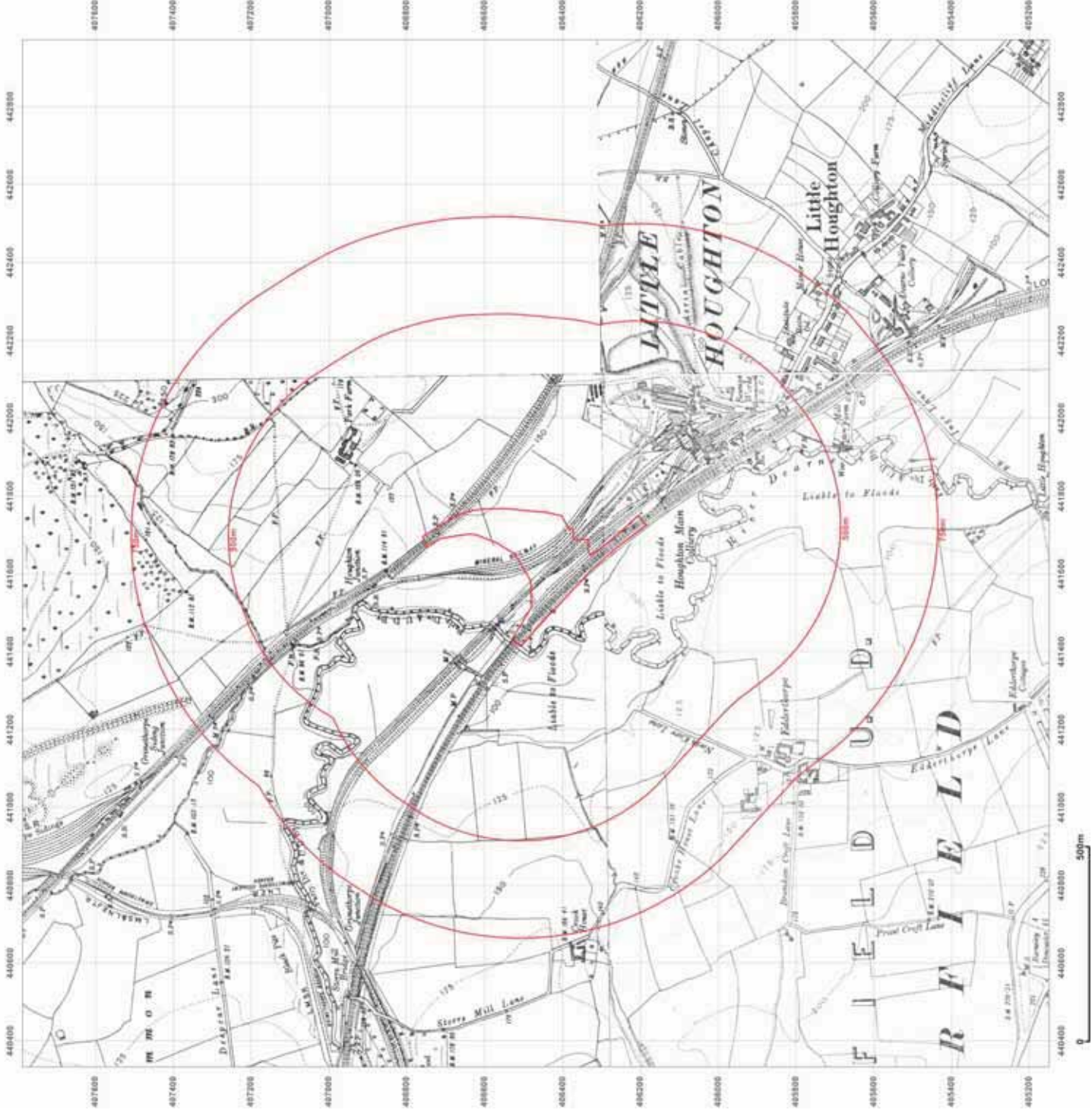


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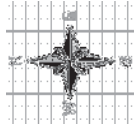
Client Ref: EMS_245265_329170
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Grid Ref: 441652, 406467

Map Name: County Series

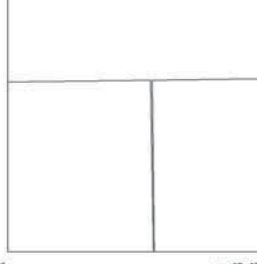
Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A



Surveyed 1851
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A



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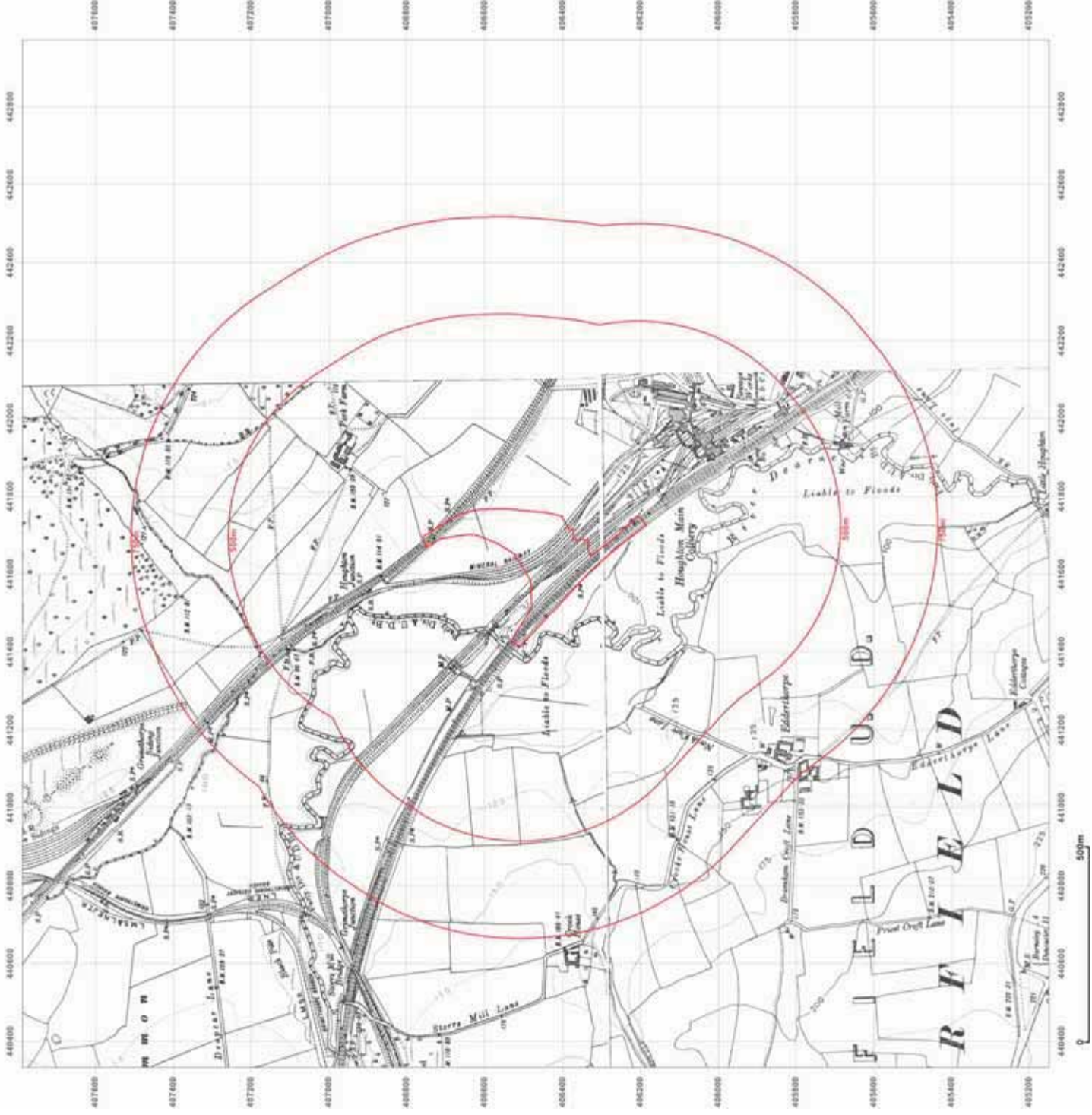


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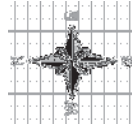
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Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: County Series

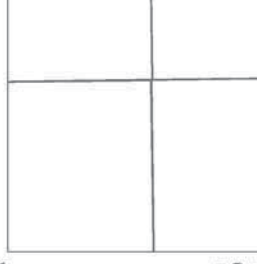
Map date: 1929-1932

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
 Revised 1930
 Edition 1932
 Copyright N/A
 Levelled N/A



Surveyed 1851
 Revised 1929
 Edition 1931
 Copyright N/A
 Levelled N/A

Surveyed 1850
 Revised 1932
 Edition 1932
 Copyright N/A
 Levelled N/A

Surveyed 1850
 Revised 1929
 Edition N/A
 Copyright N/A
 Levelled N/A



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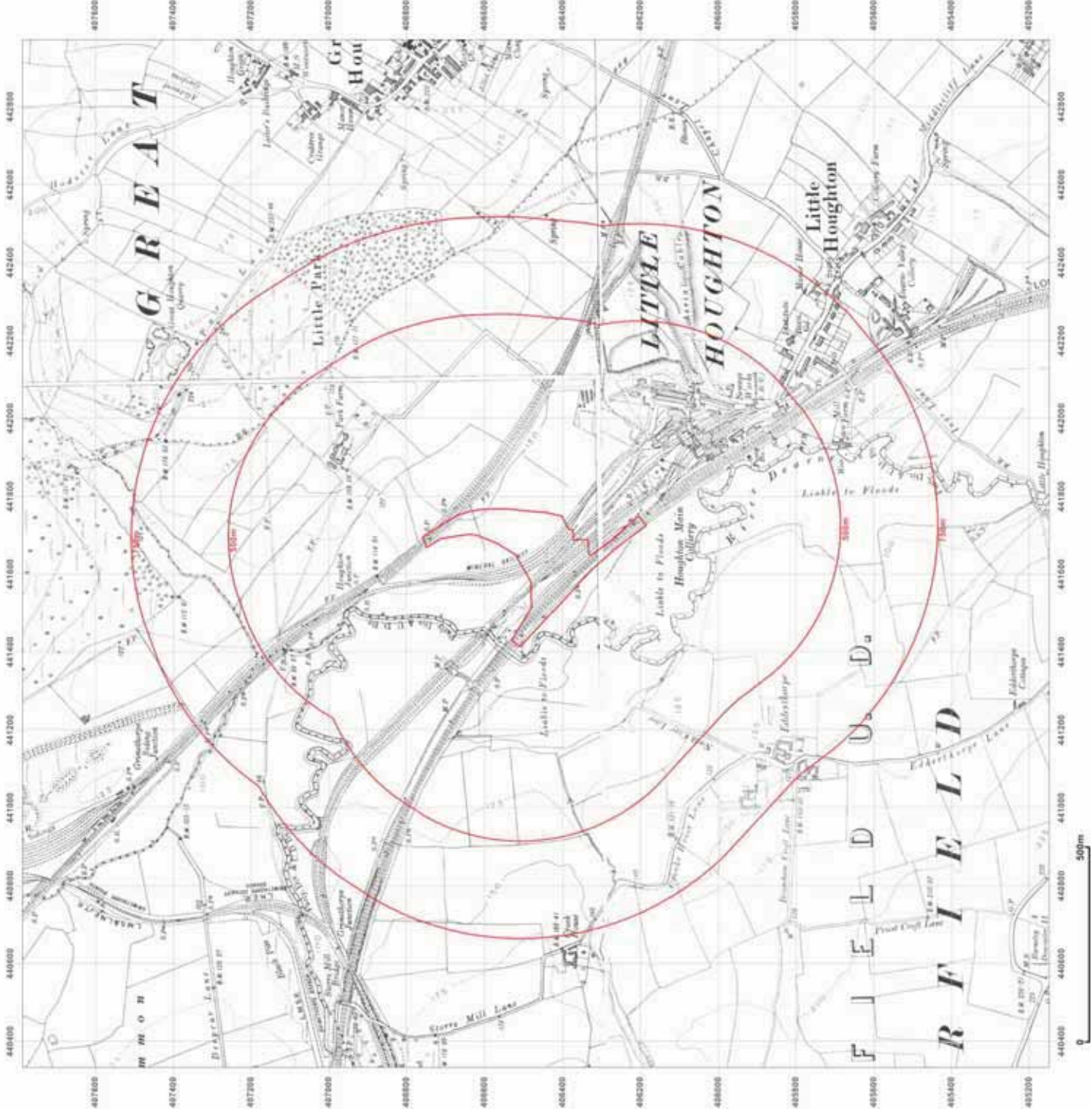


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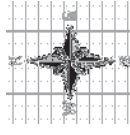
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Grid Ref: 441652, 406467

Map Name: County Series

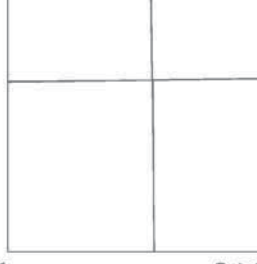
Map date: 1904

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1890
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1890
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1891
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1890
 Revised 1904
 Edition N/A
 Copyright N/A
 Levelled N/A



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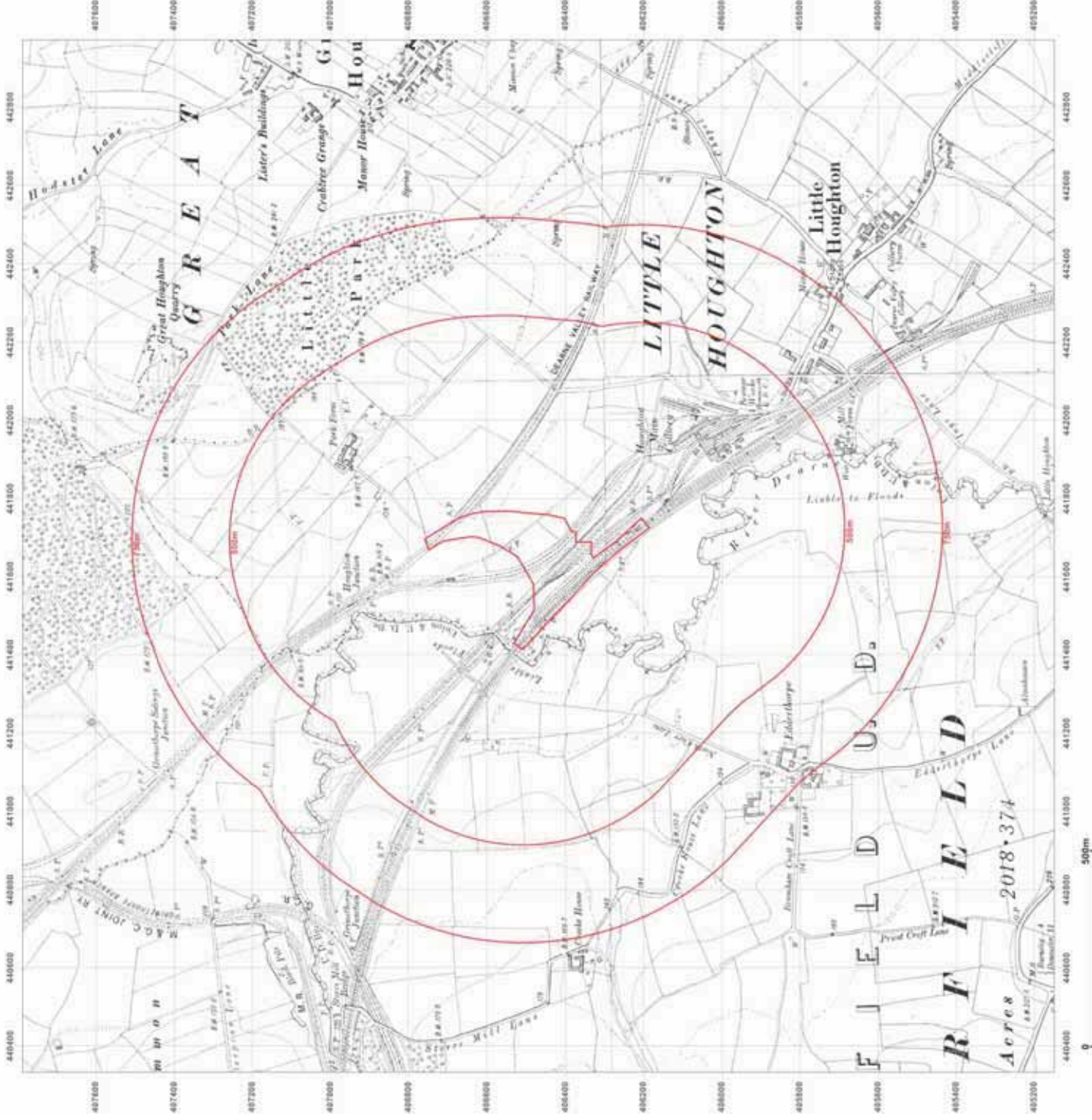


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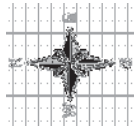
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Grid Ref: 441652, 406467

Map Name: County Series

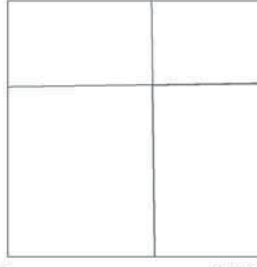
Map date: 1890

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1890
 Revised 1890
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1890
 Revised 1890
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1890
 Revised 1890
 Edition N/A
 Copyright N/A
 Levelled N/A



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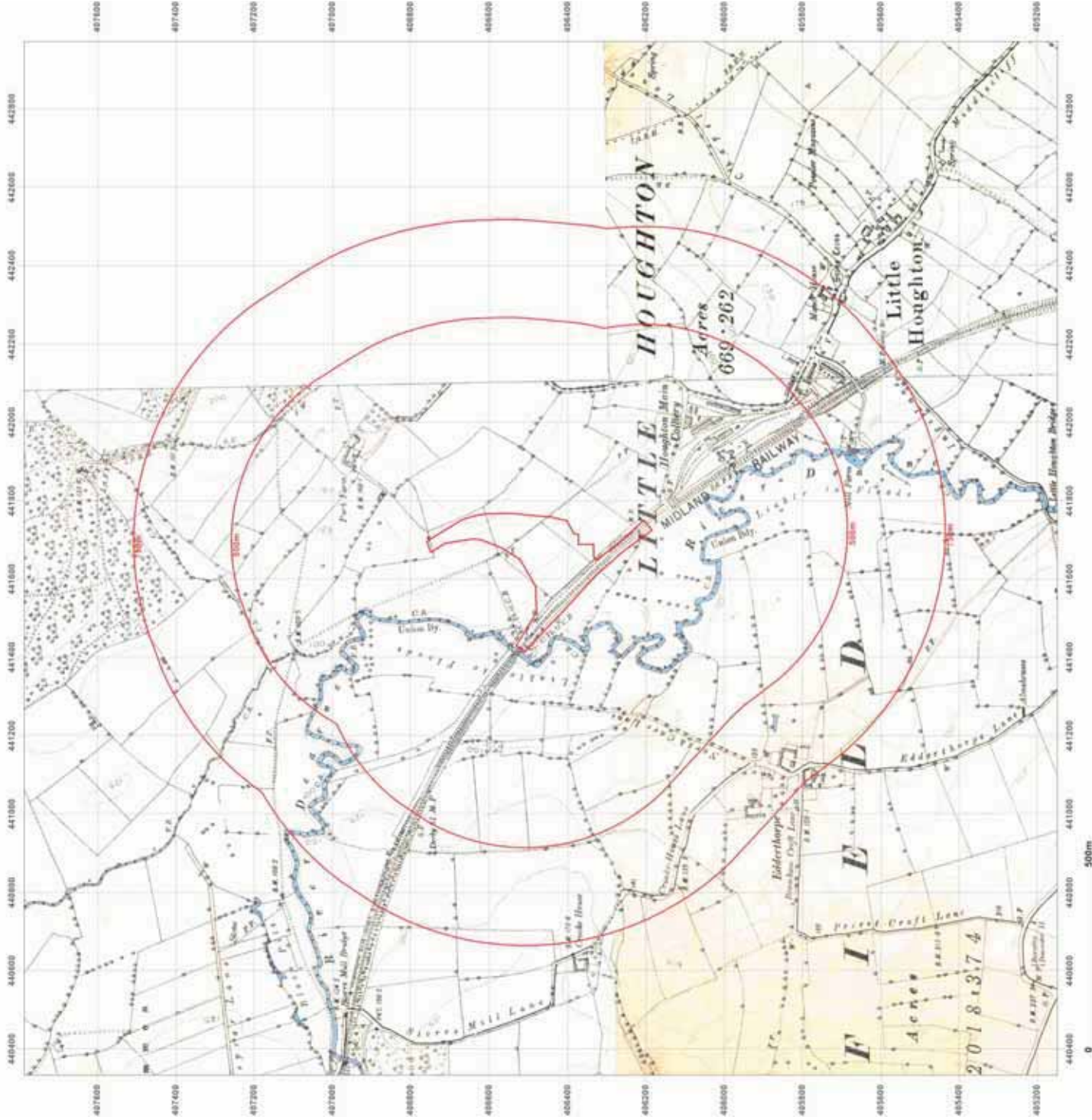


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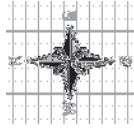
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: County Series

Map date: 1850

Scale: 1:10,560

Printed at: 1:10,560



Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



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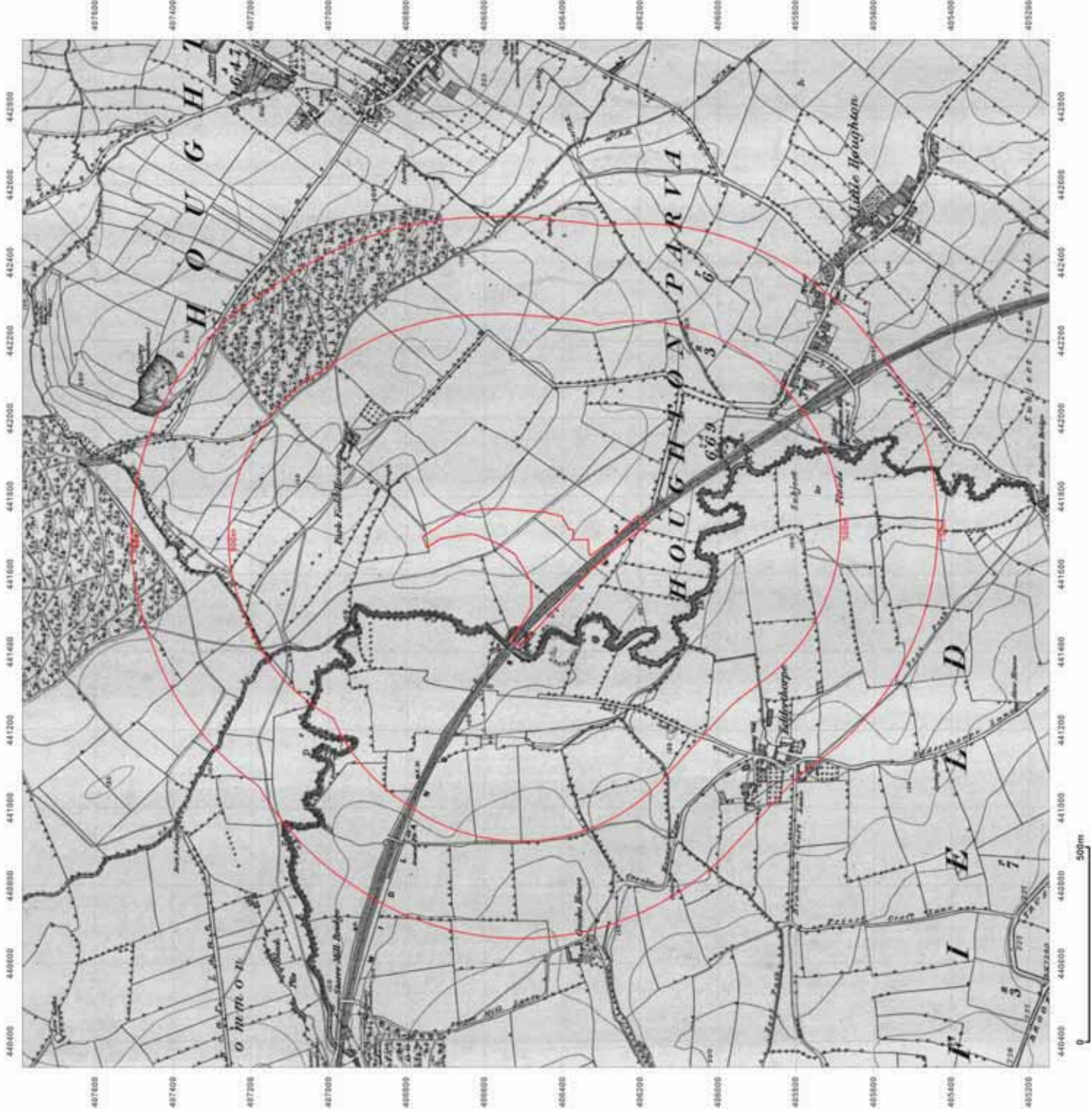


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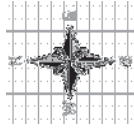
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: MasterMap

Map date: 2012

Scale: 1:1,250

Printed at: 1:2,500



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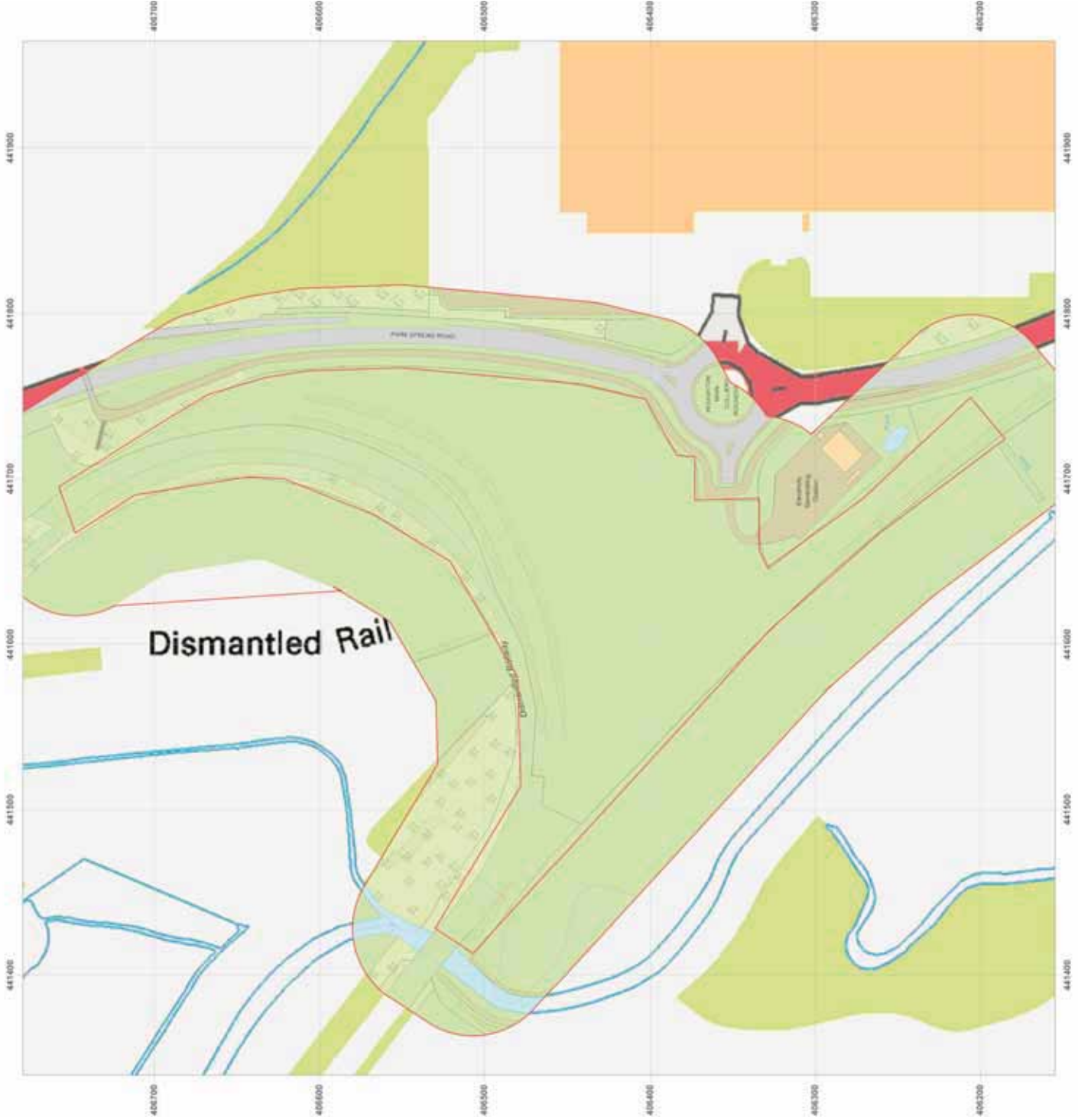


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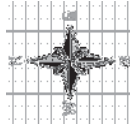
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A



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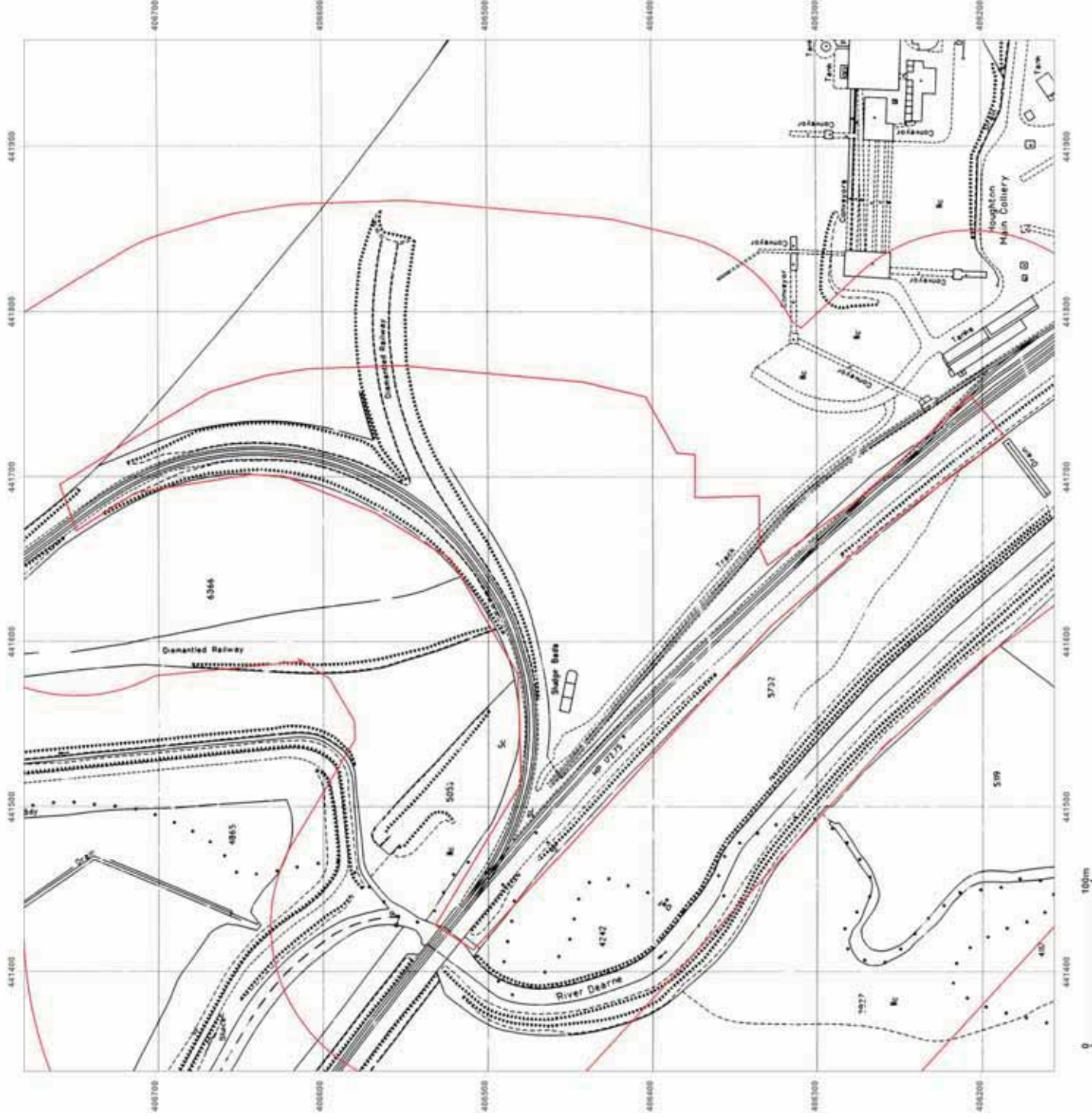


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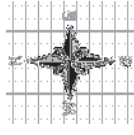
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1985

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



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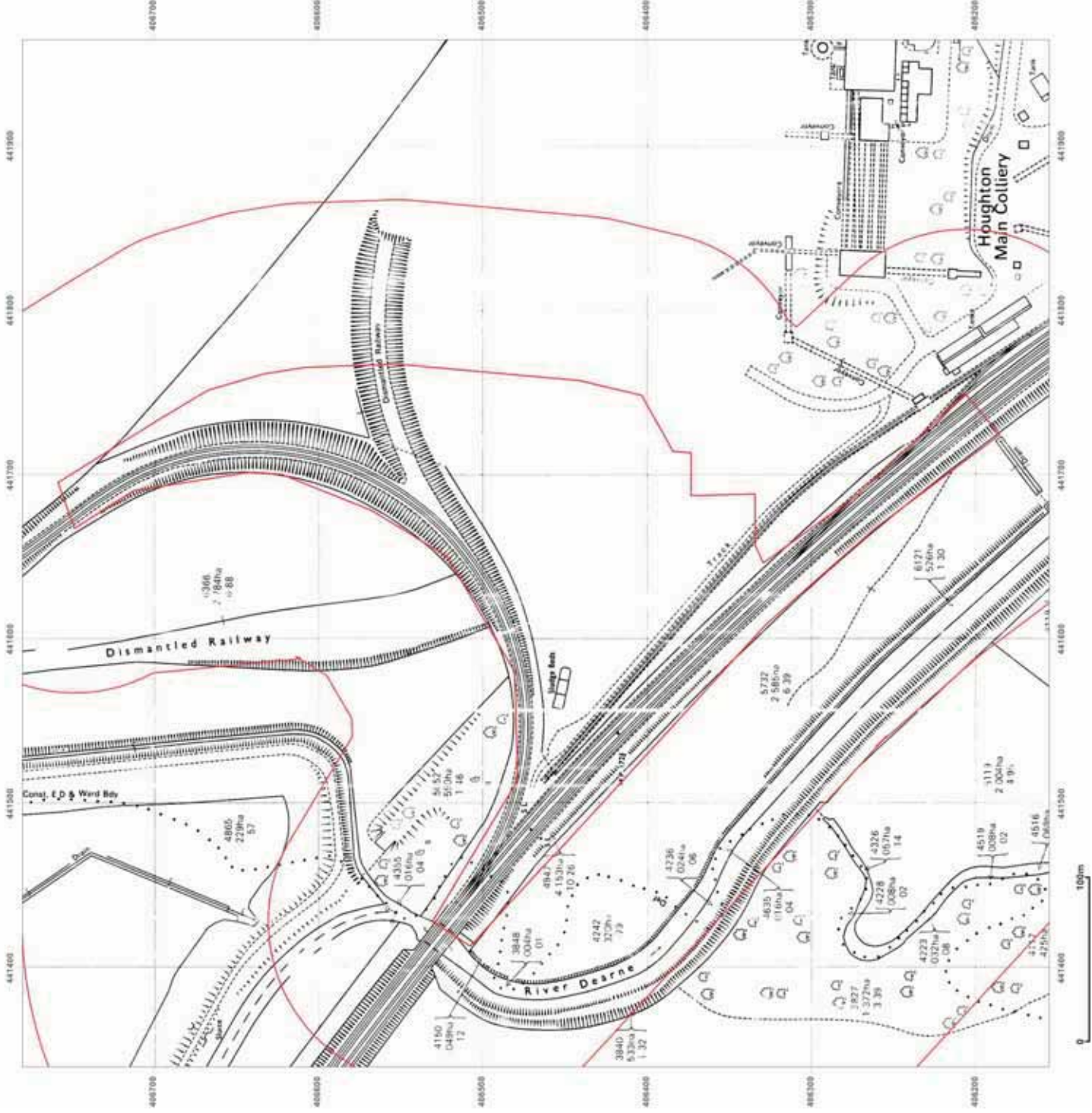


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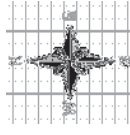
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Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1983

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1983
Revised 1983
Edition N/A
Copyright 1985
Levelled 1964



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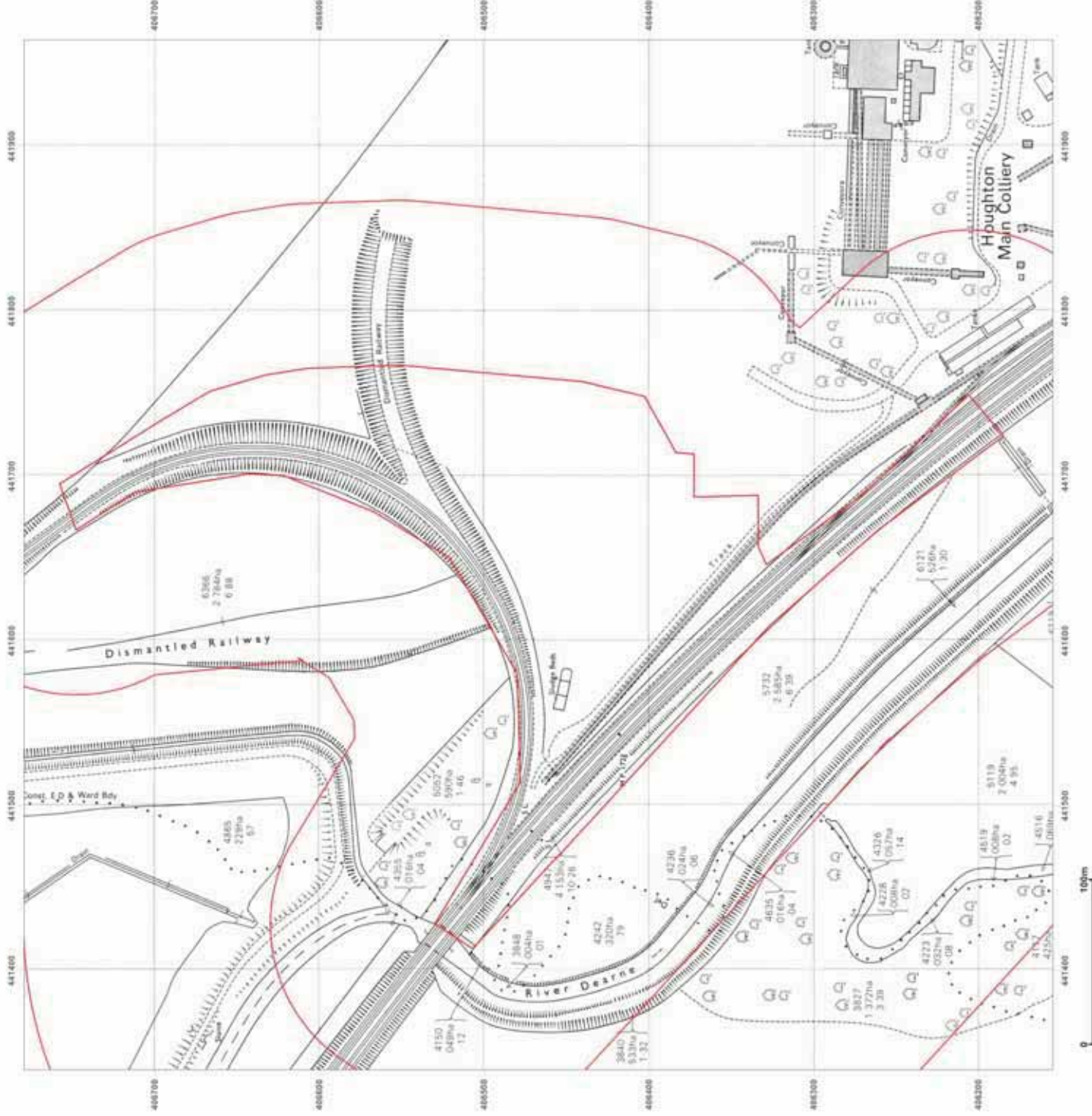


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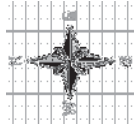
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Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1980

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1980
Revised 1980
Edition N/A
Copyright 1981
Levelled 1964



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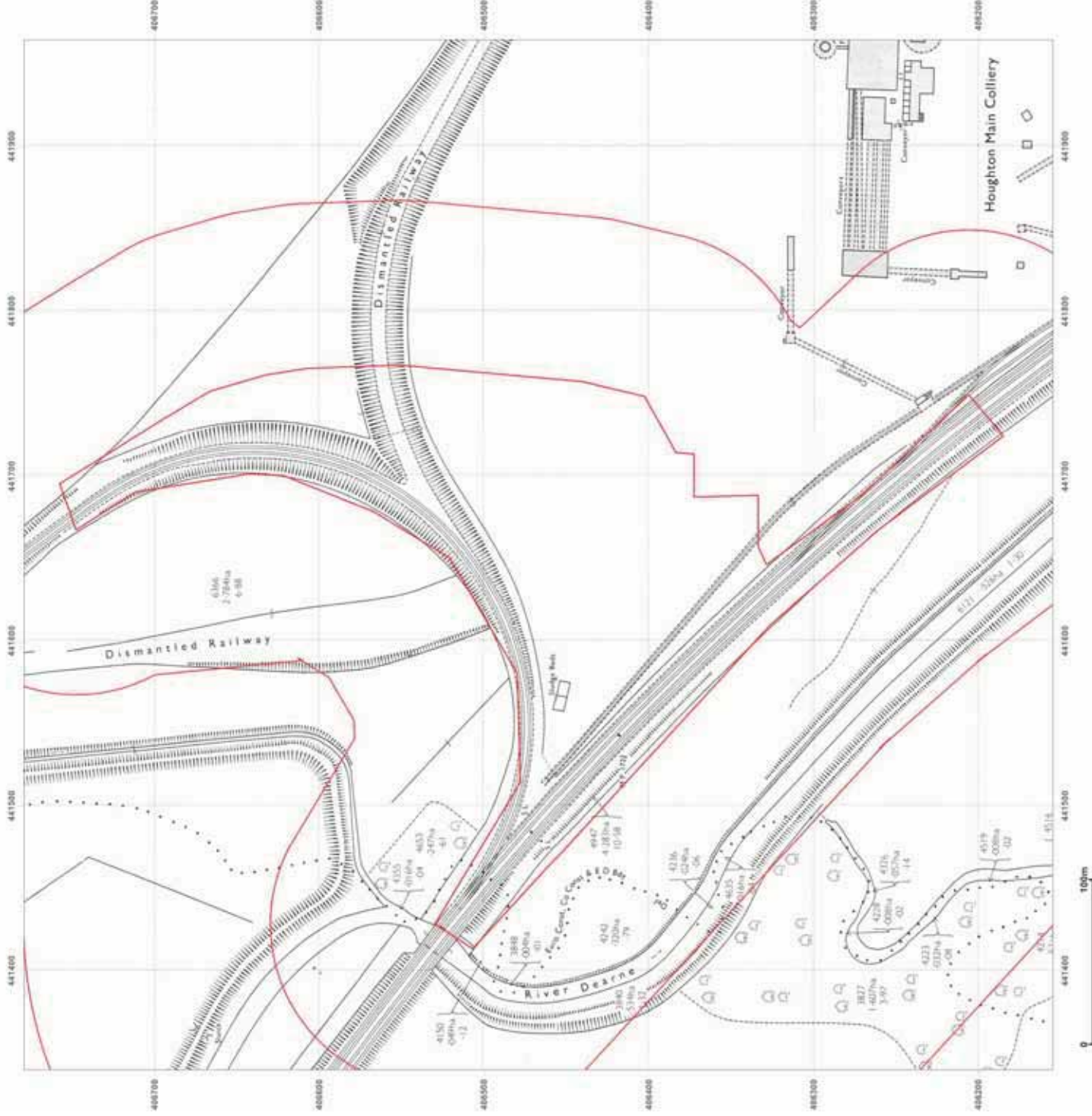


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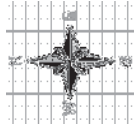
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1962

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



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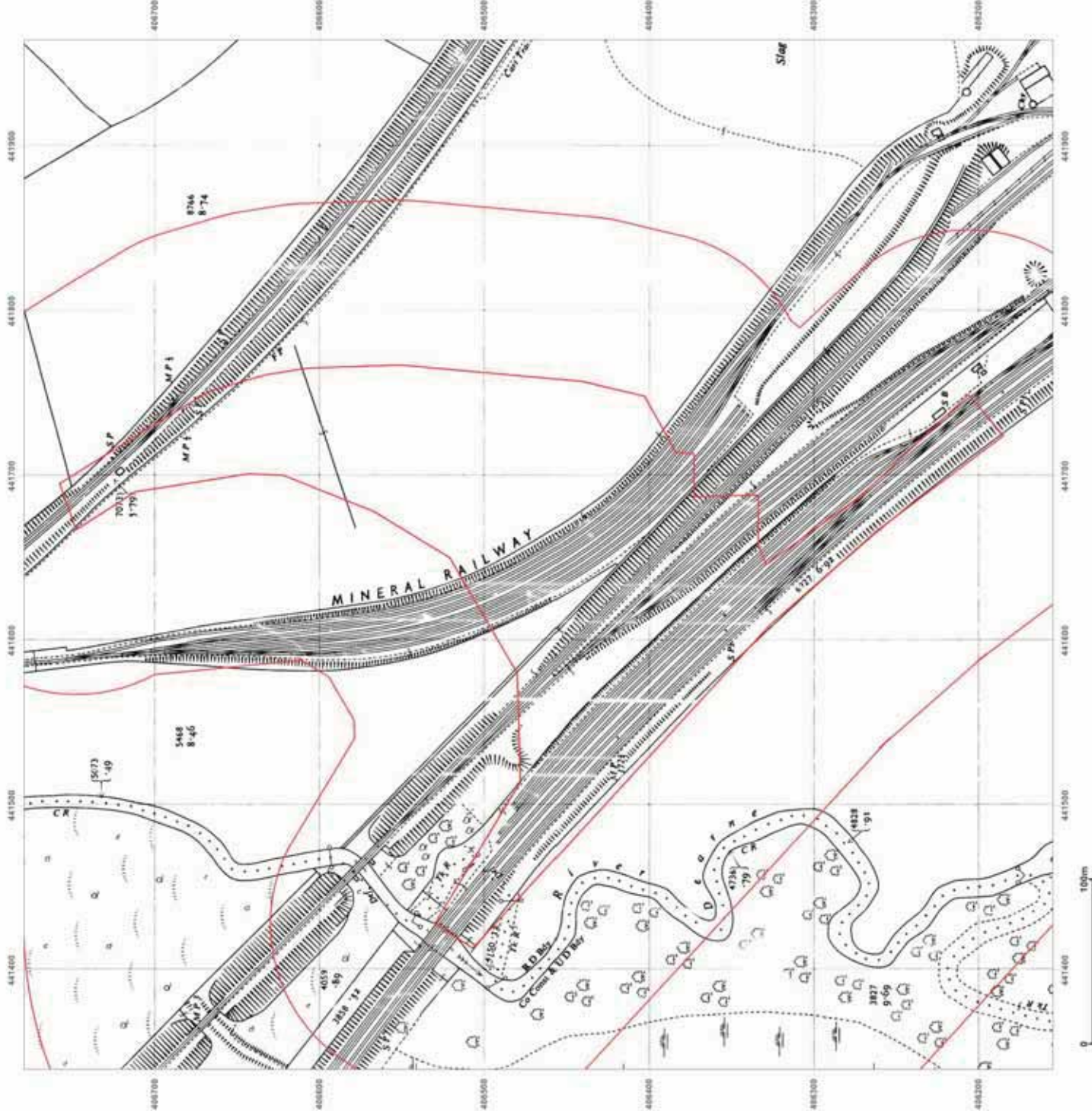


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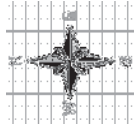
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: National Grid

Map date: 1961

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1961
Revised 1961
Edition N/A
Copyright 1982
Levelled 1959



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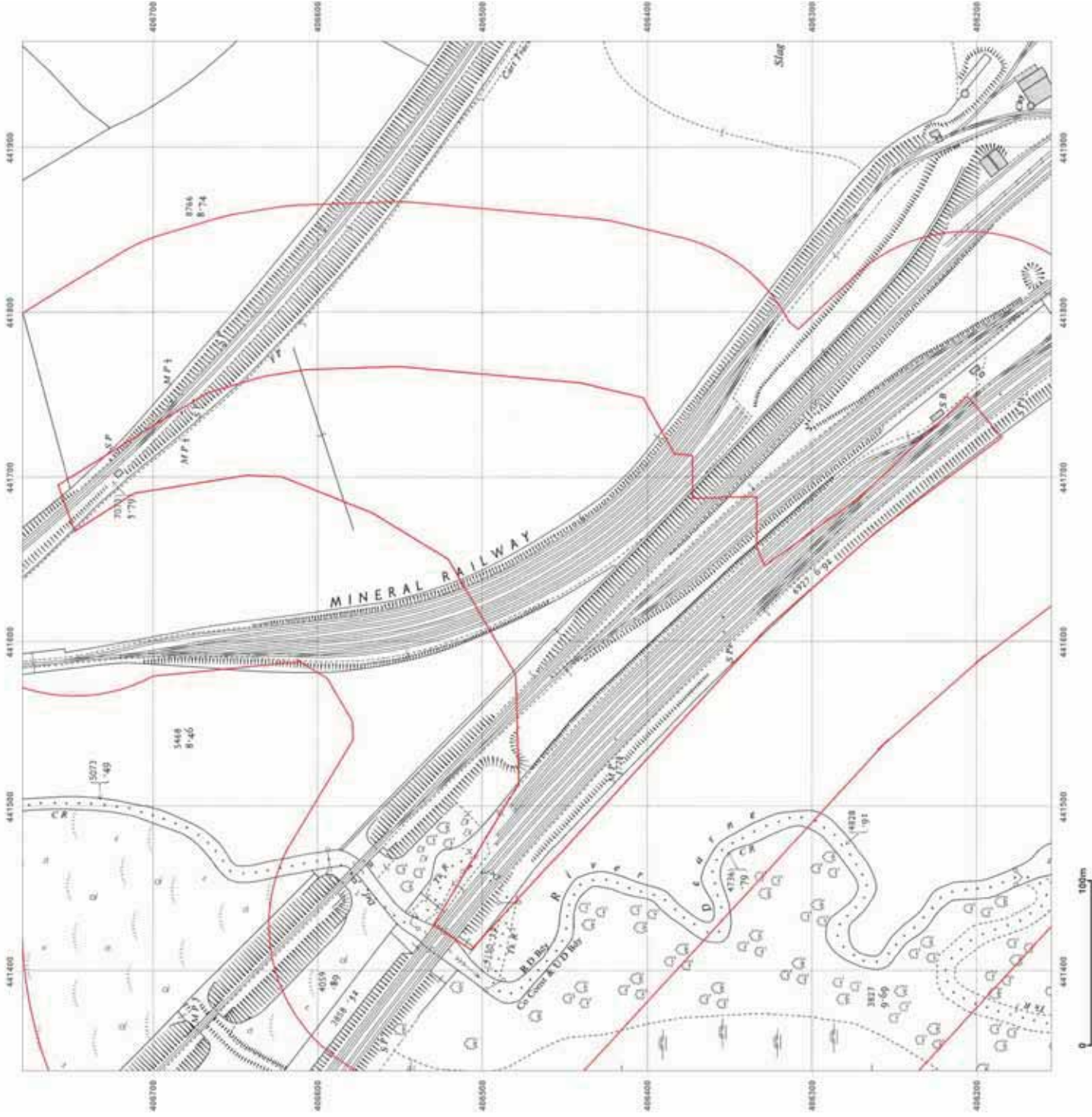


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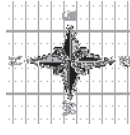
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Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: County Series

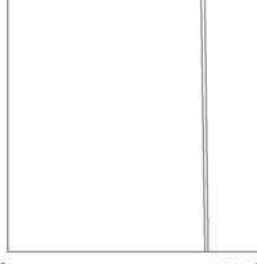
Map date: 1931

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1931
 Revised 1931
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1931
 Revised 1931
 Edition N/A
 Copyright N/A
 Levelled N/A



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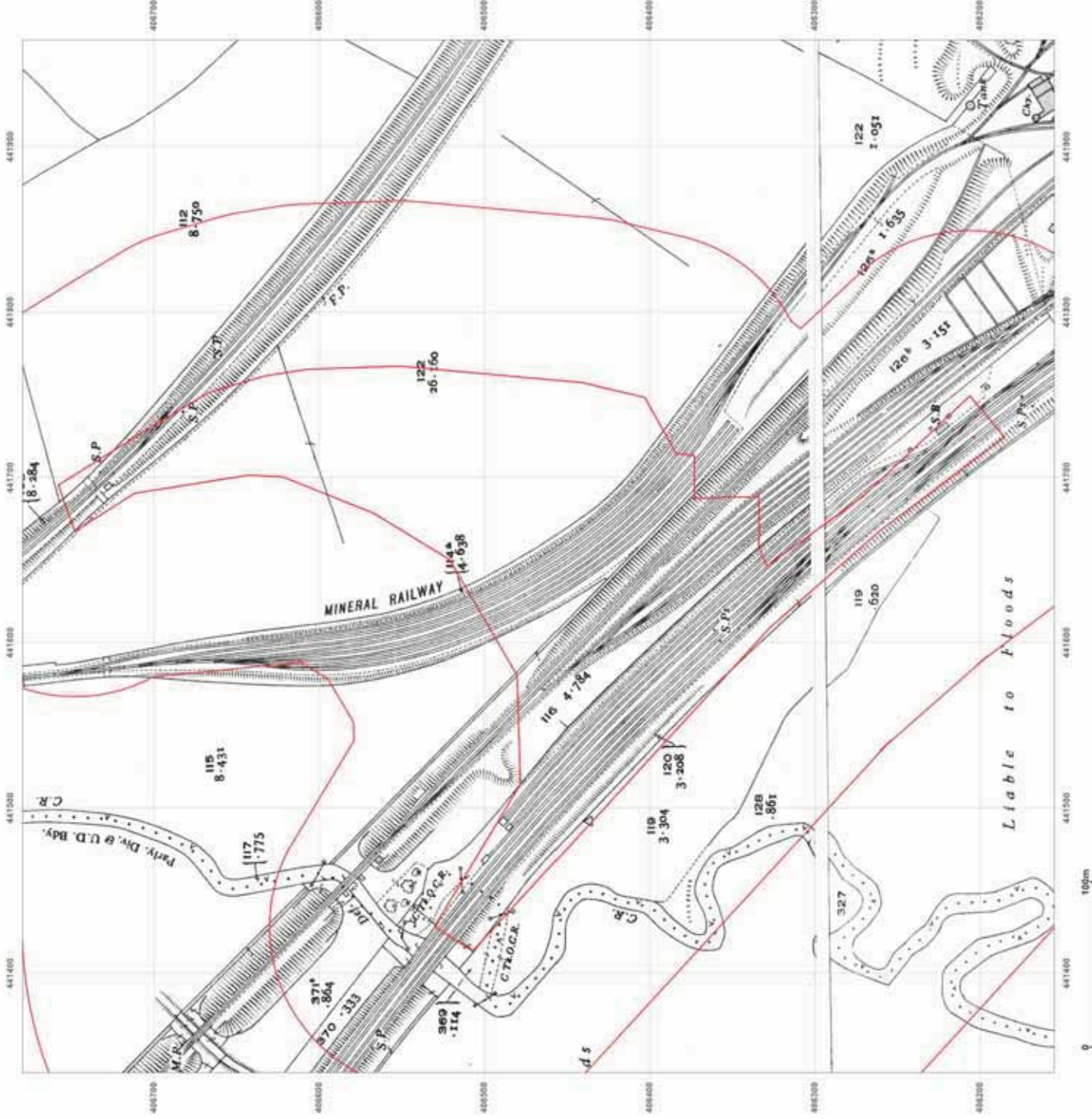


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Site Details:

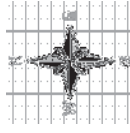
Client Ref: EMS_245265_329170
Report Ref: EMS-245265_329170
Grid Ref: 441652, 406467

Map Name: County Series

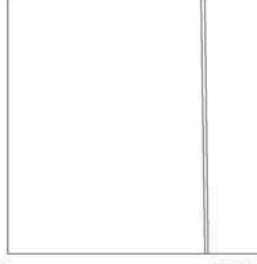
Map date: 1906

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1906
 Revised 1906
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1906
 Revised 1906
 Edition N/A
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 Levelled N/A



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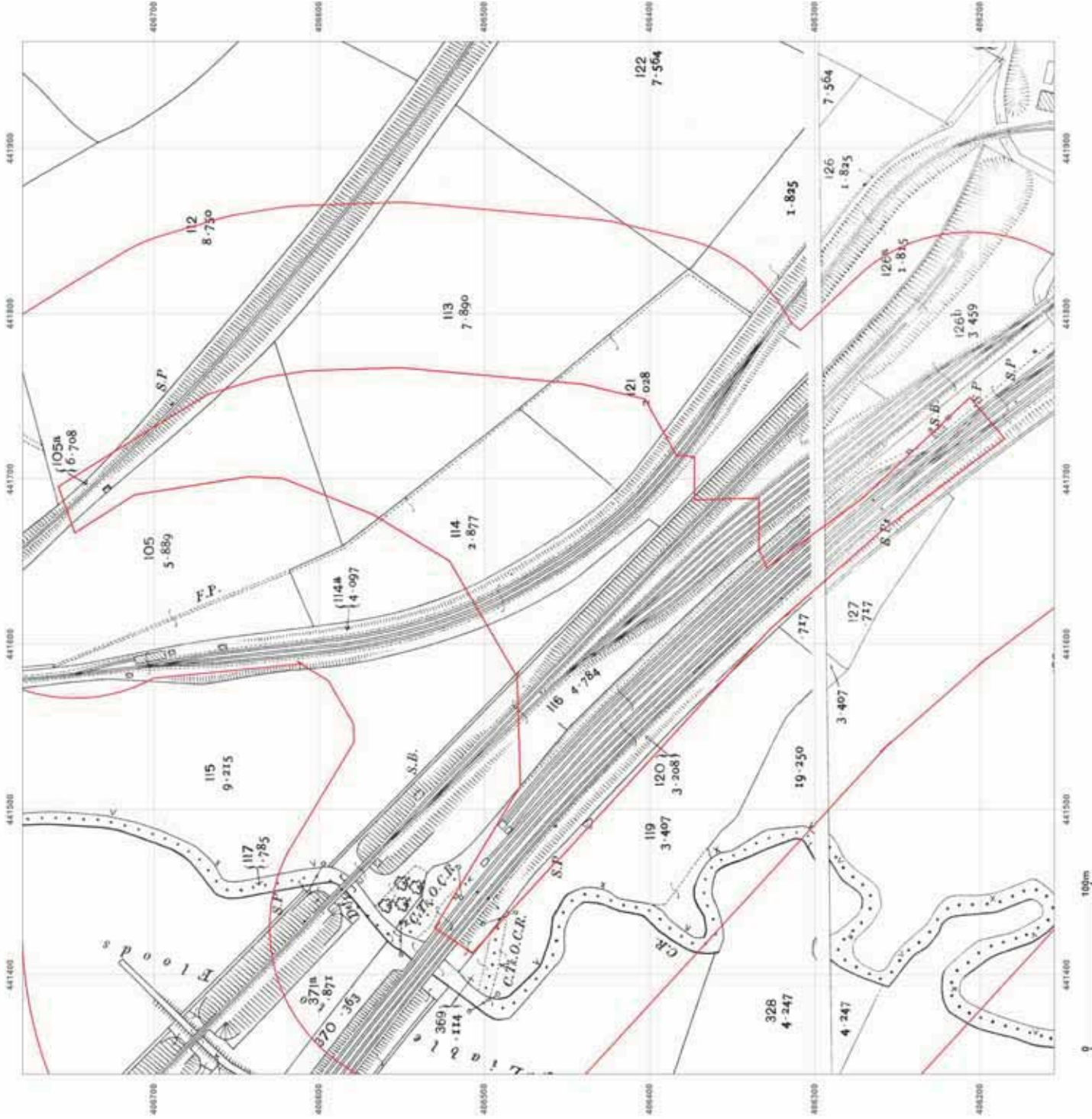


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Site Details:

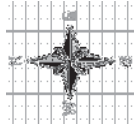
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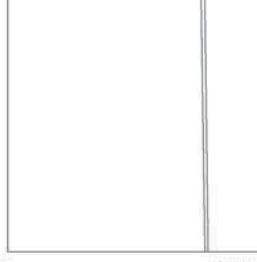
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Printed at: 1:2,500



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Edition N/A
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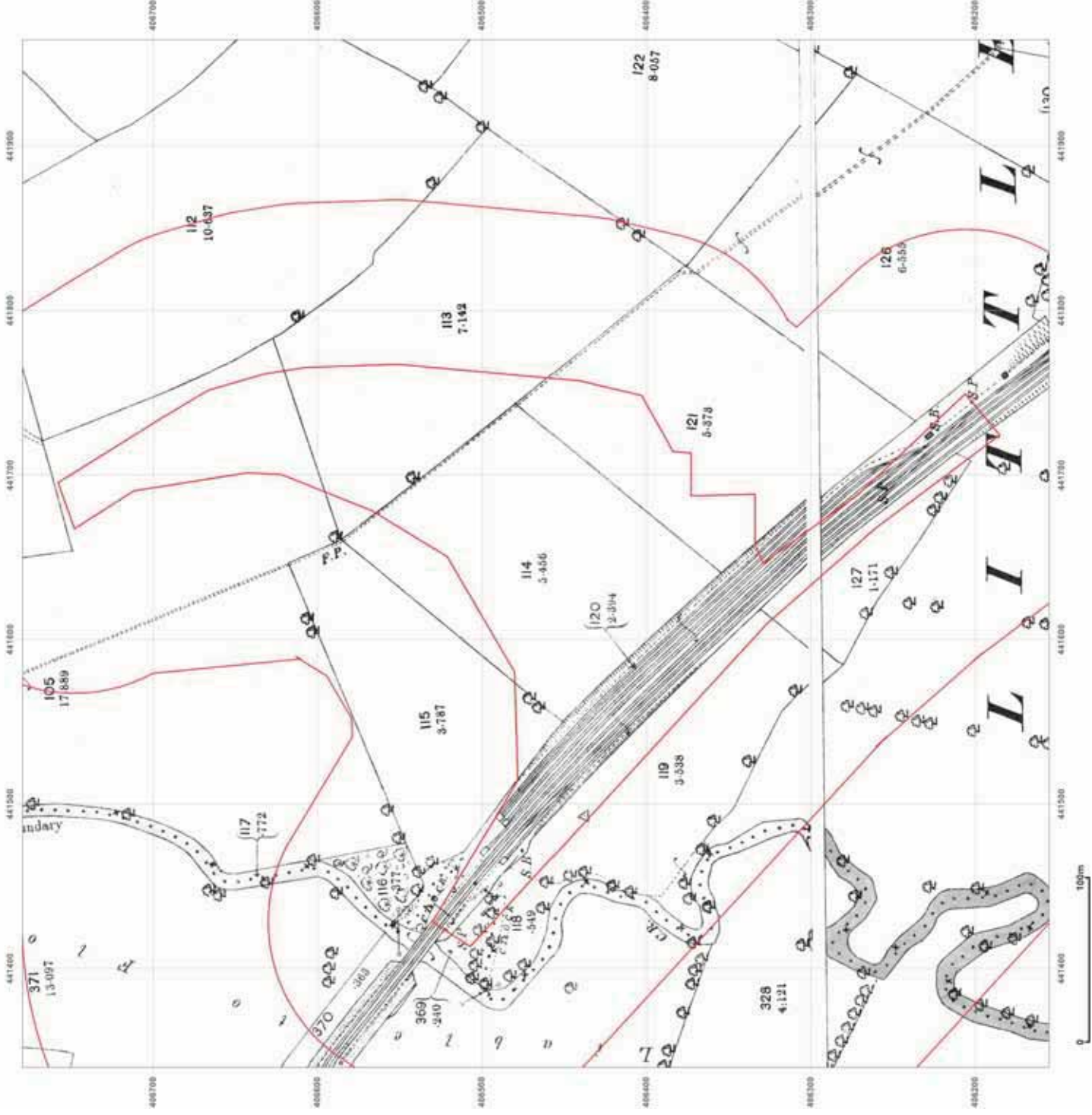


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Site Houghton Main, Barnsley			TP10
Job No CRM.066.002	Dates Start 26-08-14 Finish 26-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
				0.25			(MADE GROUND) Grass over soft to firm, blue grey mottled yellow brown slightly sandy gravelly clay with black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, and occasional cobbles and boulders of mudstone, carbonised mudstone and sandstone.	0
	0.90	ES		1.00			(MADE GROUND) Blue grey mottled orange red occasionally slightly sandy clayey gravel with occasional black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, cobbles of mudstone and carbonised mudstone, and boulders of mudstone.	1
				2.80			(MADE GROUND) Blue grey mottled light grey and orange red occasionally slightly sandy clayey gravel with occasional black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, cobbles of mudstone and carbonised mudstone, and boulders of mudstone.	2
				{4.00}			Trial Pit completed at 2.80m.	3
								4

General Remarks
 Dimensions: 3.10x0.69x2.80
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

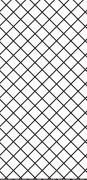
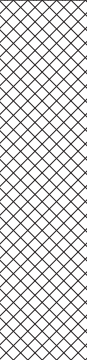
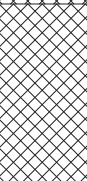
All dimensions in metres Scale 1:25	Logged By N.M
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Site Houghton Main, Barnsley			TP11
Job No CRM.066.002	Dates Start 27-08-14 Finish 27-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.60			(MADE GROUND) Grass over firm, blue grey mottled orange slightly sandy gravelly clay with occasional rootlets and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, and cobbles of mudstone and occasional cobbles of sandstone.	0
				1.80			(MADE GROUND) Blue grey mottled red orange and white grey slightly clayey and silty gravel with black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, and cobbles of mudstone and carbonised mudstone, and occasional boulders of mudstone and sandstone.	1
				2.40			(MADE GROUND) Blue grey mottled white grey slightly clayey and silty gravel. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, and cobbles of mudstone and carbonised mudstone, and boulders of mudstone.	2
				{4.00}			Trial Pit completed at 2.40m.	3
								4

General Remarks
 Dimensions: 2.82x0.68x2.40
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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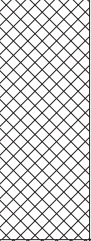
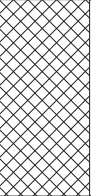
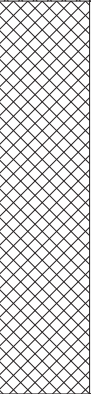
1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			TP12
Job No CRM.066.002	Dates Start 27-08-14 Finish 27-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.70	ES		0.80			(MADE GROUND) Grass over firm, grey brown occasionally blue grey mottled yellow brown and orange slightly sandy gravelly clay with occasional rootlets and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, cobbles of mudstone and carbonised mudstone, and occasional cobbles of sandstone.	0
				1.45			(MADE GROUND) Blue grey mottled white grey and red orange slightly clayey and silty gravel with black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, cobbles of mudstone, carbonised mudstone, and occasional boulders of mudstone and sandstone.	1
				2.75			(MADE GROUND) Blue grey mottled white grey slightly clayey and silty gravel. Gravel is fine to coarse, angular and subangular mudstone and carbonised mudstone, cobbles of mudstone and carbonised mudstone, and boulders of mudstone.	2
				{4.00}			Trial Pit completed at 2.75m.	3
								4

General Remarks
 Dimensions: 3.22x0.68x2.75
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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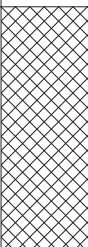
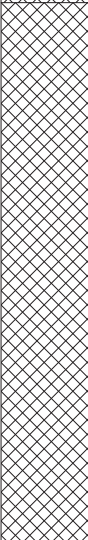
1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			TP13
Job No CRM.066.002	Dates Start 27-08-14 Finish 27-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.20	ES		0.80			(MADE GROUND) Grass over firm, grey brown occasionally blue grey mottled dark grey and orange slightly sandy gravelly clay with frequent rootlets and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, sandstone, ash, and cobbles of mudstone.	0
				2.60			(MADE GROUND) Blue grey mottled orange brown and white grey slightly clayey and silty gravel. Gravel is fine to coarse, angular and subangular mudstone, cobbles of carbonised mudstone, and cobbles and boulders of mudstone.	1
				{4.00}			Trial Pit completed at 2.60m.	2
								3
								4

General Remarks
 Dimensions: 2.70x0.63x2.60
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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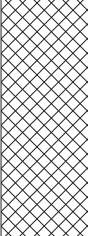
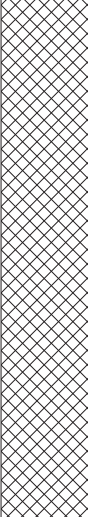
1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			TP14
Job No CRM.066.002	Dates Start 27-08-14 Finish 27-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.75	ES		0.80			(MADE GROUND) Grass over firm, grey brown occasionally blue grey mottled orange and yellow brown slightly sandy gravelly clay with occasional rootlets, and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, sandstone, ash and occasional bricks, and cobbles of mudstone and sandstone.	0
							(MADE GROUND) Blue grey mottled yellow brown and white grey slightly clayey and silty gravel with occasional black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, sandstone, cobbles of mudstone, carbonised mudstone and occasional sandstone, and boulders of mudstone and carbonised mudstone.	1
				2.55				2
				{4.00}			Trial Pit completed at 2.55m.	3
								4

General Remarks
 Dimensions: 2.66x0.68x2.55
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			TP15
Job No CRM.066.002	Dates Start 27-08-14 Finish 27-08-14	Ground Level (m) Co-Ordinates	
Client Peel Environmental Ltd			Sheet 1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.40	ES		0.30			(MADE GROUND) Grass over firm, blue grey mottled green grey slightly sandy clayey gravel with occasional rootlets, and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, sandstone, and cobbles of mudstone, carbonised mudstone and sandstone.	0
			0.55				(MADE GROUND) Dark grey brown mottled blue grey slightly sandy silty gravel with frequent rootlets, and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, sandstone, occasional ash and bricks.	
			2.20				(MADE GROUND) Blue grey mottled white grey slightly clayey and silty gravel. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, occasional sandstone, cobbles and boulders of mudstone, carbonised mudstone and occasional sandstone.	1
							Trial Pit completed at 2.20m.	2
				{4.00}				4

General Remarks
 Dimensions: 2.78x0.66x2.20
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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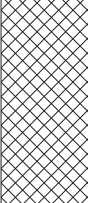
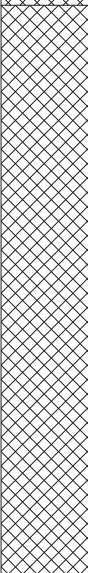
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Site Houghton Main, Barnsley			TP16
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.70			(MADE GROUND) Grass over brown grey occasionally blue grey mottled yellow brown slightly sandy and silty clayey gravel with occasional rootlets, and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, sandstone, cobbles and boulders of mudstone, carbonised mudstone and sandstone.	0
							(MADE GROUND) Blue grey occasionally light green mottled red orange and white grey gravel. Gravel is cobbles and boulders, angular and subangular mudstone and sandstone (Possible natural strata).	1
				2.60			Trial Pit completed at 2.60m.	2
				{4.00}				3
								4

General Remarks
 Dimensions: 3.66x0.69x2.60
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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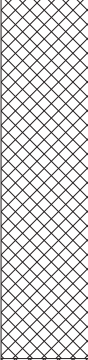
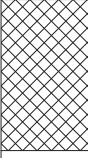
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Site Houghton Main, Barnsley			TP17
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
----------------------------------	-----------------

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.55	ES		1.20			(MADE GROUND) Grass over firm, blue grey mottled yellow brown and red orange slightly sandy and silty gravelly clay with frequent rootlets and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone and coal, cobbles of mudstone, carbonised mudstone and sandstone, and occasional boulders of carbonised mudstone.	0
				1.70			(MADE GROUND) Blue grey mottled red orange and white slightly clayey and silty gravel. Gravel is cobbles and boulders, angular and subangular to subrounded mudstone, carbonised mudstone, and sandstone. Pit terminated at 1.70mbgl due to very hard and very compact ground.	1
				{4.00}			Trial Pit completed at 1.70m.	2
								3
								4

General Remarks
 Dimensions: 2.88x0.66x1.70
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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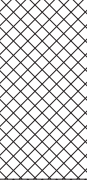
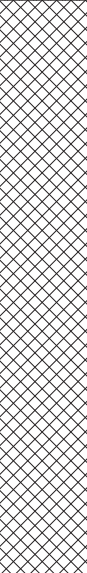
1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			TP18
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
				0.60			(MADE GROUND) Grass over soft to firm, grey brown occasionally blue grey mottled orange slightly sandy and silty gravelly clay with occasional rootlets and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone and sandstone, cobbles and boulders of mudstone, carbonised mudstone and sandstone.	0
	0.90	ES		2.50			(MADE GROUND) Blue dark grey mottled white grey and orange slightly clayey and silty gravel. Gravel is coarse, angular and subangular mudstone, carbonised mudstone and sandstone, cobbles and boulders of mudstone, carbonised mudstone and sandstone.	1
				{4.00}			Trial Pit completed at 2.50m.	2
								3
								4

General Remarks
 Dimensions: 2.99x0.72x2.50
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			TP19
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
----------------------------------	-----------------

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.50			(MADE GROUND) Grass over grey brown occasionally blue grey mottled dark grey and orange slightly sandy and silty clayey gravel with frequent rootlets, and black staining. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone, sandstone and occasional bricks, cobbles and boulders of mudstone and carbonised mudstone.	0
							(MADE GROUND) Blue dark grey mottled white grey and orange gravel. Gravel is cobbles and boulders, angular and subangular mudstone, carbonised mudstone, and occasional sandstone.	1
				2.50				2
				{4.00}			Trial Pit completed at 2.50m.	3
								4

General Remarks
 Dimensions: 2.88x0.72x2.50
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			TP20
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
----------------------------------	-----------------

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.40	ES		0.50			(MADE GROUND) Grass over firm, grey brown mottled light green and orange slightly sandy and silty gravelly clay with frequent rootlets, and black staining. Gravel is fine to coarse, angular and subangular mudstone and sandstone, and cobbles of mudstone and sandstone.	0
				1.20			(MADE GROUND) Blue dark grey mottled light grey and orange slightly clayey and silty gravel with occasional black staining. Gravel is cobbles and boulders, angular and subangular mudstone, carbonised mudstone, and occasional sandstone.	1
				2.50			(MADE GROUND) Blue grey mottled orange and white grey gravel. Gravel is cobbles and boulders, angular and subangular mudstone and carbonised mudstone.	2
				{4.00}			Trial Pit completed at 2.50m.	3
								4

General Remarks
 Dimensions: 3.42x0.68x2.50
 Excavated by JCB 3CX mechanical excavator.
 Groundwater was not encountered.
 On completion, the trial pit was backfilled with arisings.

All dimensions in metres Scale 1:25	Logged By N.M
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1.1 ENZYGO TP LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD.AGS 3_1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			WS1
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	
Client Peel Environmental Ltd			Sheet 1 of 1

Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		0.30	ES		0.65		(MADE GROUND) Grass over firm brown grey occasionally blue green mottled red orange slightly sandy gravelly clay with occasional rootlets and black staining. Gravel is fine to medium, angular and subangular mudstone, sandstone, carbonised mudstone and occasional bricks.	0	
		1.00 - 1.45	SPTLS S 21	1.00			(MADE GROUND) Grey green mottled red orange gravel with black staining. Gravel is fine to coarse, angular and subangular mudstone, sandstone and carbonised mudstone.	1	
		2.00 - 2.45	SPTLS S 26				(MADE GROUND) Medium dense to very dense blue grey mottled white grey gravel with black staining. Gravel is fine to coarse, angular and subangular mudstone and carbonised mudstone.	2	
		3.00 - 3.24	SPTLS S >50	3.24			Borehole completed at 3.24m.	3	
				{4.00}				4	

General Remarks
 EQUIPMENT: Dando Terrier rig.
 METHOD: Dynamic sampled 0.00-3.235m.
 CASING: Not used.
 REMARKS: Groundwater not encountered.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 3.00m, granular response zone 3.235-1.00m, bentonite seal 1.00-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
 Scale 1:25

Logged By
N.M

1.0.ENZYGO BH LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD AGS 3 -1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			WS2
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		0.35	ES		0.55		(MADE GROUND) Grass over grey green mottled dark grey and orange slightly sandy and silty clayey gravel with occasional rootlets and black staining. Gravel is fine to coarse, angular to subangular sandstone, mudstone, carbonised mudstone and occasional bricks.	0	
		1.00 - 1.45	SPTLS S 28				(MADE GROUND) Medium dense to very dense grey brown occasionally grey green mottled red range gravel with occasional rootlets and black staining. Gravel is fine, angular to subangular sandstone, mudstone, carbonised mudstone and occasional coal.	1	
		2.00 - 2.45	SPTLS S 10					2	
		2.60 - 2.79	SPTLS S >50		2.79			3	
				{4.00}			Borehole completed at 2.79m.	4	

General Remarks
 EQUIPMENT: Dando Terrier rig.
 METHOD: Dynamic sampled 0.00-2.79m.
 CASING: Not used.
 REMARKS: Groundwater not encountered.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 2.75m, granular response zone 2.79-0.75m, bentonite seal 0.75-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By N.M
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1.0.ENZYGO BH LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD AGS 3 -1 ENZYGO.GPJ 28/11/14



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Site Houghton Main, Barnsley			WS3
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 2
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		0.35	ES		0.55		(MADE GROUND) Grass over grey green mottled dark grey and orange slightly sandy and silty clayey gravel with occasional rootlets and black staining. Gravel is fine to medium, angular to subangular sandstone, mudstone, carbonised mudstone, occasional coal and bricks.	0	
		1.00 - 1.45	SPTLS S 28				(MADE GROUND) Medium dense to dense blue grey mottled white grey and orange occasionally locally sandy slightly clayey and silty gravel with occasional black staining. Gravel is fine to coarse, angular and subangular mudstone, occasional carbonised mudstone and sandstone.	1	
		2.00 - 2.45	SPTLS S 40					2	
		3.00 - 3.45	SPTLS S 35		3.00		(MADE GROUND) Dense to very dense grey mottled light green and orange locally slightly sandy gravel. Gravel is fine to coarse, angular and subangular mudstone, carbonised mudstone and occasional sandstone.	3	
	4.00 - 4.45	SPTLS S >50		{4.00}			Continued next sheet	4	

General Remarks
 EQUIPMENT: Dando Terrier Window Sampler.
 METHOD: Dynamic sampled 0m-4.45mbgl.
 CASING: No casing used.
 REMARKS: Groundwater not encountered.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 3.95m, granular response zone 4.45-1.00m, bentonite seal 1.00-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By N.M
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Site Houghton Main, Barnsley			WS3
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 2 of 2
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
					4.45				4
							Borehole completed at 4.45m.		5
									6
									7
					{8.00}				8

General Remarks
 EQUIPMENT: Dando Terrier Window Sampler.
 METHOD: Dynamic sampled 0m-4.45mbgl.
 CASING: No casing used.
 REMARKS: Groundwater not encountered.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 3.95m, granular response zone 4.45-1.00m, bentonite seal 1.00-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By N.M
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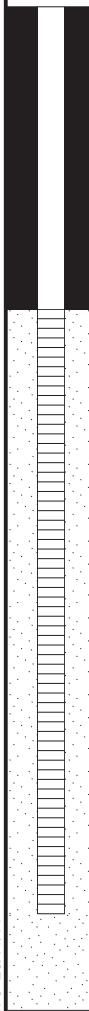
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Site
 Houghton Main, Barnsley

WS4

Job No: CRM.066.002
 Dates: Start 28-08-14, Finish 28-08-14
 Ground Level (m)
 Co-Ordinates

Client: Peel Environmental Ltd
 Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
							(MADE GROUND) Grass over blue grey mottled orange and yellow brown slightly sandy and silty clayey gravel with occasional rootlets and black staining. Gravel is fine to coarse, angular to subangular mudstone, carbonised mudstone and sandstone.	0	
		0.70	ES		0.55		(MADE GROUND) Grey brown occasionally blue grey slightly sandy clayey gravel with occasional black staining. Gravel is fine to coarse, angular to subangular mudstone, sandstone and occasional carbonised mudstone.		
		1.00 - 1.45	SPTLS S 15		0.80		(MADE GROUND) Medium dense blue grey mottled light green and orange slightly silty clayey gravel with occasional black staining. Gravel is fine to coarse, angular to subangular mudstone, carbonised mudstone and occasional sandstone.	1	
		2.00 - 2.45	SPTLS S 26		1.65		(MADE GROUND) Medium dense grey gravel. Gravel is fine to coarse, angular to subangular sandstone.	2	
		3.00 - 3.32	SPTLS S >50		2.30		(MADE GROUND) Firm to stiff, medium to high strength blue grey mottled red orange locally slightly sandy silty gravelly clay with occasional black staining. Gravel is fine to medium, angular to subangular mudstone.		
					2.50		(MADE GROUND) Medium dense to very dense blue grey mottled light green and orange slightly clayey and silty gravel. Gravel is fine to coarse, angular to subangular sandstone and mudstone with occasional carbonised mudstone.	3	
				3.32		Borehole completed at 3.32m.			
				{4.00}				4	

General Remarks

EQUIPMENT: Dando Terrier Window Sampler.
 METHOD: Dynamic sampled 0m-3.32mbgl.
 CASING: No casing used.
 REMARKS: Groundwater not encountered.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 3.00m, granular response 3.32-1.00m, bentonite seal 1.00-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
 Scale 1:25

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Site Houghton Main, Barnsley			WS5
Job No CRM.066.002	Dates Start 28-08-14 Finish 28-08-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 1
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
							(MADE GROUND) Grass over firm blue grey mottled dark grey and orange locally sandy slightly silty gravelly clay with occasional black staining. Gravel is fine to medium, angular to subangular mudstone, carbonised mudstone, sandstone and occasional bricks.	0	
		0.80	ES		0.50		(MADE GROUND) Blue grey mottled dark grey and orange locally sandy slightly silty clayey gravel with occasional black staining. Gravel is fine to coarse, angular to subangular mudstone, carbonised mudstone, and sandstone.		
		1.00 - 1.45	SPTLS S 49		0.90		(MADE GROUND) Dense to very dense, grey mottled orange locally slightly sandy gravel with black staining. Gravel is fine to coarse, angular to subangular mudstone and carbonised mudstone.	1	
		2.00 - 2.45	2.445 SPTLS		2.45		Borehole completed at 2.45m.	2	
				{4.00}				3	
								4	

General Remarks
 EQUIPMENT: Dando Terrier Window Sampler.
 METHOD: Dynamic sampled 0m-2.445mbgl.
 CASING: No casing used.
 REMARKS: Groundwater not encountered.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 2.10m, granular response zone 2.445-1.00m, bentonite seal 1.00-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By N.M
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Site Houghton Main, Barnsley			BH1
Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 1 of 10
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
							Grey opencast backfill.		0
									1
									2
									3
					{4.00}				4

Continued next sheet

General Remarks
 EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By SS
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Site Houghton Main, Barnsley			BH1
Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 2 of 10
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
									4
									5
									6
									7
					{8.00}			Continued next sheet	8

General Remarks
 EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By SS
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Site Houghton Main, Barnsley			BH1
Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 3 of 10
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
								8 9 10 11 12	
				{12.00}			Continued next sheet		

General Remarks
 EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
	23/10/14	10.50		8.70

All dimensions in metres Scale 1:25	Logged By SS
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Site Houghton Main, Barnsley			BH1
Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 4 of 10
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
								12	
								13	
								14	
								15	
					{16.00}			16	

Continued next sheet

General Remarks
 EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By SS
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Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 5 of 10
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
								16	
								17	
								18	
								19	
					{20.00}			20	

Continued next sheet

General Remarks

EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
 Scale 1:25

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Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	
Client Peel Environmental Ltd			Sheet 6 of 10

Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
								20	
								21	
								22	
								23	
					{24.00}			24	

Continued next sheet

General Remarks

EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
 Scale 1:25

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Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	
Client Peel Environmental Ltd			Sheet 7 of 10

Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description
		Depth (m)	No/Type	Results				
				{28.00}			Continued next sheet	

General Remarks
 EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
 Scale 1:25

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Site Houghton Main, Barnsley			BH1
Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	
Client Peel Environmental Ltd			Sheet 8 of 10

Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		28.70 - 30.20	C		28.70			28	
							Medium strong and strong grey and light grey fine and medium SANDSTONE. Fractures are subhorizontal, closely and medium spaced undulating rough and smooth. (180mm, 330mm, 510mm) 28.70 - 30.20 TCR 98%; SCR 87%; RQD 85%.	29	
		30.20 - 31.70	C		30.08		30.08 - 30.16 Drilling disturbed recovered as a gravelly silty clay. Gravel is angular and subangular fine and medium mudstone and siltstone. Weak dark grey MUDSTONE thinly interlaminated to very thinly interbedded with light grey SILTSTONE. Fractures are subhorizontal locally randomly orientated extremely closely to closely spaced undulating smooth locally rough. Locally non intact possible drilling induced. (15mm (NI), 75mm, 150mm) 30.20 - 30.23 Drilling disturbed recovered as a gravelly silty clay. Gravel is angular and subangular fine and medium. 30.20 - 31.70 TCR 100%; SCR 69%; RQD 57%. 30.44 - 30.50 Non intact (NI) 30.58 - 30.61 NI.	30	
		31.70 - 33.20	C		31.13		31.08 - 31.13 NI. Medium strong and strong grey and light grey fine and medium SANDSTONE. Fractures are subhorizontal medium and widely spaced planar and undulating. Locally discoloured black (organic) penetrating up to 1.5mm. (200mm, 430mm, 660mm) 31.70 - 33.20 TCR 98%; SCR 98%; RQD 90%.	31	
				{32.00}			Continued next sheet	32	

General Remarks

EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
 Scale 1:25

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Site Houghton Main, Barnsley			BH1
Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 9 of 10
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		33.20 - 34.70	C		33.10		Medium strong and strong grey, light grey with rare thin dark grey laminae fine and medium SANDSTONE. Fractures are subhorizontal to 10° closely and medium spaced planar smooth locally rough. (60mm, 200mm, 340mm) 33.20 - 34.70 TCR 94%; SCR 94%; RQD 87%.	32	
		34.70 - 36.20	C		34.70			34.70 - 35.60 Fractures are subhorizontal to 10° widely spaced planar rough. (900mm) 34.70 - 36.20 TCR 100%; SCR 100%; RQD 97%. Medium strong locally strong grey and light grey fine and medium SANDSTONE.	33
						{36.00}		35.60 - 37.95 Fractures are subhorizontal to 10° very closely and closely spaced undulating rough. (25mm (NI), 120mm, 180mm)	34
								35	
								36	

General Remarks
 EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By SS
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Job No CRM.066.002	Dates Start 22-10-14 Finish 27-10-14	Ground Level (m) Co-Ordinates	

Client Peel Environmental Ltd	Sheet 10 of 10
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		36.20 - 37.70	C				36.20 - 37.70 TCR 93%; SCR 87%; RQD 80%.	36	
		37.70 - 39.20	C		37.95		37.70 - 39.20 TCR 100%; SCR 95%; RQD 85%.	37	
					39.20		Medium strong and strong grey and light brownish grey with occasional dark grey thin laminae SANDSTONE. Fractures are subhorizontal to 10° very closely and closely spaced undulating rough. (22mm, 100mm, 200mm) 38.20 - 38.30 NI. Drilling disturbed.	38	
				{40.00}			Borehole completed at 39.20m.	39	
								40	

General Remarks
 EQUIPMENT: Dando 250 rotary rig.
 METHOD: Rotary open hole 0.00-28.70m. Air-mist rotary cored 28.70m-39.20m.
 CASING: 125mm diam. duplex casing to 28.70m.
 REMARKS: Groundwater encountered at 10.50mbgl, rose to 8.70mbgl.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 39.20m, granular response zone 39.20-8.00m, bentonite seal 8.00-6.00m, arisings from 6.00-1.00m, bentonite seal 1.00-0.20m, concrete and stopcock cover 0.20-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres Scale 1:25	Logged By SS
--	-----------------

1.0.ENZYGO BH LOG CRM.066.002 HOUGHTON MAIN.GPJ GINT STD AGS 3 -1 ENZYGO.GPJ 28/11/14

APPENDIX C – CHEMICAL TESTING

Human Health Assessment Reference Values

Determinant	Units	GAC Value						Primary Pathway
		Residential			Commercial			
Arsenic	mg/kg	32			640			Ingestion
Cadmium	mg/kg	10			230			Ingestion
Chromium	mg/kg	3000			30400			Ingestion
Chromium IV	mg/kg	4.3			35			Ingestion
Lead	mg/kg	450			590			Ingestion
Mercury	mg/kg	170			3600			Inhalation
Nickel	mg/kg	130			1800			Ingestion
Selenium	mg/kg	350			13000			Ingestion
Copper	mg/kg	2330			71700			Ingestion
Zinc	mg/kg	3750			665000			Ingestion
Cyanide	mg/kg	791			16200			Ingestion
Phenol	mg/kg	210			1100000			Ingestion
SOM	%	1	2.5	6	1	2.5	6	
Napthalene	mg/kg	1.5	3.7	8.7	200	480	1100	Inhalation
Acenaphthylene	mg/kg	170	400	850	84000	97000	100000	Dermal and ingestion
Acenaphthene	mg/kg	210	480	1000	85000	98000	100000	Ingestion
Flourene	mg/kg	160	380	780	64000	69000	71000	Ingestion
Phenanthrene	mg/kg	92	200	380	22000	22000	22000	Dermal and ingestion
Anthracene	mg/kg	2300	4900	9200	530000	540000	540000	Dermal and ingestion
Fluoranthene	mg/kg	260	460	670	23000	23000	23000	Dermal and ingestion
Pyrene	mg/kg	560	1000	1600	54000	54000	54000	Dermal and ingestion
Benzo(a)Anthracene	mg/kg	3.1	4.7	5.9	90	95	97	Dermal and ingestion
Chrysene	mg/kg	6	8	9.3	140	140	140	Dermal and ingestion
Benzo(b/k)Flouranthene	mg/kg	5.6	6.5	7	100	100	100	Dermal and ingestion
Benzo(a)Pyrene	mg/kg	0.83	0.94	1	14	14	14	Dermal and ingestion
Indeno(123-cd)Pyrene	mg/kg	3.2	3.9	4.2	60	61	62	Dermal and ingestion
Dibenzo(a,h)Anthracene	mg/kg	0.76	0.86	0.9	13	13	13	Dermal and ingestion
Benzo(ghi)Perylene	mg/kg	44	46	47	650	660	660	Dermal and ingestion
TPH C ₅ -C ₆ Aliphatic	mg/kg	30	55	110	3400	6200	13000	Inhalation
TPH C ₆ -C ₈ Aliphatic	mg/kg	73	160	370	8300	18000	42000	Inhalation
TPH C ₈ -C ₁₀ Aliphatic	mg/kg	19	46	110	2100	5100	12000	Inhalation
TPH C ₁₀ -C ₁₂ Aliphatic	mg/kg	93	230	540	10000	24000	49000	Inhalation
TPH C ₁₂ -C ₁₆ Aliphatic	mg/kg	740	1700	3000	61000	83000	91000	Inhalation
TPH C ₁₆ -C ₃₅ Aliphatic	mg/kg	45000	64000	76000	1600000	1800000	1800000	Inhalation
TPH C ₃₅ -C ₄₄ Aliphatic	mg/kg	45000	64000	76000	1600000	1800000	1800000	Ingestion
TPH C ₅ -C ₇ Aromatic	mg/kg	65	130	280	28000	49000	90000	Inhalation
TPH C ₇ -C ₈ Aromatic	mg/kg	120	270	611	59000	110000	190000	Inhalation
TPH C ₈ -C ₁₀ Aromatic	mg/kg	27	65	151	3700	8600	18000	Inhalation
TPH C ₁₀ -C ₁₂ Aromatic	mg/kg	69	160	346	36000	37000	37800	Ingestion
TPH C ₁₂ -C ₁₆ Aromatic	mg/kg	140	310	593	28000	28000	28000	Ingestion
TPH C ₁₆ -C ₂₁ Aromatic	mg/kg	250	480	770	28000	28000	28000	Ingestion
TPH C ₂₁ -C ₃₅ Aromatic	mg/kg	890	1100	1230	28000	28000	28000	Ingestion
TPH C ₃₅ -C ₄₄ Aromatic	mg/kg	890	1100	1230	28000	28000	28000	Ingestion
Benzene	mg/kg	0.08			95			Inhalation
Toluene	mg/kg	119			4400			Inhalation
Ethylbenzene	mg/kg	65			2800			Inhalation
Xylene	mg/kg	42			3200			Inhalation

Controlled Waters Assessment Reference Values

Determinant	Unit	EQS Freshwater	Uk DWS	WHO
Arsenic	ug/l	50	10	10
Boron	ug/l	2000	1000	0.3
Cadmium	ug/l	5	5	3
Chromium	ug/l	5 – 250	50	50
Lead	ug/l	4 – 250	25	10
Mercury	ug/l	1	1	1
Selenium	ug/l		10	10
Copper	ug/l	1 – 28	20000	2000
Nickel	ug/l	50 – 200	20	70
Zinc	ug/l	8 – 50	5000	3000
Sulphate	mg/l	400	250	250
PAH	ug/l		0.1	
Anthracene	ug/l	0.02		
Napthalene	ug/l	10		
Benzo(a)Pyrene	ug/l	0.03		0.01
Fluoranthene	ug/l	0.02		
Benzene	ug/l	30	1	10
Toluene	ug/l	50		
Ethylbenzene	ug/l	20		
Xylene	ug/l	30		
TPH	ug/l			
C ₅ – C ₆ Aliphatic	ug/l			15000
C ₆ – C ₈ Aliphatic	ug/l			15000
C ₈ – C ₁₀ Aliphatic	ug/l			300
C ₁₀ – C ₁₂ Aliphatic	ug/l			300
C ₁₂ – C ₁₆ Aliphatic	ug/l			300
C ₁₆ – C ₃₆ Aliphatic	ug/l			N/A
C ₆ – C ₇ Aromatic	ug/l			10
C ₇ – C ₈ Aromatic	ug/l	50		10
C ₈ – C ₁₀ Aromatic	ug/l	20		300
C ₁₀ – C ₁₂ Aromatic	ug/l			1000
C ₁₂ – C ₁₆ Aromatic	ug/l			1000
C ₁₆ – C ₂₁ Aromatic	ug/l			90
C ₂₁ – C ₃₅ Aromatic	ug/l			90

ELAB



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 14-00539

Issue: 1

Date of Issue: 29/09/2014

Contact: Richard Hamilton

Customer Details: Enzygo - Cromhall
The Granary
Woodend Lane
Cromhall
Gloucestershire

Quotation No: Q14-00007

Order No: CRM 737

Customer Reference: CRM.066.002

Date Received: 15/09/2014

Date Approved: 29/09/2014

Details: Houghton Main

Approved by:

A handwritten signature in blue ink, appearing to read 'J. Wilson', with a large flourish at the end.

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)



Sample Summary

Report No.: 14-00539

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
3509	HP01 D1 0.20	12/09/2014	15/09/2014	Silty loam	
3510	HP02 D1 0.20	12/09/2014	15/09/2014	Silty loam	



2683



Results Summary

Report No.: 14-00539

ELAB Reference	3509	3510
Customer Reference	D1	D1
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	HP01	HP02
Sample Depth (m)	0.20	0.20
Sampling Date	12/09/2014	12/09/2014

Determinand	Codes	Units	LOD		
Metals					
Arsenic	M	mg/kg	1	13.7	13.4
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	35.1	31.6
Copper	M	mg/kg	5	41.2	37.3
Lead	M	mg/kg	5	35.6	39.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	51.3	47.4
Selenium	M	mg/kg	1	< 1.0	< 1.0
Zinc	M	mg/kg	45	119	114
Inorganics					
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Miscellaneous					
Moisture Content	N	%	0.1	17.9	16.3
Stones Content	N	%	0.1	< 0.1	< 0.1
Total Organic Carbon	N	%	0.01	1.4	1.0



2683



Results Summary

Report No.: 14-00539

ELAB Reference	3509	3510
Customer Reference	D1	D1
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	HP01	HP02
Sample Depth (m)	0.20	0.20
Sampling Date	12/09/2014	12/09/2014

Determinand	Codes	Units	LOD		
Organics					
>C8-C10 BCB Soil	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 BCB Soil	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 BCB Soil	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 BCB Soil	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 BCB Soil	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 BCB Soil	N	mg/kg	1	< 1.0	< 1.0
Total (>C8-C40) BCB Soil	N	mg/kg	1	< 1.0	< 1.0
Phenols					
Phenol	M	mg/kg	1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5
Total PAH(16) Speciated	M	mg/kg	2	< 2	< 2



Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
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Results Summary

Report No.: 14-00539

Asbestos Qualitative Results

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

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
3509	0.20	HP01 D1	Silty loam	No asbestos detected
3510	0.20	HP02 D1	Silty loam	No asbestos detected



Method Summary

Report No.: 14-00539

Parameter	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil				
Hexavalent chromium	As submitted sample	16/09/2014	110	Colorimetry
Aqua regia extractable metals	Air dried sample	25/09/2014	118	ICPMS
Phenols in solids	As submitted sample	16/09/2014	121	HPLC
Polyaromatic hydrocarbons (GC-FID)	As submitted sample	16/09/2014	133	GC-FID
Total cyanide	As submitted sample	17/09/2014	204	Colorimetry
Total organic carbon/Total sulphur	Air dried sample	26/09/2014	210	IR
Basic carbon banding in soil	As submitted sample	16/09/2014	218	GC-FID
Asbestos identification	As submitted sample	29/09/2014	PMAN	Microscopy



Report Information

Report No.: 14-00539

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/e	not evaluated
<	means "less than"
>	means "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

ELAB



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 14-00421

Issue: 1

Date of Issue: 18/09/2014

Contact: Richard Hamilton

Customer Details: Enzygo - Cromhall
The Granary
Woodend Lane
Cromhall
Gloucestershire

Quotation No: Q14-00007

Order No: CRM 712

Customer Reference: CRM.066.002

Date Received: 02/09/2014

Date Approved: 18/09/2014

Details: Houghton Main

Approved by:

A handwritten signature in blue ink, appearing to read 'J. Wilson', with a large flourish at the end.

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)



Sample Summary

Report No.: 14-00421

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
2721	TP1 0.40	26/08/2014	05/09/2014	Silty loam	g
2722	TP2 0.25	26/08/2014	05/09/2014	Silty loam	
2723	TP3 0.80	27/08/2014	05/09/2014	Silty clayey loam	
2724	TP4 0.50	27/08/2014	05/09/2014	Silty loam	
2725	TP5 0.30	26/08/2014	05/09/2014	Silty loam	g
2726	TP6 0.45	27/08/2014	05/09/2014	Silty loam	
2727	TP7 0.60	27/08/2014	05/09/2014	Silty loam	
2728	TP8 1.00	26/08/2014	05/09/2014	Clayey loam	
2729	TP9 0.30	27/08/2014	05/09/2014	Silty loam	
2730	TP10 0.90	26/08/2014	05/09/2014	Silty loam	
2731	TP11 0.50	27/08/2014	05/09/2014	Silty loam	
2732	TP12 0.70	27/08/2014	05/09/2014	Silty loam	
2733	TP13 0.20	27/08/2014	05/09/2014	Silty clayey loam	
2734	TP14 0.75	27/08/2014	05/09/2014		
2735	TP15 0.40	27/08/2014	05/09/2014	Silty loam	
2736	TP16 0.50	28/08/2014	05/09/2014	Silty loam	
2737	TP17 0.55	28/08/2014	05/09/2014	Silty loam	
2738	TP18 0.90	28/08/2014	05/09/2014	Silty loam	
2739	TP19 0.50	28/08/2014	05/09/2014		
2740	TP19 0.75	27/08/2014	05/09/2014		
2741	TP20 0.40	28/08/2014	05/09/2014	Silty clayey loam	
2742	WS1 0.30	28/08/2014	05/09/2014	Silty loam	
2743	WS2 0.35	28/08/2014	05/09/2014	Silty loam	g
2744	WS3 0.35	28/08/2014	05/09/2014	Silty loam	
2745	WS4 0.70	28/08/2014	05/09/2014	Silty clayey loam	
2746	WS5 0.80	28/08/2014	05/09/2014	Silty loam	
2747	WS5@0.50, TP19@0.75 0.50 -	28/08/2014	05/09/2014	Silty loam	g



Results Summary

Report No.: 14-00421

ELAB Reference	2721	2722	2723	2724	2725	2726	2727
Customer Reference							
Sample ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP1	TP2	TP3	TP4	TP5	TP6	TP7
Sample Depth (m)	0.40	0.25	0.80	0.50	0.30	0.45	0.60
Sampling Date	26/08/2014	26/08/2014	27/08/2014	27/08/2014	26/08/2014	27/08/2014	27/08/2014

Determinand	Codes	Units	LOD							
Metals										
Arsenic	M	mg/kg	1	20.2	12.7	17.1	13.9	10.9	11.6	11.5
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	36.7	37.0	42.9	40.0	39.7	39.4	43.8
Copper	M	mg/kg	5	37.3	36.2	41.3	36.7	39.7	39.9	45.6
Lead	M	mg/kg	5	27.6	24.1	27.0	23.7	25.2	23.6	26.6
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	44.9	47.2	58.9	46.0	49.3	47.7	54.5
Selenium	M	mg/kg	1	0.8	0.8	0.7	0.7	0.9	0.9	0.9
Zinc	M	mg/kg	45	105	111	118	105	118	116	131
Inorganics										
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0
Miscellaneous										
Moisture Content	N	%	0.1	15.8	14.0	12.4	17.4	16.7	15.1	11.7
Stones Content	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Organic Carbon	N	%	0.01	0.6	0.6	0.9	0.8	0.9	0.8	1.1

Results Summary

Report No.: 14-00421

				ELAB Reference	2721	2722	2723	2724	2725	2726	2727
				Customer Reference							
				Sample ID							
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP1	TP2	TP3	TP4	TP5	TP6	TP7
				Sample Depth (m)	0.40	0.25	0.80	0.50	0.30	0.45	0.60
				Sampling Date	26/08/2014	26/08/2014	27/08/2014	27/08/2014	26/08/2014	27/08/2014	27/08/2014
Determinand	Codes	Units	LOD								
Organics											
>C8-C10 BCB Soil	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 BCB Soil	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 BCB Soil	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 BCB Soil	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 BCB Soil	N	mg/kg	1	n/t	1.8	1.2	< 1.0	n/t	< 1.0	< 1.0	3.5
>C35-C40 BCB Soil	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Total (>C8-C40) BCB Soil	N	mg/kg	1	n/t	1.8	1.2	< 1.0	n/t	< 1.0	< 1.0	3.5
Phenols											
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons											
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH(16) Speciated	M	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
BTEX											
Benzene	M	ug/kg	10	g < 10.0	n/t	n/t	n/t	g < 10.0	n/t	n/t	n/t
Toluene	M	ug/kg	10	g < 10.0	n/t	n/t	n/t	g < 10.0	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	g < 10.0	n/t	n/t	n/t	g < 10.0	n/t	n/t	n/t
Xylenes	M	ug/kg	10	g < 10.0	n/t	n/t	n/t	g < 10.0	n/t	n/t	n/t
TPH CWG											
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	n/t	n/t	n/t	< 0.01	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	n/t	n/t	n/t	< 0.01	n/t	n/t	n/t
>C8-C10 Aliphatic Soil	N	mg/kg	1	1.6	n/t	n/t	n/t	1.7	n/t	n/t	n/t
>C10-C12 Aliphatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C12-C16 Aliphatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C16-C21 Aliphatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C21-C35 Aliphatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C35-C40 Aliphatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	n/t	n/t	n/t	< 0.01	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	n/t	n/t	n/t	< 0.01	n/t	n/t	n/t
>C8-C10 Aromatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C10-C12 Aromatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C12-C16 Aromatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C16-C21 Aromatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C21-C35 Aromatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t
>C35-C40 Aromatic Soil	N	mg/kg	1	< 1.0	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t



Results Summary

Report No.: 14-00421

ELAB Reference	2721	2722	2723	2724	2725	2726	2727
Customer Reference							
Sample ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP1	TP2	TP3	TP4	TP5	TP6	TP7
Sample Depth (m)	0.40	0.25	0.80	0.50	0.30	0.45	0.60
Sampling Date	26/08/2014	26/08/2014	27/08/2014	27/08/2014	26/08/2014	27/08/2014	27/08/2014

Determinand	Codes	Units	LOD							
Total (>C8-C40) Ali/Aro Soil	N	mg/kg	1	1.6	n/t	n/t	n/t	1.7	n/t	n/t

Results Summary

Report No.: 14-00421

				ELAB Reference	2728	2729	2730	2731	2732	2733	2735
				Customer Reference							
				Sample ID							
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP8	TP9	TP10	TP11	TP12	TP13	TP15
				Sample Depth (m)	1.00	0.30	0.90	0.50	0.70	0.20	0.40
				Sampling Date	26/08/2014	27/08/2014	26/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014
Determinand	Codes	Units	LOD								
Metals											
Arsenic	M	mg/kg	1	8.4	100	11.1	11.8	13.5	14.8	13.2	
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Chromium	M	mg/kg	5	39.8	30.0	28.7	39.4	31.5	39.1	29.0	
Copper	M	mg/kg	5	43.9	40.6	30.0	38.6	31.5	41.8	32.8	
Lead	M	mg/kg	5	23.4	47.6	22.9	25.1	22.0	27.0	39.5	
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Nickel	M	mg/kg	5	60.6	34.6	39.3	49.5	40.8	51.3	27.7	
Selenium	M	mg/kg	1	0.8	2.7	0.7	0.8	0.9	0.9	0.8	
Zinc	M	mg/kg	45	126	64.9	91.6	116	100	122	94.1	
Inorganics											
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	
Total Cyanide	M	mg/kg	1	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	
Miscellaneous											
Moisture Content	N	%	0.1	8.6	22.9	12.2	11.4	14.6	20.4	11.6	
Stones Content	N	%	0.1	< 0.1	< 0.1	10.8	< 0.1	< 0.1	< 0.1	6.8	
Total Organic Carbon	N	%	0.01	0.6	3.9	1.1	0.9	1.2	0.8	1.5	

Results Summary

Report No.: 14-00421

				ELAB Reference	2728	2729	2730	2731	2732	2733	2735
				Customer Reference							
				Sample ID							
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP8	TP9	TP10	TP11	TP12	TP13	TP15
				Sample Depth (m)	1.00	0.30	0.90	0.50	0.70	0.20	0.40
				Sampling Date	26/08/2014	27/08/2014	26/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014
Determinand	Codes	Units	LOD								
Organics											
>C8-C10 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.1
>C35-C40 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	2.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C8-C40) BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	2.0	< 1.0	< 1.0	< 1.0	1.1
Phenols											
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons											
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH(16) Speciated	M	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	4
BTEX											
Benzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
TPH CWG											
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t



Results Summary

Report No.: 14-00421

ELAB Reference	2728	2729	2730	2731	2732	2733	2735
Customer Reference							
Sample ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP8	TP9	TP10	TP11	TP12	TP13	TP15
Sample Depth (m)	1.00	0.30	0.90	0.50	0.70	0.20	0.40
Sampling Date	26/08/2014	27/08/2014	26/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014

Determinand	Codes	Units	LOD						
Total (>C8-C40) Ali/Aro Soil	N	mg/kg	1	n/t	n/t	n/t	n/t	n/t	n/t



Results Summary

Report No.: 14-00421

ELAB Reference	2736	2737	2738	2741	2742	2743	2744
Customer Reference							
Sample ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP16	TP17	TP18	TP20	WS1	WS2	WS3
Sample Depth (m)	0.50	0.55	0.90	0.40	0.30	0.35	0.35
Sampling Date	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014

Determinand	Codes	Units	LOD							
Metals										
Arsenic	M	mg/kg	1	12.0	18.1	26.0	31.6	16.5	14.0	13.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	33.3	33.2	26.6	30.8	35.3	27.8	34.1
Copper	M	mg/kg	5	36.9	43.2	45.8	63.1	43.2	36.5	36.5
Lead	M	mg/kg	5	25.2	25.0	35.0	50.9	29.6	25.5	24.5
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	43.3	38.4	44.8	40.6	52.8	39.8	47.8
Selenium	M	mg/kg	1	1.0	0.9	1.4	1.8	1.2	0.9	0.9
Zinc	M	mg/kg	45	106	90.4	95.5	96.5	124	92.2	111
Inorganics										
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0	*^ < 1.0
Miscellaneous										
Moisture Content	N	%	0.1	13.0	16.0	9.5	20.7	13.7	14.2	11.3
Stones Content	N	%	0.1	6.7	11.0	22.8	< 0.1	< 0.1	5.4	8.5
Total Organic Carbon	N	%	0.01	1.1	3.3	0.9	1.3	1.0	1.3	0.9

Results Summary

Report No.: 14-00421

				ELAB Reference	2736	2737	2738	2741	2742	2743	2744
				Customer Reference							
				Sample ID							
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP16	TP17	TP18	TP20	WS1	WS2	WS3
				Sample Depth (m)	0.50	0.55	0.90	0.40	0.30	0.35	0.35
				Sampling Date	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014
Determinand	Codes	Units	LOD								
Organics											
>C8-C10 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
>C10-C12 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
>C12-C16 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
>C16-C21 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
>C21-C35 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
>C35-C40 BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
Total (>C8-C40) BCB Soil	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
Phenols											
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons											
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH(16) Speciated	M	mg/kg	2	< 2	< 2	< 2	2	< 2	< 2	< 2	< 2
BTEX											
Benzene	M	ug/kg	10	n/t	n/t	n/t	< 10.0	n/t	n/t	n/t	< 10.0
Toluene	M	ug/kg	10	n/t	n/t	n/t	12.4	n/t	n/t	n/t	< 10.0
Ethylbenzene	M	ug/kg	10	n/t	n/t	n/t	< 10.0	n/t	n/t	n/t	< 10.0
Xylenes	M	ug/kg	10	n/t	n/t	n/t	< 10.0	n/t	n/t	n/t	< 10.0
TPH CWG											
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	< 0.01	n/t	n/t	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	n/t	n/t	< 0.01	n/t	n/t	n/t	< 0.01
>C8-C10 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	1.7	n/t	n/t	n/t	1.4
>C10-C12 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C12-C16 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C16-C21 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C21-C35 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C35-C40 Aliphatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	< 0.01	n/t	n/t	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	n/t	n/t	0.01	n/t	n/t	n/t	< 0.01
>C8-C10 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C10-C12 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C12-C16 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C16-C21 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C21-C35 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0
>C35-C40 Aromatic Soil	N	mg/kg	1	n/t	n/t	n/t	< 1.0	n/t	n/t	n/t	< 1.0



Results Summary

Report No.: 14-00421

ELAB Reference	2736	2737	2738	2741	2742	2743	2744
Customer Reference							
Sample ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP16	TP17	TP18	TP20	WS1	WS2	WS3
Sample Depth (m)	0.50	0.55	0.90	0.40	0.30	0.35	0.35
Sampling Date	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014	28/08/2014

Determinand	Codes	Units	LOD							
Total (>C8-C40) Ali/Aro Soil	N	mg/kg	1	n/t	n/t	n/t	1.7	n/t	n/t	1.4



Results Summary

Report No.: 14-00421

ELAB Reference	2746	2747
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS5	TP19@0.50, TP19@0.75
Sample Depth (m)	0.80	0.50 - 0.75
Sampling Date	28/08/2014	28/08/2014

Determinand	Codes	Units	LOD		
Metals					
Arsenic	M	mg/kg	1	12.5	20.3
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	36.9	41.9
Copper	M	mg/kg	5	48.6	48.1
Lead	M	mg/kg	5	30.2	27.3
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	60.9	55.4
Selenium	M	mg/kg	1	1.5	1.2
Zinc	M	mg/kg	45	136	126
Inorganics					
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	*^ < 1.0	*^ < 1.0
Miscellaneous					
Moisture Content	N	%	0.1	13.9	12.5
Stones Content	N	%	0.1	< 0.1	< 0.1
Total Organic Carbon	N	%	0.01	0.6	1.3

Results Summary

Report No.: 14-00421

ELAB Reference	2746	2747
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS5	TP19@0.50, TP19@0.75
Sample Depth (m)	0.80	0.50 - 0.75
Sampling Date	28/08/2014	28/08/2014

Determinand	Codes	Units	LOD		
Organics					
>C8-C10 BCB Soil	N	mg/kg	1	< 1.0	n/t
>C10-C12 BCB Soil	N	mg/kg	1	< 1.0	n/t
>C12-C16 BCB Soil	N	mg/kg	1	< 1.0	n/t
>C16-C21 BCB Soil	N	mg/kg	1	< 1.0	n/t
>C21-C35 BCB Soil	N	mg/kg	1	< 1.0	n/t
>C35-C40 BCB Soil	N	mg/kg	1	< 1.0	n/t
Total (>C8-C40) BCB Soil	N	mg/kg	1	< 1.0	n/t
Phenols					
Phenol	M	mg/kg	1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1
Trimethylphenol	M	mg/kg	1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5
Total PAH(16) Speciated	M	mg/kg	2	< 2	< 2
BTEX					
Benzene	M	ug/kg	10	n/t	< 10.0
Toluene	M	ug/kg	10	n/t	< 10.0
Ethylbenzene	M	ug/kg	10	n/t	< 10.0
Xylenes	M	ug/kg	10	n/t	< 10.0
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	n/t	< 0.01
>C8-C10 Aliphatic Soil	N	mg/kg	1	n/t	1.1
>C10-C12 Aliphatic Soil	N	mg/kg	1	n/t	< 1.0
>C12-C16 Aliphatic Soil	N	mg/kg	1	n/t	< 1.0
>C16-C21 Aliphatic Soil	N	mg/kg	1	n/t	< 1.0
>C21-C35 Aliphatic Soil	N	mg/kg	1	n/t	< 1.0
>C35-C40 Aliphatic Soil	N	mg/kg	1	n/t	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	n/t	< 0.01
>C8-C10 Aromatic Soil	N	mg/kg	1	n/t	< 1.0
>C10-C12 Aromatic Soil	N	mg/kg	1	n/t	< 1.0
>C12-C16 Aromatic Soil	N	mg/kg	1	n/t	< 1.0
>C16-C21 Aromatic Soil	N	mg/kg	1	n/t	< 1.0
>C21-C35 Aromatic Soil	N	mg/kg	1	n/t	< 1.0
>C35-C40 Aromatic Soil	N	mg/kg	1	n/t	< 1.0



Results Summary

Report No.: 14-00421

ELAB Reference	2746	2747
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS5	TP19@0.50, TP19@0.75
Sample Depth (m)	0.80	0.50 - 0.75
Sampling Date	28/08/2014	28/08/2014

Determinand	Codes	Units	LOD		
Total (>C8-C40) Ali/Aro Soil	N	mg/kg	1	n/t	1.1

Results Summary

Report No.: 14-00421

ELAB Reference	2723	2730	2745
Customer Reference			
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	TP3	TP10	WS4
Sample Depth (m)	0.80	0.90	0.70
Sampling Date	27/08/2014	26/08/2014	28/08/2014

Determinand	Codes	Units	LOD			
VOC						
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Heptane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	10.1	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
cis-1,2-dichloroethene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Dichloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dichloroethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Dibromoethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
o-cymene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2,3-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2,4-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0	< 10.0

Results Summary

Report No.: 14-00421

ELAB Reference	2723	2730	2745
Customer Reference			
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	TP3	TP10	WS4
Sample Depth (m)	0.80	0.90	0.70
Sampling Date	27/08/2014	26/08/2014	28/08/2014

Determinand	Codes	Units	LOD			
SVOC						
Phenol	N	mg/kg	0.01	0.03	0.02	< 0.01
Aniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Bis(2-chloroethyl)ether	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2-Chlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1,3-Dichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1,4-Dichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Benzyl Alcohol	N	mg/kg	0.01	< 0.01	< 0.01	0.05
1,2-Dichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2-Methylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Bis(2-chloroisopropyl)ether	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
3 and 4-methylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
N-Nitrosodi-n-propylamine	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Hexachloroethane	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Nitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Isophorone	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2-Nitrophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2,4-Dimethylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Bis(2-chloroethoxy)methane	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1,3,5-Trichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Naphthalene	N	mg/kg	0.01	0.09	0.02	0.02
3-Chloroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Hexachloro-1,3-butadiene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
4-Chloro-3-methylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2-Methylnaphthalene	N	mg/kg	0.01	0.12	0.05	0.07
1-Methylnaphthalene	N	mg/kg	0.01	0.15	0.07	0.08
Hexachlorocyclopentadiene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2,4,6-Trichlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2,4,5-Trichlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1-Chloronaphthalene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2-Nitroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1,4-Dinitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Dimethyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1,3-dinitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2,6-dinitrotoluene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1,2-Dinitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
3-Nitroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
4-nitrophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Dibenzofuran	N	mg/kg	0.01	0.03	0.01	< 0.01
2,3,5,6-Tetrachlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
2,3,4,6-Tetrachlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Diethyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1-chloro-4-phenoxybenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Fluorene	N	mg/kg	0.01	0.02	0.01	0.01
4-Nitroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Dinitro-o-cresol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Diphenylamine	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Azobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
1-bromo-4-phenoxybenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Pentachlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	N	mg/kg	0.01	0.10	0.06	0.07
Anthracene	N	mg/kg	0.01	0.03	< 0.01	< 0.01
Carbazole	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Dibutyl phthalate	N	mg/kg	0.01	0.01	< 0.01	0.01
Fluoranthene	N	mg/kg	0.01	0.03	0.02	0.02
Pyrene	N	mg/kg	0.01	0.02	0.02	0.02
Butyl benzyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Bis-2-ethylhexyladipate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Chrysene	N	mg/kg	0.01	0.02	< 0.01	< 0.01
Bis(2-ethylhexyl)phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-CD)pyrene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Dibenz(ah)anthracene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01



Results Summary

Report No.: 14-00421

ELAB Reference	2725	2743	2747
Customer Reference			
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	TP5	WS2	TP19@0.50, TP19@0.75
Sample Depth (m)	0.30	0.35	0.50 - 0.75
Sampling Date	26/08/2014	28/08/2014	28/08/2014

Determinand	Codes	Units	LOD			
Metals						
Arsenic	N	ug/l	5	< 5	< 5	< 5
Cadmium	N	ug/l	1	< 1	< 1	< 1
Calcium	N	ug/l	100	1800	n/t	n/t
Chromium	N	ug/l	5	< 5	< 5	< 5
Copper	N	ug/l	5	< 5	< 5	< 5
Lead	N	ug/l	5	< 5	< 5	< 5
Magnesium	N	ug/l	100	2020	n/t	n/t
Mercury	N	ug/l	0.1	< 0.1	< 0.1	< 0.1
Nickel	N	ug/l	5	< 5	< 5	< 5
Selenium	N	ug/l	5	< 5	< 5	< 5
Zinc	N	ug/l	5	< 5	< 5	< 5
Inorganics						
Hexavalent chromium	N	ug/l	100	< 100	< 100	< 100
Total Cyanide	N	ug/l	20	< 20	< 20	< 20
Total hardness (mg/l CaCO3)	N	mg/l	1	14		
Miscellaneous						
Dissolved Organic Carbon	N	mg/l	0.9	9	7	20
Organics						
>C8-C10 BCB Leachate	N	ug/L	5	g < 5.0	g < 5.0	g < 5.0
>C10-C12 BCB Leachate	N	ug/L	5	g < 5.0	g < 5.0	g < 5.0
>C12-C16 BCB Leachate	N	ug/L	5	g < 5.0	g < 5.0	g < 5.0
>C16-C21 BCB Leachate	N	ug/L	5	g < 5.0	g < 5.0	g < 5.0
>C21-C35 BCB Leachate	N	ug/L	5	g < 5.0	g < 5.0	g < 5.0
>C35-C40 BCB Leachate	N	ug/L	5	g < 5.0	g < 5.0	g < 5.0
Total (>C8-C40) BCB Leachate	N	ug/L	5	g 19.2	g 5.2	g < 5.0
Phenols						
Total Phenols	N	mg/L	1	27	< 1	< 1
Polyaromatic hydrocarbons						
Naphthalene Leachate GCMS	N	ug/L	0.01	0.23	0.28	0.21
Acenaphthylene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Acenaphthene Leachate GCMS	N	ug/L	0.01	0.02	< 0.01	0.02
Fluorene Leachate GCMS	N	ug/L	0.01	0.01	0.02	0.02
Phenanthrene Leachate GCMS	N	ug/L	0.01	0.04	0.05	0.06
Anthracene Leachate GCMS	N	ug/L	0.01	0.01	< 0.01	< 0.01
Fluoranthene Leachate GCMS	N	ug/L	0.01	0.02	0.02	0.02
Pyrene Leachate GCMS	N	ug/L	0.01	0.02	< 0.01	0.02
Benzo (a) anthracene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Chrysene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Benzo (b) fluoranthene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Benzo (k) fluoranthene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Benzo (a) pyrene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Indeno (1,2,3-cd) pyrene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene Leachate GCMS	N	ug/L	0.01	< 0.01	< 0.01	< 0.01
Total PAH(16) Speciated Leachate GCMS	N	ug/L	0.01	0.36	0.38	0.37



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Results Summary

Report No.: 14-00421

Asbestos Qualitative Results

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

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
2721	0.40	TP1	Silty loam	No asbestos detected
2722	0.25	TP2	Silty loam	No asbestos detected
2723	0.80	TP3	Silty clayey loam	No asbestos detected
2724	0.50	TP4	Silty loam	No asbestos detected
2725	0.30	TP5	Silty loam	No asbestos detected
2726	0.45	TP6	Silty loam	No asbestos detected
2727	0.60	TP7	Silty loam	No asbestos detected
2728	1.00	TP8	Clayey loam	No asbestos detected
2729	0.30	TP9	Silty loam	No asbestos detected
2730	0.90	TP10	Silty loam	No asbestos detected
2731	0.50	TP11	Silty loam	No asbestos detected
2732	0.70	TP12	Silty loam	No asbestos detected
2733	0.20	TP13	Silty clayey loam	No asbestos detected
2735	0.40	TP15	Silty loam	No asbestos detected
2736	0.50	TP16	Silty loam	No asbestos detected
2737	0.55	TP17	Silty loam	No asbestos detected
2738	0.90	TP18	Silty loam	No asbestos detected
2741	0.40	TP20	Silty clayey loam	No asbestos detected
2742	0.30	WS1	Silty loam	No asbestos detected
2743	0.35	WS2	Silty loam	No asbestos detected
2744	0.35	WS3	Silty loam	No asbestos detected
2746	0.80	WS5	Silty loam	No asbestos detected
2747	0.50 - 0.75	TP19@0.50, TP19@	Silty loam	No asbestos detected

Method Summary

Report No.: 14-00421

Parameter	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil				
BTEX in solids	As submitted sample	10/09/2014		GC-MS
Basic carbon banding in leachate		15/09/2014		GC-FID
Carbon in leachates		18/09/2014		IR
Cyanide (L) in solids in leachates		15/09/2014		Colorimetry
Metals by ICP in leachates		18/09/2014		ICPMS
Phenols in leachates		15/09/2014		HPLC
Hexavalent chromium	As submitted sample	09/09/2014	110	Colorimetry
Aqua regia extractable metals	Air dried sample	15/09/2014	118	ICPMS
Phenols in solids	As submitted sample	09/09/2014	121	HPLC
Polyaromatic hydrocarbons (GC-FID)	As submitted sample	08/09/2014	133	GC-FID
PAHs and/or PCBs in leachates		12/09/2014	135	GC-MS
SVOC in solids	As submitted sample	08/09/2014	167	GC-MS
VOC in solids	As submitted sample	08/09/2014	181	GC-MS
Total cyanide	As submitted sample	10/09/2014	204	Colorimetry
Total organic carbon/Total sulphur	Air dried sample	15/09/2014	210	IR
Aliphatic hydrocarbons in soil	As submitted sample	08/09/2014	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	As submitted sample	10/09/2014	214	GC-FID
Aromatic hydrocarbons in soil	As submitted sample	08/09/2014	214	GC-FID
Low range Aliphatic hydrocarbons soil	As submitted sample	10/09/2014	214	GC-MS
Low range Aromatic hydrocarbons soil	As submitted sample	10/09/2014	214	GC-MS
Basic carbon banding in soil	As submitted sample	08/09/2014	218	GC-FID
Asbestos identification	As submitted sample	16/09/2014	PMAN	Microscopy



Report Information

Report No.: 14-00421

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/e	not evaluated
<	means "less than"
>	means "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage



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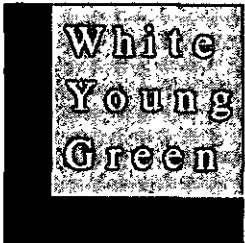
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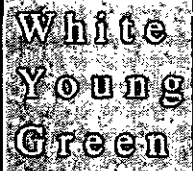
White
Young
Green

**Geo-Environmental Site Investigation
Factual and Interpretative Report**

Houghton Main Business Park, Grimethorpe

for

William Saunders Partnership



Geo-Environmental Site Investigation Factual and Interpretative Report

Houghton Main Business Park, Grimethorpe

for

William Saunders Partnership

WHITE YOUNG GREEN ENVIRONMENTAL LIMITED			
Reference: -A042741 Geo-Environmental Investigation			
Issue	Prepared by	Checked by	Verified by
1	DRAFT		
1a	Amend DRAFT		
2	Final		
	C Arnott	D Howes	Simon Croxford
	Senior Engineering Geologist	Associate	Associate Director
O:\Engineer\Projects E5001 onwards\A042741 - Grimethorpe\F&I Report.doc			
White Young Green Environmental Limited, Newstead Court, Little Oak Drive, Sherwood Business Park, Annesley, Nottinghamshire, NG15 0DR. Telephone: 01623 684550 Facsimile: 01623 684551 E-Mail: environment.nottingham@wyg.com			

This is a controlled copy

EXECUTIVE SUMMARY	
Proposed Development	It is proposed that a number of industrial / commercial units varying in size from 10,000ft ² to 1,000ft ² be built on the site along with associated parking areas and access roads.
Previous Ground Investigations and Reports	<p>Extracts of compaction certification report by Babbie, Desk Study by WSP and Opencast completion drawings from UK Coal were provided by WSP prior to the start of fieldwork.</p> <p>Signs of previous investigations are present on site including a number of raised and flush borehole covers. These are presumed to be associated with the post-compaction monitoring undertaken by Babbie as part of their Compaction Certification</p>
Site Conditions	<p>The northern boundary of the site is on the outside of disused railway which bends in a 'U' shape, the site is bounded to the east by Park Spring Road, to the west by a wire and post fence and to the south by a access roundabout and fencing for the adjacent energy plant site.</p> <p>The site is predominantly flat with an elongated bund, rising to 3m in height in places, which follows the line of the northern boundary. There is a small round bund within the site approximately 2-3m in height and the site is between 0.5m and 3m higher than the level of the adjacent Park Spring Road.</p> <p>The site predominantly lies in an area which used to form part of Houghton Main Colliery. To this ends previous land uses include railway sidings to serve the colliery, as well as being part of an opencast coal mine</p>
Geo-Environmental Assessment	<p>Due to elevated concentrations of carbon dioxide, a site Characteristic Gas Situation of 2, low hazard potential, is assessed. Basic gas protection measures, for example a suspended floor slab and membrane providing an aggregate protection score of 2 (Ref. BS8485), will be required for Commercial development.</p> <p>No potential for sulphate attack of concrete has been identified.</p> <p>No indication of conditions unsuitable for plant growth have been identified.</p> <p>No significant contamination has been identified. Risk to development workers is considered low, though due to the potential for hazardous ground gases, controls will be required before entry into excavations.</p> <p>Leachability testing has indicated a low risk of pollution of controlled waters.</p>
Geotechnical Assessment	<p>The majority of California Bearing test results fell between 3 and 11%, although five of the CBR values were below 5%. It is likely that the CBR values at the base level of pavement construction (assumed to be around 0.5mbgl) will be adequate for pavement design, if local soft spots are identified during construction works sub base depths can be locally extended to competent strata.</p> <p>The mean infiltration rate using the BRE 2007 approach to soakaway tests was 1.99E-05m.s⁻¹, if the result from the failed soakaway test is excluded then the mean infiltration rate can be taken to be 2.51E-05 m.s⁻¹</p> <p>Atterberg Limits testing undertaken on materials from the site indicated that materials were typically CLAY's of intermediate plasticity</p> <p>The results of the water soluble sulphate tests all indicated a concrete class DS-1 to be sufficient. The total potential sulphate value, calculated using the total sulphur solid result, indicated that a concrete class DS-3 would be required.</p>

	<p>The monitored groundwater levels on site to be concurrent with the regional water level within shallow mineworkings as monitored by The Coal Authority at the Dearne Valley borehole. The water level within the opencast backfill on the site can therefore be said to have recovered.</p> <p>Geophysical Resistivity and Seismic surveys have been interpreted and indicate the locations of the opencast high wall along eleven separate survey lines within the site.</p>
<p>Recommendations</p>	<p>A mean infiltration rate of $1.99E-05m.s^{-1}$ was calculated from on site Soakaway tests. Calculations for Soakaway design should take into consideration variations in permeability measured across the site.</p> <p>It is our opinion that in order to construct any development on the site that ground improvement techniques are utilised to improve the bearing capacity and minimise the potential for ongoing settlement.</p> <p>There are several options for ground treatment that could be utilised across the site. These include dynamic compaction with the industrial units constructed on raft foundations or the founding of the industrial units on vibro stone columns.</p> <p>The nature of any ground improvement should be confirmed after discussions with a suitable ground improvement contractor.</p> <p>To limit potential for differential settlement across the highwall it is important to ensure that building foundations are not constructed across the zone of influence of this interface. Layouts should be amended to account for this.</p>
<p><i>This sheet is intended as a summary of the assessment of the site in relation to ground contamination and geotechnical conditions. It does not provide a definitive engineering analysis.</i></p>	

Geo-Environmental Site Investigation Factual and Interpretative Report

Houghton Main Business Park, Grimethorpe

for

William Saunders Partnership

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Appendix A	Report Conditions
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Appendix C	Geochemical Laboratory Reports
Appendix D	Contamination Assessment Criteria
Appendix E	California Bearing Ratio Test Results
Appendix F	Geotechnical Laboratory Reports
Appendix G	Concrete Classification Summary Table
Appendix H	APEX Geoservices (UK) Ltd Geophysical Survey Report
Appendix I	Gas and Groundwater Monitoring Data

1.0 INTRODUCTION

1.1 Instruction

White Young Green Environmental Limited (WYGE) were commissioned by William Saunders Partnership (WSP) on behalf of Strategic Sites Ltd to undertake a site investigation for the site known as Houghton Main Business Park, Grimethorpe.

The scope of the investigation to be undertaken was designed by WSP and outlined in a letter dated 3rd January 2008 in which WYGE were invited to provide a quotation for carrying out the specified works.

Further site investigation was proposed by WYGE on the 16th April 2008 the scope of which is described below in Section 1.3.

1.2 Project Description

It is proposed that a number of industrial / commercial units varying in size from 10,000ft² to 1,000ft² be built on the site along with associated parking areas and access roads.

1.3 Scope of Services

The objectives of the investigation were:

- To confirm the location of the opencast highwall.
- To ascertain shallow ground conditions and provide samples for chemical and geotechnical testing.
- To ascertain deeper ground conditions providing samples for geotechnical testing and provide installations for gas and groundwater monitoring.
- To validate backfill compaction.
- To ascertain infiltration rates to assess suitability of soakaway design.
- To provide a full topographic survey of the site.

The scope of the fieldwork programme included:

- The excavation of 16No. trial pits.
- The drilling of 5No. cable percussive boreholes.
- The drilling of 15No. dynamic probe holes.
- The undertaking of 10No. in-situ California Bearing Ratio (CBR) tests.
- The undertaking of 5No. 2D Resistivity Imaging Profiles & 4No. Seismic Refraction Profiles

A further Geophysical investigation was carried out on the 3rd April 2008 and comprised the undertaking of 3No. 2D Resistivity Imaging Profiles & 3No. Seismic Refraction Profiles

Due to the complexities of the rockhead profile across the site additional works were carried out on the site to fully ascertain the extent of the cuttings, highwall and backfill. These works were carried out on the 1st and 2nd May and included the following:

- The excavation of 3No. trial trenches.
- The drilling of 14No. Rotary Open Holes.
- The Undertaking of 4No. 2D Resistivity Imaging Profiles & 4No. Seismic Refraction Profiles

1.4 Terms and Conditions

Attention is drawn to the report conditions, included in Appendix A, and the terms and conditions of the engagement.

2.0 SITE DESCRIPTION

2.1 Site Locality

The site area is approximately 9.26 acres (3.75 hectares) in total and can be located by National Grid Reference: 441660, 406420. The development site is located Off Park Spring Road to the North East of Barnsley, to the far West of Doncaster and to the South of Wakefield/Pontefract.

In relation to the local road network, the site provides easy access to the M1 (junctions 37 or 38) and to the A1(M) (junctions 37 or 38) via the A635, A628, and A637.

2.2 Site History

A detailed site history is presented in the Desk Study report by Wm. Saunders Partnership LLP

The site predominantly lies in an area which used to form part of Houghton Main Colliery. To this end previous land uses include railway sidings to serve the colliery, as well as being part of an opencast coal mine.

The colliery operated from the late 1800s and closed during 1992-1993. Open cast operations began on the site in July 1997 and site works were completed in May 2001. Following the removal of coal during the open cast operations the site was restored to original levels using earthworks compaction methods.

2.3 Geology

A review of Geological Survey of Great Britain, Solid with Drift, Barnsley, Sheet 87, 1976, 1:50,000 scale plan and The Geological Survey of England & Wales, York.275.SW, 1931, 1:10,560 scale plan indicates that to the west of the site within the western edges of the site are alluvial deposits associated with the nearby River Dearne. No other superficial deposits are shown.

The site is shown to be underlain by Upper Carboniferous Middle Coal Measures, the Mexborough or Royston Rock (sandstone) is to the west of the site, and the Ackworth Rock (sandstone) is located to the east of the site. The Shafton coal seam appears to crop very close to or within the site.

In the compaction certificate report written by Babbie on the Houghton Main Opencast Site the geology underlying the entire former opencast site was described as shown below:

The Houghton Main site is within an area that forms part of the Yorkshire Coalfields and lies directly on the Carboniferous Westphalian C Series (the Upper Coal Measures). These strata beneath the site comprise a cyclic series of sandstones, siltstones, mudstones and coal with seat earth that have a general dip of 5o (a gradient of 1 in 11 to 1 in 12) towards the east. There is limited surface drift in the area. Alluvium, comprising silts, sands and gravels, overlies bedrock parallel to and either side of the River Dearne.....

....The three coal seams that were worked by open cast methods at the site were the Highgate and the Shafton Seams and the Highgate Rider that had a limited occurrence in the north east part of the site. Their location beneath the site was delineated by site investigations carried out in 1966 and 1995.....

.....The Shafton Coal outcrops along the south western boundary of the site. The Highgate Coal outcrops across the centre of the site in a north west to south east direction. There are no records to indicate that these seams were worked in the past by underground methods although there is some field evidence of old pillar and stall workings, Reference 4. The site is underlain at depth (greater than 10m) by the Mexborough Rock, a coarse-grained sandstone, iron stained gritstone, which is a minor aquifer in the area. This stratum outcrops to the west of the River Dearne. A fault, trending north east to south west, is located in the southern part of the site. It has a small, south easterly downthrow of less than 2m that diminishes towards the south west.

3.0 PREVIOUS INVESTIGATIONS

Extracts of the following documentation was provided by WSP prior to the start of fieldwork :

- Opencast completion drawings as completed by UK Coal
- Desk Study prepared by WSP
- Draft Opencast Compaction Certification Report prepared by Babbie on behalf of UK Coal.

Signs of previous investigations are present on site including a number of raised and flush borehole covers. These are presumed to be associated with the post-compaction monitoring undertaken by Babbie as part of their Compaction Certification, the figures for this document including the monitoring locations drawing were not present within the document provided.

4.0 WYGE GROUND INVESTIGATION

Ground investigation was undertaken by WYGE as specified by William Saunders Partnership LLP.

The objectives of the investigation were:

- To confirm the location of the opencast highwall.
- To ascertain shallow ground conditions and provide samples for chemical and geotechnical testing.
- To ascertain deeper ground conditions providing samples for geotechnical testing and provide installations for gas and groundwater monitoring.
- To validate backfill compaction.
- To ascertain infiltration rates to assess suitability of soakaway design.
- To provide a full topographic survey of the site.

The initial site investigation was carried out intermittently between 13th and 26th February 2008 with a second Geophysical survey carried out on the 3rd April.

The exploratory hole locations and topographic levels are shown in Figure 2.

4.1.1 Trial pits

Sixteen trial pits were excavated using a 360° tracked excavator to depths of between 1.50m and 3.20mbgl.

4.1.2 Cable Percussive Boreholes

Five cable percussive boreholes were bored on the site to depths between 6.20m and 10.00mbgl.

4.1.3 Dynamic Probe Holes

Fifteen super-heavy dynamic probe holes were drilled on site to depths between 2.50m and 11.10mbgl.

Additional Site Investigation

Additional Site Investigation works were carried out on the 1st and 2nd May 2008. The Exploratory hole locations are shown in Figure 2.

4.1.4 Trial Trenches

Four trial trenches were excavated to rockhead which was encountered at depths of up to 4.9m using a JCB 3CX.

4.1.5 Rotary Open Holes

Fourteen Rotary Open Holes were bored to rockhead which was encountered at depths of between 4.7 and 13.8mbgl.

4.1.6 Contamination Testing

Selected samples recovered during the field investigation were submitted to a UKAS accredited laboratory subcontractor for contamination testing.

The laboratory testing suite undertaken comprised:

- 11No. WYGE Standard soil contamination suites.
- 11No. 2:1 Water soluble sulphate tests.
- 5 No. WYGE Standard soil leachability suites.
- 5 No. WAC 'inert' suites.
- 3 No. WYGE Standard Water contamination suites.

The results of this testing are attached in Appendix C, and are discussed in Section 6.

5.0 ENCOUNTERED SUBSURFACE CONDITIONS

The materials encountered across the site comprised variable depths of 2 separate strata of MADE GROUND.

5.1 Made Ground

The made ground at the site comprised two distinct layers of material, a mottled brown and grey sandy and gravelly clay from the ground surface, overlying light grey-blue clayey gravel with rare to some cobbles of mudstone.

The upper stratum of made ground (generally comprising a mottled grey and light brown sandy gravelly clay, gravel is sub-angular grey mudstone) was encountered between depths of 0.0mbgl to 1.2mbgl. TP08 encountered this material to a depth of 3.2mbgl however the trial pit was located on top of a bund approximately 3m high. This material could be considered to be a capping layer placed on top of the opencast backfill.

The underlying stratum of made ground which was encountered to an unproven depth generally comprised a blue grey very clayey gravel or blue grey very gravelly clay where the gravel comprised sub angular blue-grey mudstone. This material is presumed to be the material used as opencast backfill.

5.2 Superficial Materials

No superficial natural strata were encountered within the site

5.3 Solid Geological Strata

Solid geological strata was encountered in all Rotary Open Holes at depths of between 4.7 and 13.8mbgl.

5.4 Groundwater

Groundwater was not encountered in any of the trial pits.

Groundwater was encountered in all cable percussive boreholes and the levels were recorded during monitoring visits. Figure 11 shows the variation of groundwater levels during the monitoring period.

Data gathered from the Coal Authority for recorded water levels within shallow mine workings, taken from the Dearne Valley borehole National Grid Reference SE4231105757, is shown in Figure 12.

This data would seem to indicate that the groundwater level within the opencast site is concurrent with the regional groundwater levels within the shallow mineworkings.

6.0 CONTAMINATION ASSESSMENT

6.1 Legislation

Part IIA of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) provides a regime for the control of specific threats to health or the environment from existing land contamination. In accordance with the Act and the statutory guidance document on the Contaminated Land (England) Regulations 2000, the definition of contaminated land is intended to embody the concept of risk assessment. Within the meaning of the Act, land is only "contaminated land" where it appears to the regulatory authority, by reason of substances within or under the land, that:

- significant harm is being caused or there is significant possibility of such harm being caused; or
- pollution of controlled waters is being, or is likely to be, caused.

The guidance defines "risk" as the combination of:

- the probability, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and
- the magnitude (including the seriousness) of the consequences.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- a **source**, i.e. a substance that is capable of causing pollution or harm.
- a **pathway**, i.e. a route by which the contaminant can reach the receptor.
- a **receptor** (or target), i.e. something which could be adversely affected by the contaminant.

If one of these elements is missing there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

6.2 Contamination Assessment Methodology

In order to assess the environmental risk posed by contaminants WYGE have undertaken an appraisal of contamination data using Tier 1 Screening Values (TSVs).

Contaminant concentrations below the TSVs are considered not to warrant further risk assessment. Concentrations of contaminants above the TSVs require further consideration of the potential pollutant linkages. It should be noted that exceedance of a TSV does not necessarily indicate that the site requires remediation.

Soils: Derivation of TSVs

In order to assess the soil analysis results with regard to potential human health risks, WYGE TSVs have been derived in accordance with the UK framework set out in the most recent CLR (Contaminated Land Report) documents.

Ongoing research by the EA is being undertaken to produce toxicology reports (TOX series) for each of the contaminants identified within the CLR framework and then to produce Soil Guideline Values (SGVs) using the Contaminated Land Exposure Assessment (CLEA) model. To date, SGVs have been published for only a limited suite of contaminants, each for four standard land use scenarios:

- residential with plant uptake;
- residential without plant uptake
- allotments
- commercial and industrial.

Where SGVs have been published, these are adopted as the TSV. For all other contaminants, TSVs have been derived in accordance with the CLR framework. The soil TSVs derived are provided in Appendix D, together with an indication of the method used for derivation.

For the purposes of this analysis, the 'commercial / industrial' scenario has been utilised with reference to the proposed development.

The CLEA model states that 'the contamination is assumed to be at or within 1m of the surface' (CLR10 pg10). It is considered that at depths greater than 1m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. However, as it is anticipated that some disturbance of made ground will take place, all made ground data (to 1.4m) has been included in the assessment.

The criteria for petroleum hydrocarbons in Appendix D are based on the TPH CWG carbon-banded hydrocarbons classes, as used by WYGE for detailed hydrocarbons risk assessment. A tentative screening criterion, 500mg/kg, has been applied to results available only as 'TPH'. This is considered conservative, assuming that contamination by hydrocarbons more volatile than diesel is unlikely, and that no odours indicative of hydrocarbons contamination were identified.

Leachability

The results of the soil leachability analyses have been assessed against groundwater TSVs. The site is located on a minor aquifer, with the River Dearne and a large lake nearby [1]. Consequently the controlled waters criteria applied have been based on Environmental Quality Standards (EQS) criteria where available, consistent with the Environment Agency 'Level 1' groundwater risk assessment.

6.3 Ground Contamination Assessment

The assessment has been developed based on the proposed development of the site for commercial / industrial use. It should be noted that at the time of writing, analytical data for Waste Acceptance Criteria available from the testing laboratory is incomplete and the report is consequently subject to revision.

Soils

Test results do not indicate any evidence of contamination which may present any risk to human health. All results were considered to be within the range typical of natural soils.

Leachability

All leachability results were within the Level 1 criteria proposed in Appendix D, based on published EQS values except where not available. The only exception was aluminium, for which the Water Supply (Water Quality) Regulations criterion, 200µg/l, was applied. A 2007 Environment Agency document proposes that a future EQS should be based on inorganic monomeric aluminium, the component of most significant toxicity. Consequently, whilst the use of the Water Supply Regulations criterion indicates that leachate may be unsuitable for potable use without treatment, exceedence of this criterion by total aluminium should not be taken as indicative of environmental toxicity. Exceedence of the WSR criterion by 3 of 5

samples, maximum 520µg/l, may not be of concern where the receptor of interest is surface waters.

Groundwater

Three samples of groundwater have been scheduled, the results of this testing will be included within the final version of this report.

Ground Gas

Ground gas monitoring was initially undertaken on 3 occasions between 07 March 2008 and 17 March 2008. Of five boreholes installed for gas monitoring, it has not been possible to monitor 2 (CP-01 and CP-03) due to surface water flooding the borehole location or due to vandalism damage.

Three further visits were carried out between the 09 May 2008 and 03 June 2008, all boreholes were monitored during these visits.

Methane was not detected at any location in excess of 0.1%.

Peak carbon dioxide concentrations of up to 10.8% were recorded, with flow rates of up to 8.2 l/h (not coincident with peak concentration). It was noted that gas emission data for the first 3 monitoring rounds did not identify significant gas concentrations or flows, the variation in later monitoring assumed to be due to variations in atmospheric pressure or groundwater conditions. A maximum carbon dioxide flow rate of 0.06 l/h was recorded.

Based on the guidance in BS8485, the Site Characteristic Gas Situation is assessed as CGS 2 (low hazard potential), based on peak carbon dioxide concentration. All measured gas flow rates were within the CGS 1 (very low hazard) range. Assuming Commercial development, a gas protection score of 2 is required (ref. BS8485, Table 2). Although the selection of gas protection measures is a matter for detailed building design, a score of 2 could for example be achieved by use of a reinforced concrete cast in situ suspended floor slab with minimal services penetrations (score 1.5) and a taped and sealed membrane (0.5).

Waste assessment

Five soil samples were submitted for Waste Acceptance Criteria (WAC) testing. Results are currently awaited from the sub-contracted laboratory and will be issued within the final version of the report.

6.4 Ground Contamination Hazard Assessment

All available data has been collated and evaluated to establish an initial Conceptual Site Model of the site identifying sources, pathways and receptors and pollutant linkages.

Contamination Sources

The site was historically occupied by colliery rail sidings and more recently utilised for opencast coal extraction. Although rail sidings may have potential for contamination by spillage of coal and other cargos; hydrocarbons, coal and ash from locomotives and materials used as track fill, the site has since been substantially disturbed and materials of this nature were not encountered. Materials encountered during the investigation were consistent with natural mineral, and contamination was considered unlikely.

Contamination Pathways

Potential contamination pathways which may apply to the proposed development include:

- Dermal contact
- Ingestion of contaminated soil
- Inhalation of gases, vapours or dusts
- Leaching to surface run-off / drainage / surface waters
- 1. Leaching to groundwater
- Physical contact with building materials
- Plant root contact with soils

The proposed use of the site comprises commercial premises, likely to include associated car parking and landscape areas.

Contamination Receptors

The potential receptors below are anticipated with regard to the development and use of the site.

- Development workers
- Underlying groundwater (minor aquifer)
- Surface waters (River Dearne)
- Occupiers of the proposed development
- Future buildings and installations, and
- Landscape / garden planting

Risks posed to each of the identified potential receptors are discussed separately and assessed against a low, moderate or high scale.

Development Workers

No significant contamination has been identified. Risk to development workers is considered **low**, though due to the potential for hazardous ground gases, controls will be required before entry into excavations.

Underlying Groundwater and Surface Waters

Leachability testing has indicated a **low** risk of pollution of controlled waters.

Occupiers of the proposed development

Risk to occupiers is considered **low**.

Future Buildings and installations

No potential for sulphate attack of concrete has been identified.

Landscape Planting

No indication of conditions unsuitable for plant growth have been identified.

7.0 GEOTECHNICAL ASSESSMENT

7.1 In-Situ Testing

Standard Penetration Tests (SPTs) were undertaken at nominal intervals in all cable percussive boreholes.

The SPT 'N' results are shown on Figures 3 – 7. Where dynamic probes have been undertaken in close proximity to the cable percussive boreholes comparison plots have been created. These plots highlight the variation in results from the two separate test methods despite both tests utilising the same falling weight, over the same fall distance. The general trends of increasing SPT N Value are shown to correlate however.

The standard penetration tests indicate that a minimum SPT N value of 20 could be assumed for the opencast backfill. The comparison plots indicate however that the dynamic probing has recorded lower SPT N values and therefore an SPT N value of 20 should be considered over-optimistic at shallower depths.

7.2 Dynamic Probe tests

15No. Dynamic probe tests were carried out to depths between 2.6m and 11.10mbgl. All probe holes were driven to refusal. Results are included on logs attached in Appendix B.

The table below shows the average SPT N value taken from all of the dynamic probe tests to a depth of 2.0mbgl, the depth of interest for any shallow foundations and also where there is minimal SPT testing within the cable percussive boreholes.

Depth mbgl	Average blow count	Average SPT N Value	Average SPT N Value over depth range
0.1	0.60		8.58
0.2	1.20		
0.3	1.67	4.67	
0.4	1.80	5.60	
0.5	2.13	6.07	
0.6	2.13	6.73	
0.7	2.47	7.60	
0.8	3.00	10.40	
0.9	4.93	12.87	
1	4.93	14.67	
1.1	4.80	15.13	18.10
1.2	5.40	16.53	
1.3	6.33	19.33	
1.4	7.60	21.27	
1.5	7.33	21.60	
1.6	6.67	19.33	
1.7	5.33	19.07	
1.8	7.07	18.20	
1.9	5.80	18.80	
2	5.93	11.73	

An SPT N value of 8 at 1.0mbgl and 18 at 2.0mbgl can therefore be assumed.

7.3 California Bearing Ratio Tests (CBR)

Ten CBR's were carried out across the site at the locations shown in Figure 2. The locations were chosen relative to the proposed highways and parking areas although some locations

were moved on site due to the presence of boggy ground. CBR 10 was attempted but was not completed due to water flowing into the pit, a suitable additional position could not be located.

The CBR results are summarised in the table below and attached in Appendix E.

CBR NO.	Equivalent CBR %
1A	8.7
2	0.9
3	0.6
4	3.3
5	11.1
6A	9.4
7	3.1
8A	7.4
9	1.5
10	NO RESULT

The majority of California Bearing test results fell between 3 and 11%, although five of the CBR values were below 5%. It is likely that the CBR values at the base level of pavement construction (assumed to be around 0.5mbgl) will be adequate for pavement design, if local soft spots are identified during construction works sub base depths can be locally extended to competent strata.

7.4 Soakaway Tests

Four successful infiltration tests were conducted in purpose-dug trial holes (TP05, TP07, TP15 & TP16), one test failed as the pit failed to drain (TP07).

The soakaway tests were calculated in accordance with BRE Digest 365 Soakaway design. Trial pits were excavated to the test strata and the sides squared off. The trial pits were then filled up to the required effective depth and the time taken for the water to soakaway was recorded. The infiltration rate was calculated using the following formula:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

The mean infiltration rate using the BRE 2007 approach was $1.99E-05m.s^{-1}$, if the result from the failed soakaway test is excluded then the mean infiltration rate can be taken to be $2.51E-05 m.s^{-1}$

Where full emptying of the pits was unachievable values were calculated based on the testing period undertaken.

7.5 Geotechnical Laboratory Analysis Results

Selected samples recovered during the site investigation were submitted to a UKAS accredited laboratory for geotechnical testing. The geotechnical testing suite undertaken consisted of the following:

- 14 Atterberg Limits tests.
- 12 Particle Size Distribution tests (wet sieve)
- 14 Bulk Density tests
- 15 Moisture Content tests
- 14 2:1 Sulphate tests
- 14 Total Sulphate tests
- 12 Total Sulphur tests

Full laboratory test results for the testing are included in Appendix F, and the results are discussed below.

7.5.1 Moisture Content

Moisture content tests produced moisture contents of between 7% and 20%.

Figure 8 shows that the moisture content does not vary with depth below ground level

7.5.2 Atterberg Limits Testing

Atterberg Limits testing undertaken on materials from the site indicated that materials were typically CLAY's of intermediate plasticity. 9 results were indicative of intermediate plasticity clays and 2 results were indicative of low plasticity. 1 result was indicative of a intermediate plasticity silt and two samples were not tested due to insufficient sample.

Liquid limit values ranged between 33% to 40% while plasticity indices ranged between 14% and 19%.

7.5.3 Particle Size Distribution and Sedimentation tests

Twelve Particle Size Distribution (PSD) tests were carried out across the site and all results were indicative of a reasonably uniform material classified as a sandy very gravelly SILT/CLAY.

Figure 9 compares the total soil fractions for all particle size distribution tests and illustrates the uniformity of material.

The samples tested had a GRAVEL content of between 17.58% and 40.74%, a SAND content of between 7.32% and 25.52% and a SILT or CLAY content of between 33.74% and 74.68%.

7.5.4 Aggressive Chemical Environment for Concrete

Fourteen samples were tested for Acid Soluble Sulphate, fourteen samples were tested for water soluble sulphate and twelve samples were tested for total sulphur solid.

As a data set of more than ten samples had been collected the analysis fo test results has been undertaken on the top 20% of test results as specified within Concrete in aggressive ground BRE Special Digest 1. A summary table of the results is included within this report as

Appendix G.

The results of the water soluble sulphate tests all indicated a concrete class DS-1 to be sufficient. The total potential sulphate value, calculated using the total sulphur solid result, indicated that a concrete class DS-3 would be required. The material was found to have an oxidisable sulfide level of 0.73%.

7.6 Excavations

It is anticipated that excavation to normal founding depths should be possible using normal hydraulic plant.

Should excavations be required to remain open for a period of time, or where collapse may threaten existing or proposed works, plant or equipment, or where man entry is proposed, trench support will be required. Support to excavations should follow guidance given in CIRIA Report 97 'Trenching Practice'.

8.0 GEOPHYSICAL INVESTIGATION

APEX Geoservices (UK) Ltd. were requested by White Young Green Environmental Ltd to carry out geophysical surveys of the site to investigate the presence and location of the former opencast high wall. The work was carried out in three phases with the first phase of the field work carried out between the 14th and 15th February 2008.

The second phase of the work was carried out on the 3rd April 2008 and the third phase was carried out on the 29th April 2008.

The APEX Geoservices (UK) Ltd report is included within this report as Appendix H and is summarized below. Figure 10 shows the location of all survey lines and the interpreted locations of the opencast high wall.

8.1 Geophysical Section A

This section was located in the central and northern part of the site and crossed a bund between the edge of the site and a disused railway. The observed resistivities (2D Resistivity Profile R1) were generally in the range of 10 – 80 ohm m (interpreted as backfill material), but higher resistivities (> 80 ohm m) were observed near the base of the profile towards the edge of the backfilled opencast area.

Seismic Refraction Profile S3 indicated a four-layer model with a low velocity surface layer (441 m/s) interpreted as soil or loose fill, over the bund, and extending to approximately 2m over the leveled part of the site. The underlying seismic layers indicated a gradual increase in velocity from 1050 – 1200 m/s as might be expected from compacted landfill. The seismic layers indicated an upward gradient towards the edge of the backfilled area which was coincident with the higher resistivity zone. The higher resistivity zone (> 80 ohm m) and the upward gradient of the seismic layers has been interpreted as the location of the highwall in this area.

8.2 Geophysical Section B

This section was located in the north-west of the site, and was over flat ground.

An obvious increase in resistivity was seen towards the edge of the backfilled area and at the base of 2D Resistivity Profile 2. This has been interpreted as the boundary between backfill and in-situ coalmeasures, and was therefore used to interpret the other resistivity profiles.

Seismic Refraction profile S2 indicated a three layer model with soil/loose fill within an apparent surface depression on the edge of the backfilled area (561 m/s), and compacted material towards the centre of the site (871 m/s). An increase in velocity to 1957 m/s towards the edge of the backfilled area and at a depth of approximately 14m correlates well with the higher resistivity zone on Resistivity Profile R2.

8.3 Geophysical Section C

This section was located in the south-western part of the site over gently sloping ground. Initially, 2D Resistivity Imaging Profile R3 was acquired and indicated resistivities in the range of 10 – 70 ohm m, which were interpreted as backfill material. It was therefore decided to acquire an additional Profile (R5) to ensure that the highwall had been crossed. Profile R5 indicated an increase in resistivity (>80 ohm m) away from the backfilled area and has been interpreted as indicating the location of the highwall.

A four layer model was constructed from Seismic Refraction Profile S1 which indicated a gradual increase in P-wave velocity similar to Profile S3 of Geophysical Section A, and has been interpreted as compacted fill.

8.4 Geophysical Section D

This section was located in the north-eastern part of the site and crossed the bund. 2D Resistivity Profile R4 indicated resistivities in the range of 10 – 60 ohm m over the bund and

towards the central part of the site over the backfilled area. An increase in resistivities (> 80 ohm m) away from the backfilled area was interpreted as the location of the highwall.

Seismic refraction profile S4 indicated a two layer model with a thin (1 - 2m) layer with a velocity of 244 m/s indicative of soil or loose fill, over a layer of velocity 1093 m/s which was interpreted as homogeneous backfilled material.

8.5 Geophysical Section E

This section was located in the north-eastern part of the site and crossed the bund between and parallel to Geophysical Sections A and D, closer to Geophysical Section A.

2D Resistivity Profile R6 indicated resistivities in the range of 10 – 60 ohm m from beneath the bund and towards the central part of the site over the backfilled area which has been interpreted as the backfill material. Towards the edge of the site (to the NW), the resistivities increase slightly, but do not reach 80 ohm m until about 6m from the end of the profile where the depth of investigation is minimal. However, the character of the profile is similar to Geophysical Section F (see below) where the high wall has been fairly confidently interpreted, and thus the character of Section F was used to refine the interpretation of the highwall on Section E. An increase in resistivities (>80 ohm m) at depth of between 6 – 14m beneath the central area of the resistivity profile has been interpreted as evidence of a ridge of bedrock running along the openpit floor.

Seismic refraction profile S5 indicated a three layer model with a thin (2 - 3m) layer with a velocity of 556 m/s indicative of soil or loose fill, over a layer of velocity 862 m/s interpreted as more compact fill material showing a similar increase in compaction of the fill as seen in Sections A and C. A third layer of P-wave velocity 1596 m/s correlating with the 70 ohm m resistivity contour, and giving further credence to an interpretation of a ridge of bedrock running along the former openpit floor.

8.6 Geophysical Section F

This section was located in the north-eastern part of the site and crossed the bund between and parallel to Geophysical Sections A and D, closer to Geophysical Section D.

2D Resistivity Profile R7 indicated resistivities in the range of 10 – 60 ohm m over the bund and towards the central part of the site over the backfilled area. An increase in resistivities (> 80 ohm m) away from the backfilled area was interpreted as the location of the highwall. At depth to the NW of the profile a localised increase in resistivities (> 80 ohm m) has been tentatively interpreted as an indication of a bench.

Seismic refraction profile S6 indicated a three layer model with a thin (1 - 3m) layer with a velocity of 613 m/s indicative of soil or loose fill, over successive layers of 746 m/s and 871 m/s interpreted as homogeneous backfilled material with compaction increasing with depth.

8.7 Geophysical Section G

This section was located in the western part of the site between Geophysical Sections A and D, parallel to Geophysical Section A.

2D Resistivity Profile R8 is similar in character to the neighbouring Profile R2, and again indicated resistivities in the range of 10 – 60 ohm m over the bund and towards the central part of the site over the backfilled area. An increase in resistivities (> 80 ohm m) away from the backfilled area was confidently interpreted as the location of the highwall, but the absence of an increase in resistivity along the base of the profile suggests that the original openpit floor may be deeper in this area.

Seismic refraction profile S7 indicated a three layer model with a thin (1m) layer with a velocity of 542 m/s indicative of soil or loose fill, over successive layers of 782 m/s and 922 m/s interpreted as homogeneous backfilled material with compaction increasing with depth.

8.8 Geophysical Section H

This section was located in the south-western part of the site parallel to and some 60m from Geophysical Section C.

The 2D resistivity imaging profile (R10) exhibits an obvious zone of higher resistivities (>80 ohm m) 38 m from the western end which was interpreted as the location of the highwall. This position is approximately 5m further away from the River Dearne than the position marked on

the abandonment plan. A refracting horizon of 1965 m/s has been interpreted as indicating the base of the landfill.

8.9 Geophysical Section J

This section was located in the western part of the site parallel to and some 36m from Geophysical Section B.

The 2D resistivity imaging profile (R11) is similar in character to profile R10 of Geophysical Section H, with an obvious zone of higher resistivities (>80 ohm m) 58.5 m from the western end which was interpreted as the location of the highwall. This position is approximately 3m further away from the River Dearne than the position marked on the abandonment plan. A refracting horizon of 1948 m/s has been interpreted as indicating the base of the landfill.

8.10 Geophysical Section K

This section was located in the northern part of the site sub-parallel to and approximately 45 m from Geophysical Section D.

The 2D resistivity imaging profile (R12) is similar in character to the profiles on the southern boundaries of the site, with an obvious zone of higher resistivities (>80 ohm m) 59 m from the northern end and is coincident with the position marked on the abandonment plan. A second zone of higher resistivities (>80 ohm m) is also apparent approximately 13 m further along the profile, and extending for 18 m. This zone has resistivities similar to those interpreted as in-situ Coal Measures, but has a P-wave velocity of 586 m/s, which is consistent with loose fill material. The feature is therefore interpreted as a zone of higher resistivity fill material, possibly backfilled sandstone. A refracting horizon of 1837 m/s has been interpreted as indicating the base of the landfill.

9.0 FOUNDATION ASSESSMENT

It is understood that the proposed development is for a number of industrial units with varying sizes of car parking areas and associated carriageways, all constructed using standard construction techniques.

The interpreted location of the opencast highwall impacts on the proposed development. Due to the risk associated with differential settlement of a building founded across an opencast highwall the development currently proposed should be reviewed and the size and location of some units amended.

In the upper sections of the dynamic probe boreholes the opencast backfill shows considerable variation in potential bearing capacity and in its current state would not be suitable for shallow foundations. It is therefore our opinion that in order to construct any development on the site that ground improvement techniques are utilised to improve the bearing capacity and minimise the potential for ongoing settlement.

There are several options for ground treatment that could be utilised across the site. These include

1. The area could undergo dynamic compaction to provide a uniform development area with a minimum bearing capacity of 75kN/m^2 and the industrial units constructed on raft foundations.
2. The industrial units could be founded on vibro stone columns.

The nature of any ground improvement should be confirmed after discussions with a suitable ground improvement contractor.

10.0 GEOTECHNICAL CONCLUSIONS

- An SPT N value of 8 at 1.0mbgl and 18 at 2.0mbgl can be assumed although the dynamic probe boreholes indicated a wide variation in recorded N values within the upper sections of the opencast backfill.
- The majority of California Bearing test results fell between 3 and 11%, although five of the CBR values were below 5%. It is likely that the CBR values at the base level of pavement construction (assumed to be around 0.5mbgl) will be adequate for pavement design, if local soft spots are identified during construction works sub base depths can be locally extended to competent strata.
- The mean infiltration rate using the BRE 2007 approach to soakaway tests was $1.99E-05m.s^{-1}$, if the result from the failed soakaway test is excluded then the mean infiltration rate can be taken to be $2.51E-05 m.s^{-1}$
- Moisture content tests produced moisture contents of between 7% and 20%.
- Atterberg Limits testing undertaken on materials from the site indicated that materials were typically CLAY's of intermediate plasticity
- Particle Size Distribution (PSD) tests were were indicative of a reasonably uniform material classified as a sandy very gravelly SILT/CLAY
- The results of the water soluble sulphate tests all indicated a concrete class DS-1 to be sufficient. The total potential sulphate value, calculated using the total sulphur solid result, indicated that a concrete class DS-3 would be required. The material was found to have an oxidisable sulfide level of 0.73%.
- It is anticipated that excavation to normal founding depths should be possible using normal hydraulic plant
- A review of Figures 10 & 11 indicate the monitored groundwater levels on site to be concurrent with the regional water level within shallow mineworkings as monitored by The Coal Authority at the Dearne Valley borehole. The water level within the opencast backfill on the site can therefore be said to have recovered.
- Geophysical Resistivity and Seismic surveys have been interpreted and indicate the locations of the opencast high wall along eleven separate survey lines within the site.
- In the upper sections of the dynamic probe boreholes the opencast backfill shows considerable variation in potential bearing capacity and in its current state would not be suitable for shallow foundations. It is therefore our opinion that in order to construct any development on the site that ground improvement techniques are utilised to improve the bearing capacity and minimise the potential for ongoing settlement.

11.0 GEO-ENVIRONMENTAL CONCLUSIONS

- No significant contamination has been identified. Risk to development workers is considered **low**, though due to the potential for hazardous ground gases, controls will be required before entry into excavations.
- Leachability testing has indicated a **low** risk of pollution of controlled waters.
- Due to elevated concentrations of carbon dioxide, a site Characteristic Gas Situation of 2, low hazard potential, is assessed. Basic gas protection measures, for example a suspended floor slab and membrane providing an aggregate protection score of 2 (Ref. BS8485), will be required for Commercial development.
- No potential for sulphate attack of concrete has been identified.
- No indication of conditions unsuitable for plant growth have been identified.

12.0 RECOMENDATIONS

A mean infiltration rate of $1.99\text{E-}05\text{m.s}^{-1}$ was calculated from on site Soakaway tests. Calculations for Soakaway design should take into consideration variations in permeability measured across the site.

It is our opinion that in order to construct any development on the site that ground improvement techniques are utilised to improve the bearing capacity and minimise the potential for ongoing settlement.

There are several options for ground treatment that could be utilised across the site. These include

- The area could undergo dynamic compaction to provide a uniform development area with a minimum bearing capacity of 75kN/m^2 and the industrial units constructed on raft foundations.
- The industrial units could be founded on vibro stone columns.

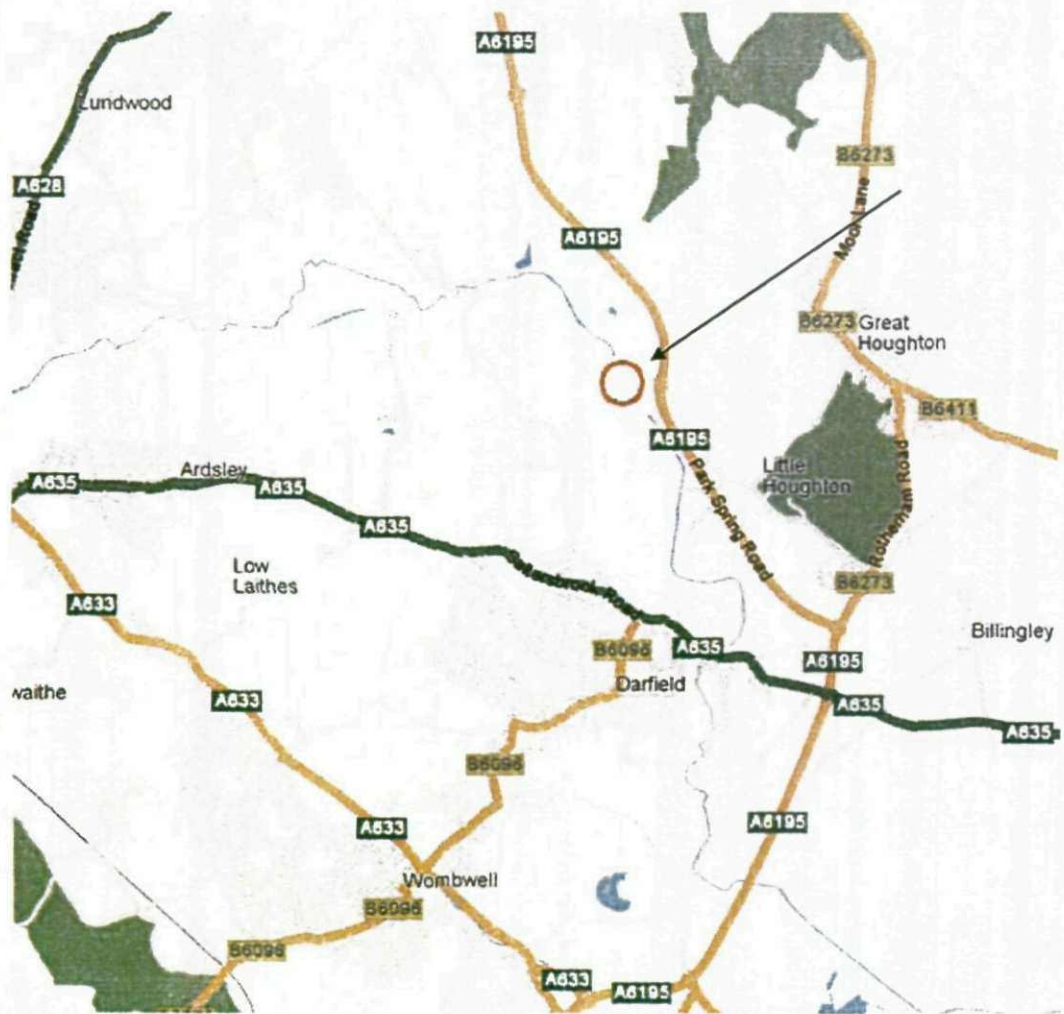
The nature of any ground improvement should be confirmed after discussions with a suitable ground improvement contractor.

To limit potential for differential settlement across the highwall it is important to ensure that building foundations are not constructed across the zone of influence of this interface. Layouts should be amended to account for this.

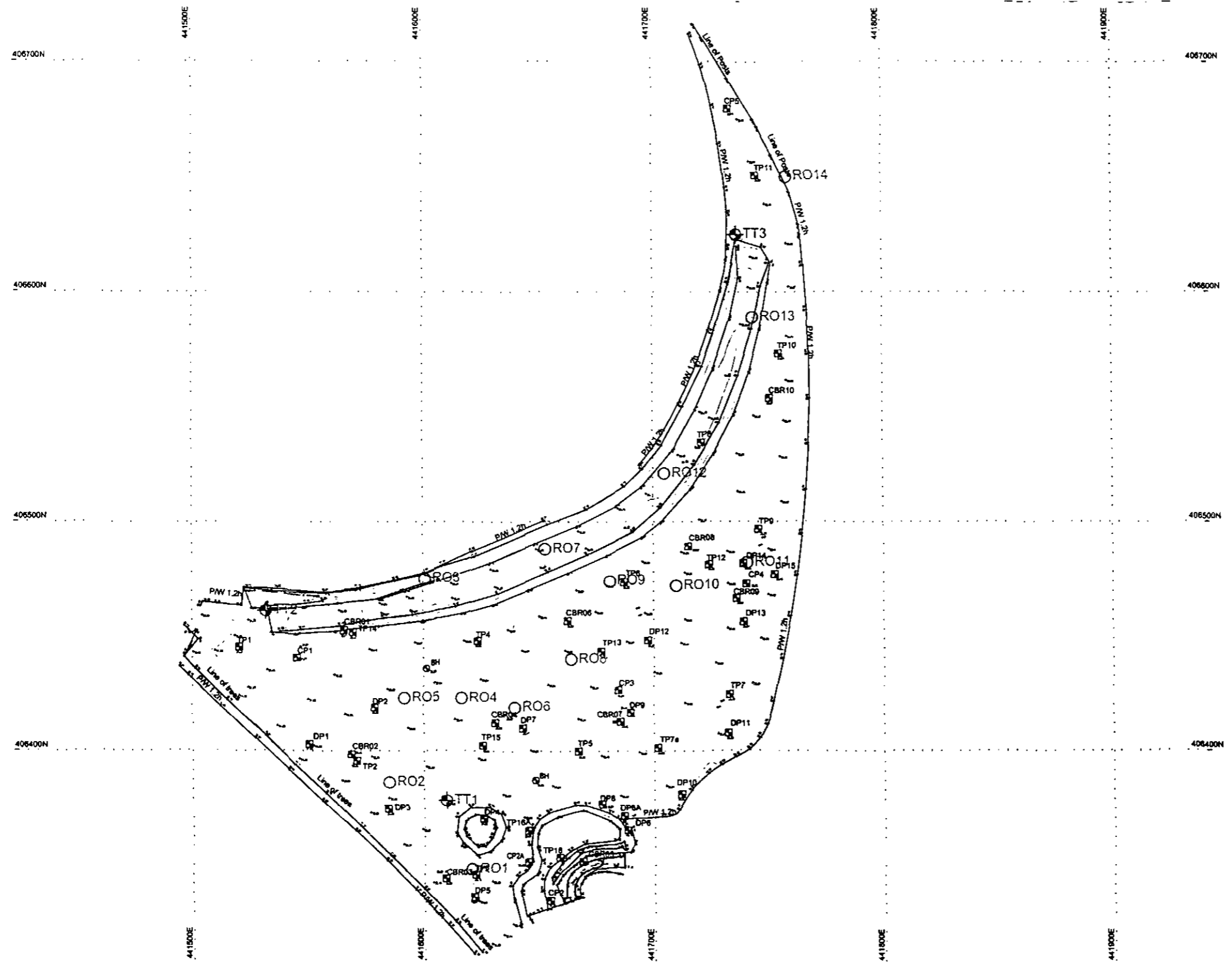
References:

1. Desk Study report by Wm. Saunders Partnership LLP
2. Houghton Main Opencast Site, Draft Compaction Certification by Babtie
3. BS5930 Code of practice for site investigations
4. Concrete in aggressive ground BRE Special Digest 1

Figure 1: Site Location Plan



KEY
 □ BOREHOLE
 ⊙ EXPLORATORY BOREHOLE



Rev	Description	By	Chk	App	Date
A	RO & TT POSITIONS ADDED				18.06.08

Client
 WILLIAM SAUNDERS PARTNERSHIP LLP

Newstead Court
 Little Oak Drive
 Sherwood Business Park
 Annesley
 Notts, NG15 0DR

Tel: 01823 684550
 Fax: 01823 684551
 e-mail: cc@wyounggreen.com
 website: www.wyg.com



Consulting Engineers

Our Services: Environmental, Health & Safety, Air Quality, Noise, Drainage, Groundwater, Remediation, Risk Assessment, Sustainability, Transportation

Project
 MOUGHTON MAIN BP GRIMETHROPE

Drawing Title
 TOPOGRAPHIC SURVEY &
 EXPLORATORY LOCATION PLAN

Scale	Drawn By	Date	Checked By	Date	Approved By	Date
1:1000	P. Hester	23.02.08	CA	23.02.08		
Project No.	Office	Form	Drawing No.	Revision		
A042741	5101	ENV	FIGURE 2			

APPROVAL INFORMATION TENDER CONTRACT CONSTRUCTION

Figure 3 - CP01 / DP01 / DP02 COMPARISON

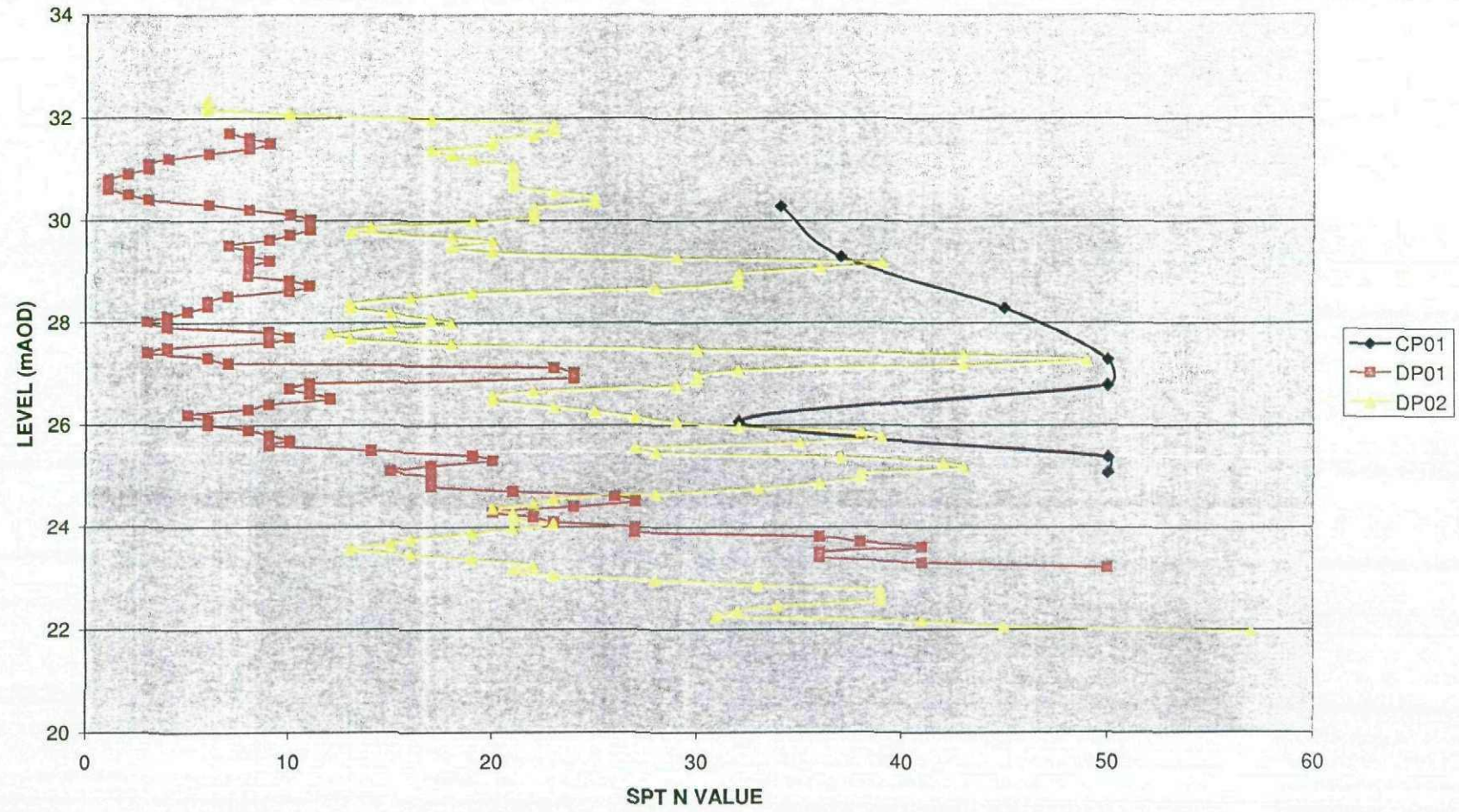


Figure 4 - CP02 / DP05 / DP04 COMPARISON

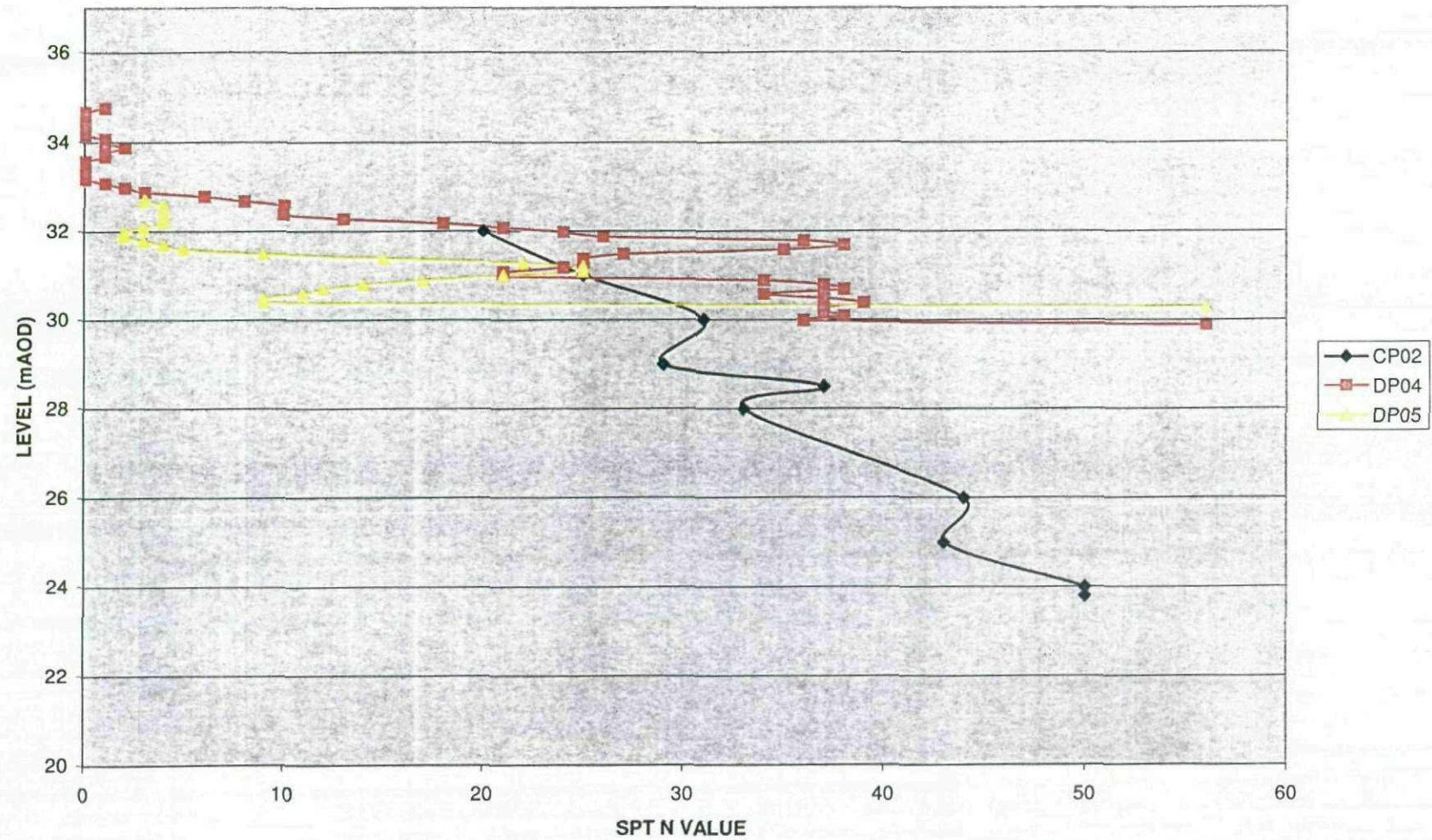


Figure 5 - CP03 / DP09 COMPARISON

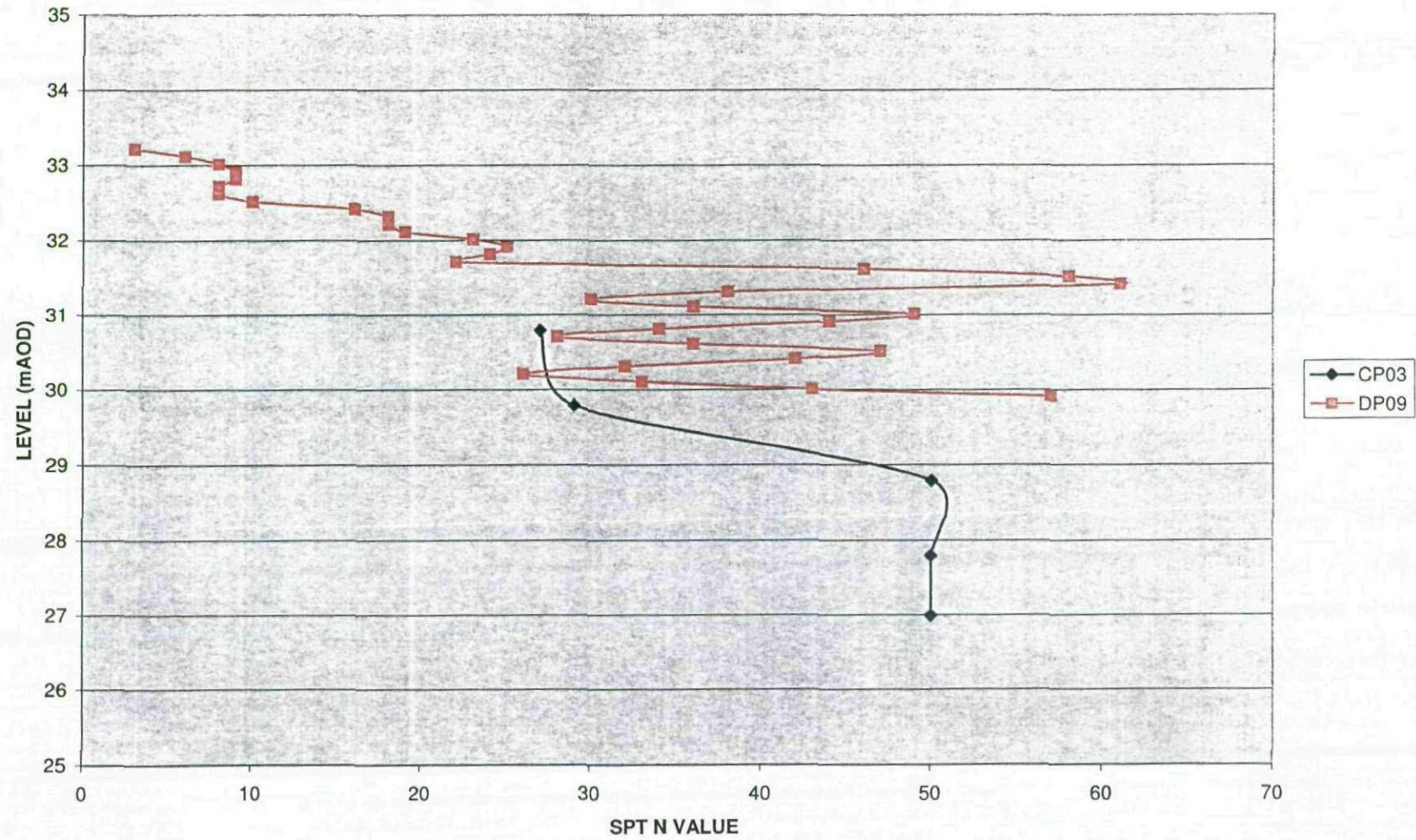


Figure 6 - CP04 / DP13 / DP14 / DP15 COMPARISON

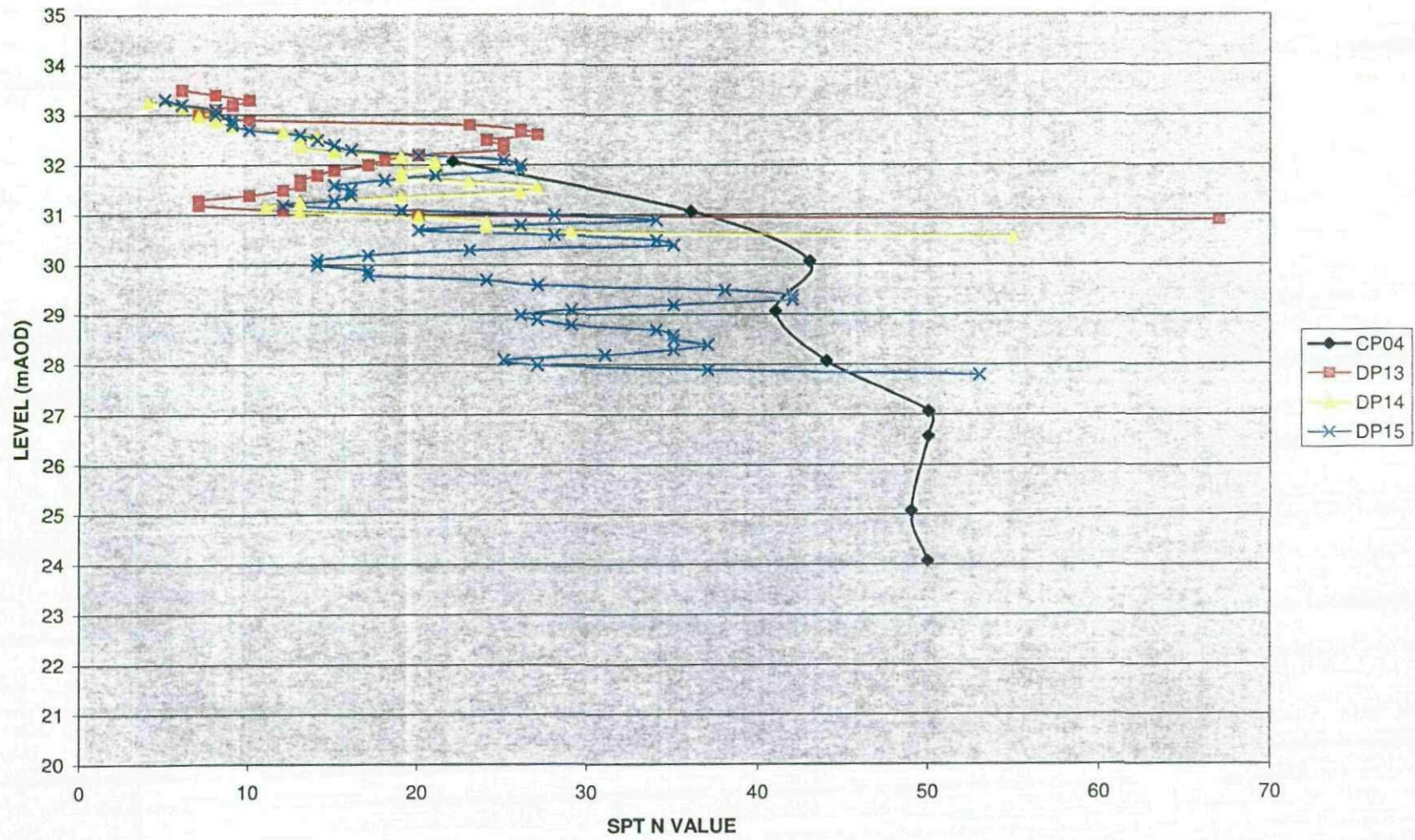


Figure 7 - CP05 SPT Plot

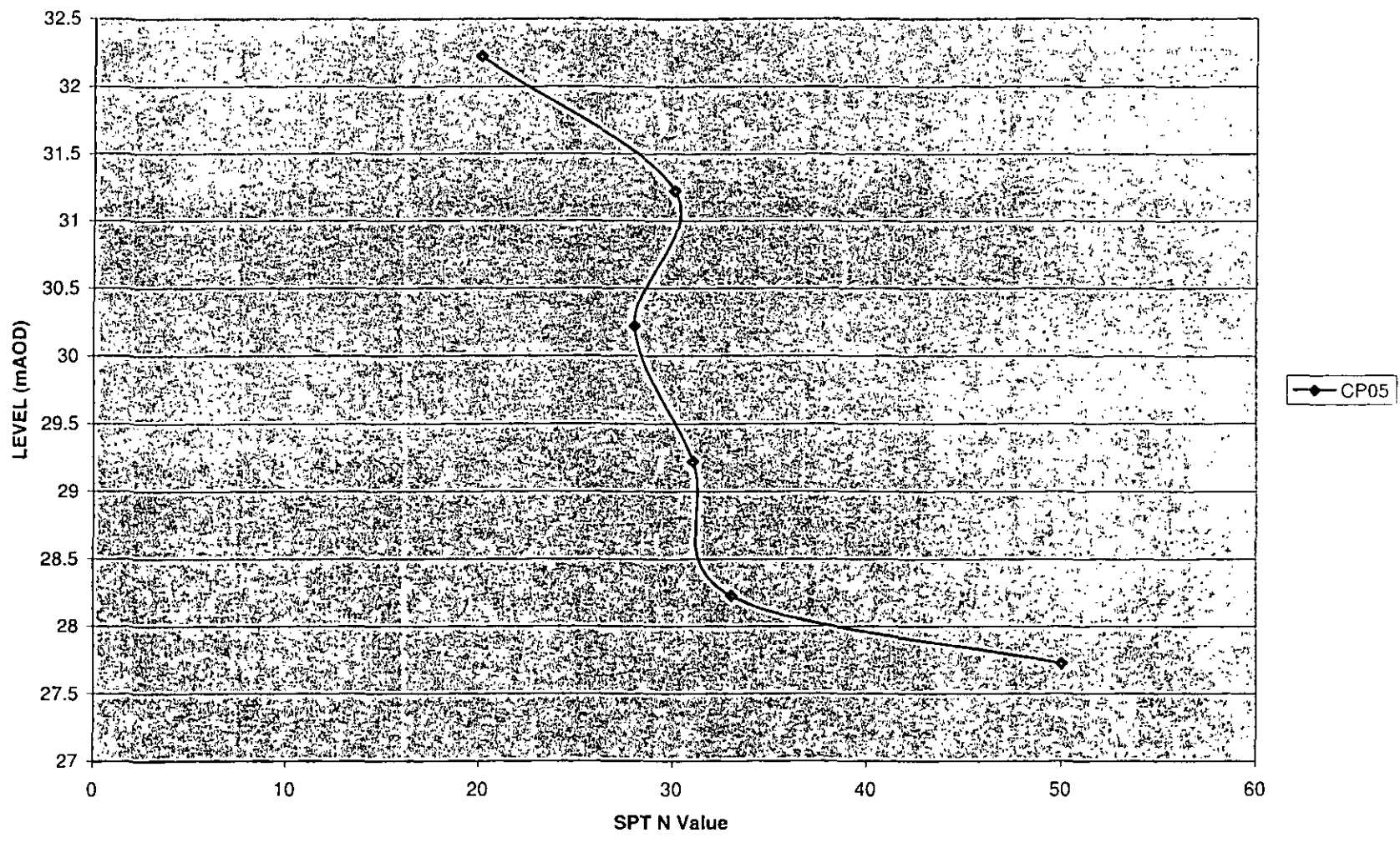


Figure 8 - Moisture Content v Depth

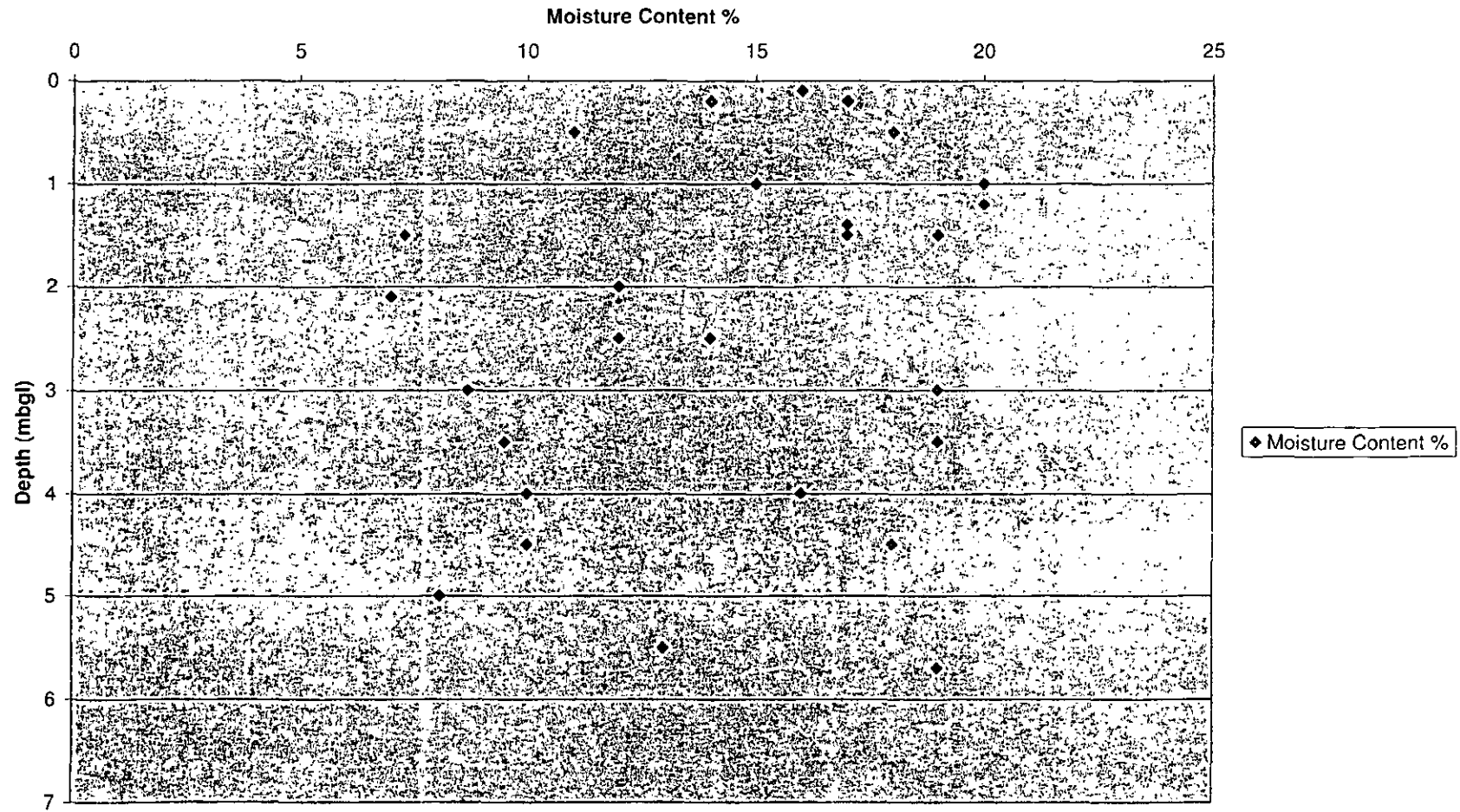
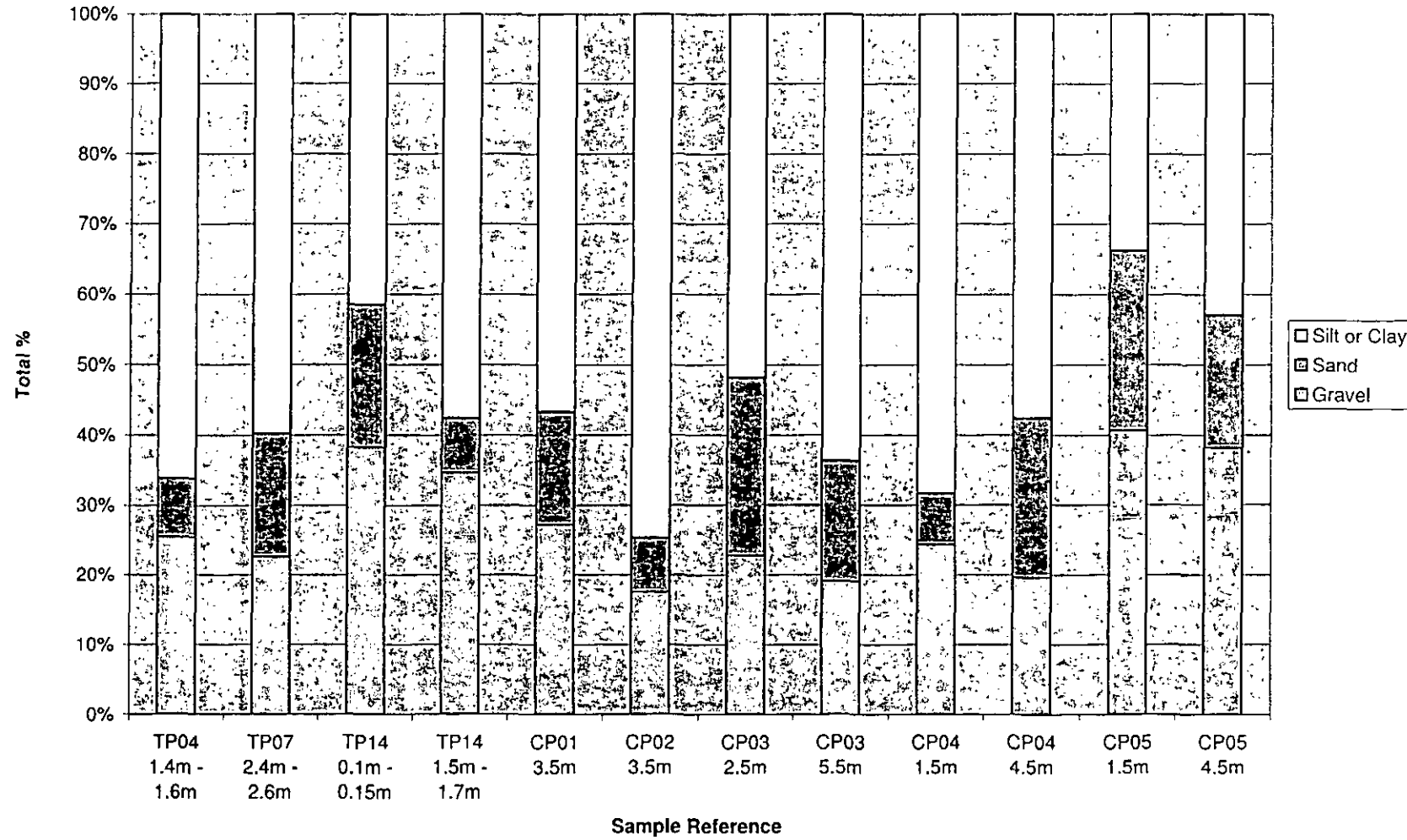
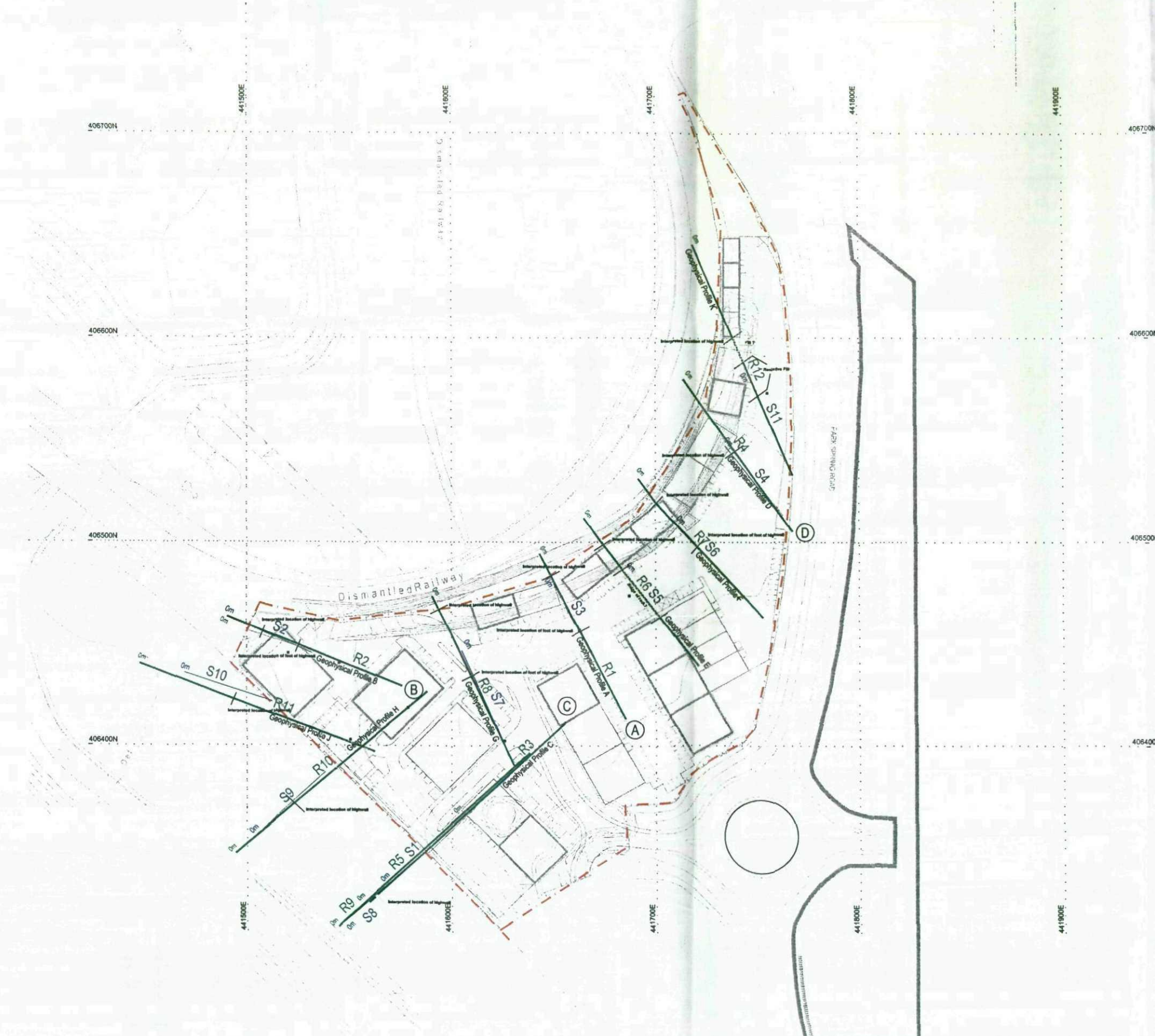


Figure 9 - PSD - Soil Fraction Comparison





Rev	Description	By	Chk	App	Date
A	GEOPHYS LINES UPDATED		ATF	TY	18.06.08

Saved location path

Client
WILLIAM SAUNDERS PARTNERSHIP LLP

Newslead Court
Little Oak Drive
Sherwood Business Park
Annesley
Notts, NG15 0DR

Tel: 01823 684550
Fax: 01823 684551
e-mail: nottingham@wyg.com
website: www.wyg.com

**White
Young
Green**

Consulting Engineers
Civil Electrical Environmental Health & Safety Highway Management Services Mechanical Fluid Structural Town Planning Transportation

Project:
HOUGHTON MAIN BP GRIMETHROPE

Drawing Title:
**FIGURE 10
GEOPHYSICAL SURVEY PLAN**

Scale at A1	Drawn By	Date	Checked By	Date	Approved By	Date
1:1000	PV	26.02.08	CA			
Project No.	Office	Type	Drawing No.	Revision		
A042741	5101	ENV	FIGURE 10	A		

Figure 11 - Monitored Groundwater Levels

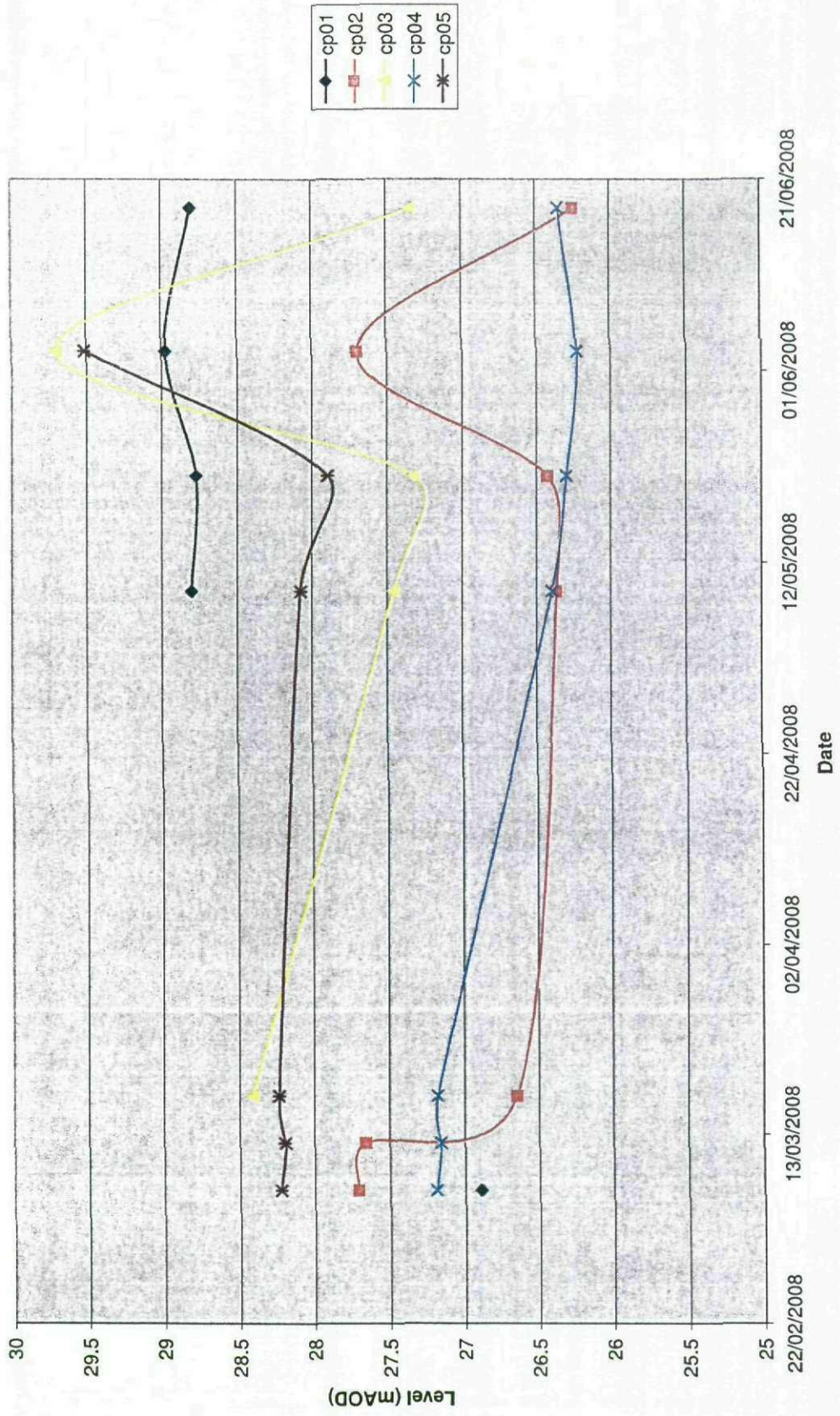


Figure 12 - Coal Authority Shallow Mineworkings Water Level

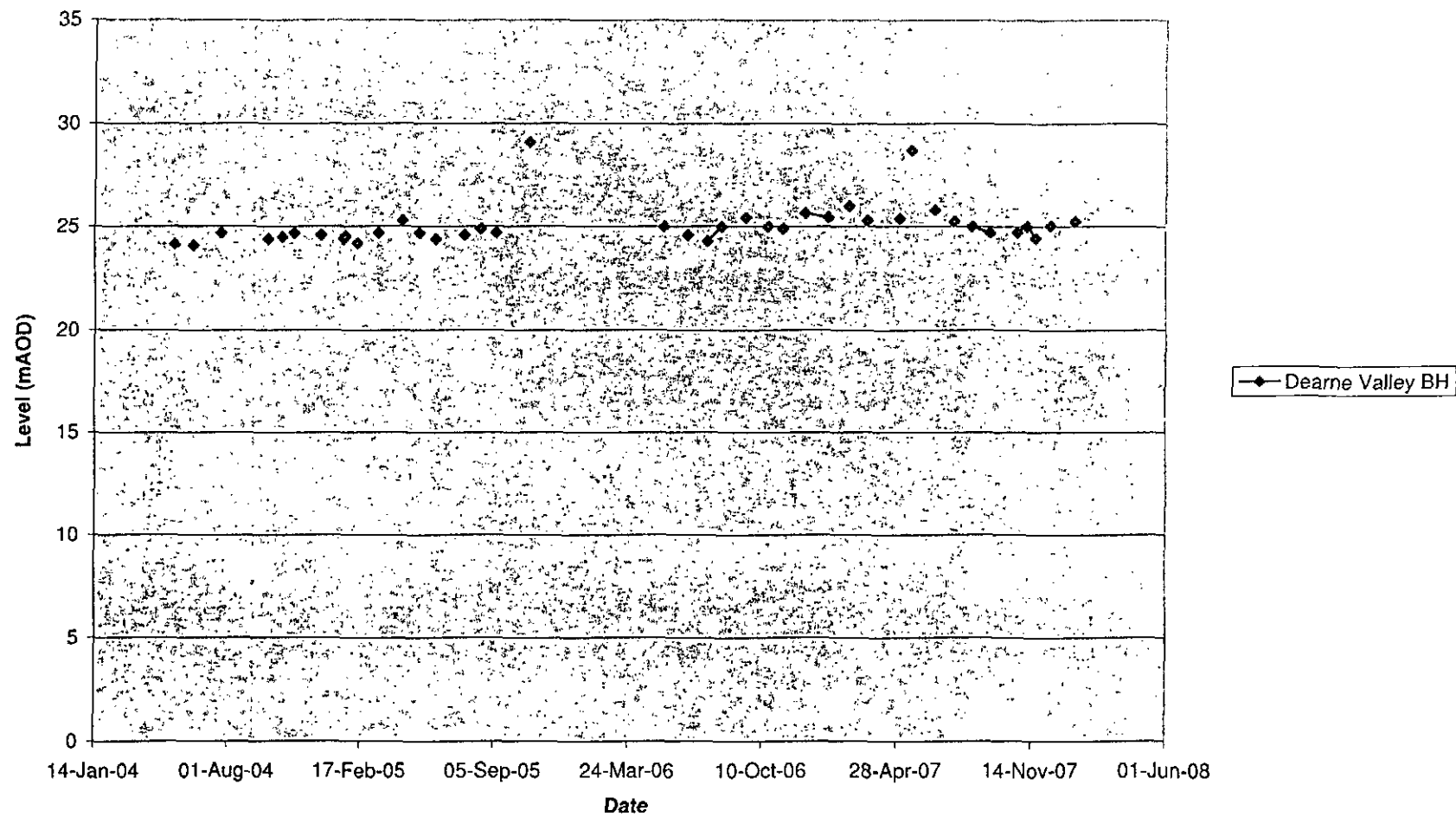


FIGURE 13 - TP05 SOAKAWAY

Project : Grimethorpe		Trial Pit TP05 Test 1	
Project No: A042741		Date 05.12.2007	
TEST NO	1		
		Trial pit length (m)	2.9
ELAPSED TIME (minutes)	WATER LEVEL (mbgl)	Trial pit width (m)	0.7
0	0.31	Trial pit depth (m)	2.65
10	0.41		
23	0.54		
		Effective depth (head of water)	2.34
50	0.74		
67	0.85		
100	1.06		
108	1.11		
133	1.24		
155	1.36		
173	1.44		
188	1.49		
212	1.6		
229	1.66		
		Total depth	
			Effective depth

Soil infiltration rate $f = 1.90785E-05$ m/s

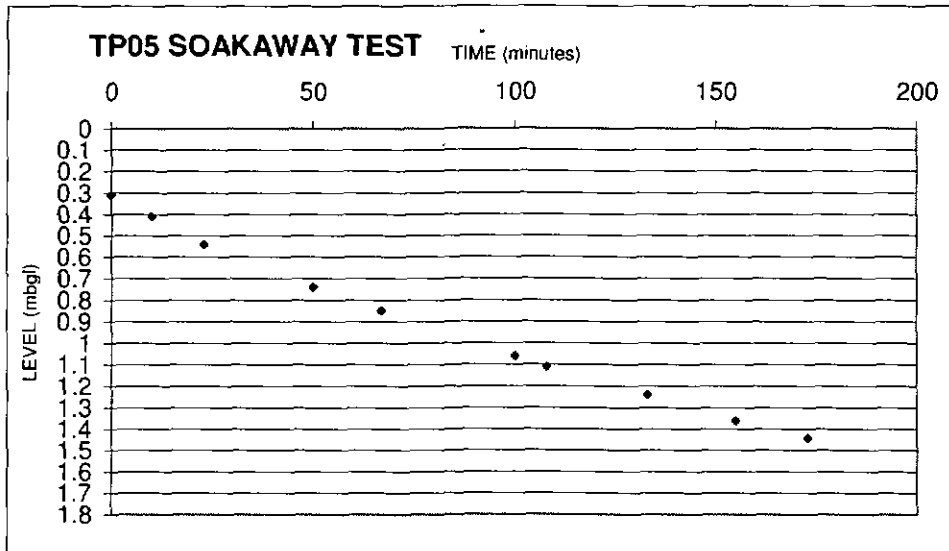


FIGURE 14 - TP07 SOAKAWAY

Project : Grimethorpe		Trial Pit TP07 Test 1	
Project No: A042741		Date 05.12.2007	
TEST NO	1	Trial pit length (m)	2.8
ELAPSED TIME (minutes)	WATER LEVEL (mbgl)	Trial pit width (m)	0.7
0	0.12	Trial pit depth (m)	2.6
21	0.17	Effective depth (head of water)	2.48
37	0.19	Level at Tp 25%	
59	0.22	Level at Tp 75%	
81	0.25		
126	0.32		
143	0.35		
161	0.37		
183	0.39		
200	0.41		
			gl
		Total depth	
			Effective depth

Soil Infiltration rate f = 4.4504E-06 m/s

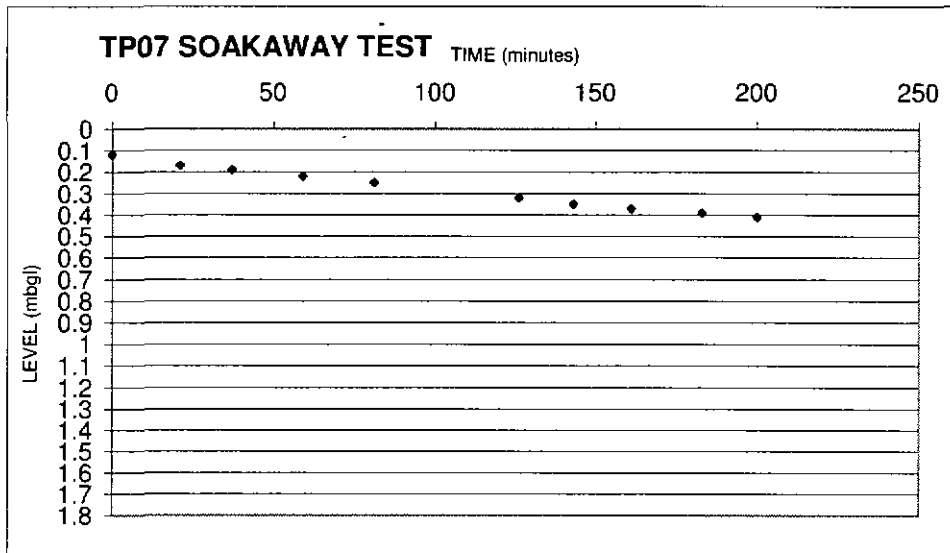
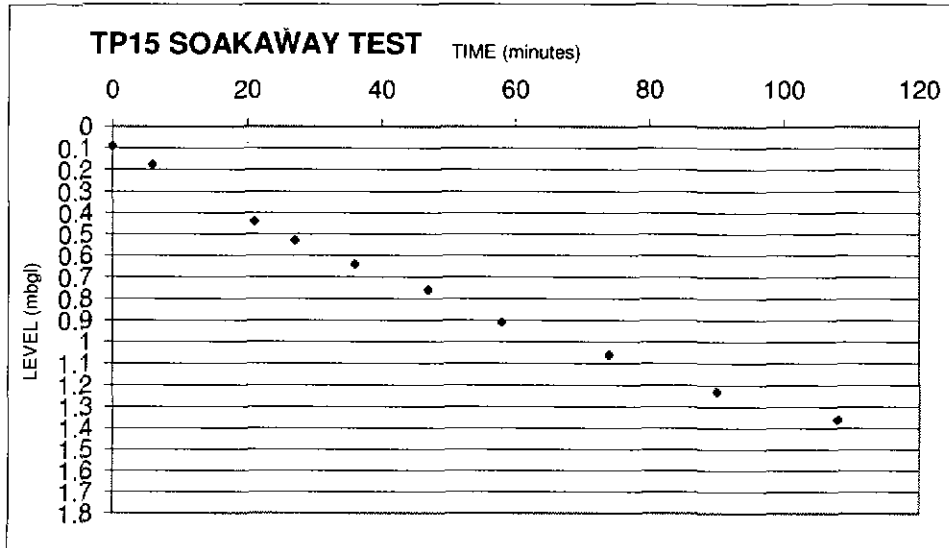


FIGURE 15 - TP15 SOAKAWAY

Project : Grimethorpe		Trial Pit TP15 Test 1	
Project No: A042741		Date 05.12.2007	
TEST NO	1	Trial pit length (m)	2.8
ELAPSED TIME (minutes)	WATER LEVEL (mbgl)	Trial pit width (m)	0.7
0	0.09	Trial pit depth (m)	2.3
6	0.175	Effective depth (head of water)	2.21
21	0.44	Level at Tp 25%	
27	0.53	Level at Tp 75%	
36	0.64		
47	0.76		
58	0.91		
74	1.06		
90	1.23		
108	1.36		

Soil Infiltration rate $f = 1.90785E-05$ m/s



APPENDICES

APPENDIX A
REPORT CONDITIONS

WHITE YOUNG GREEN ENVIRONMENTAL

APPENDIX A - REPORT CONDITIONS

Geo-Environmental Site Investigation Factual and Interpretative Report

*This report is produced solely for the benefit of **William Saunders Partnership** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise. This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site as characteristics, especially liquid and gaseous materials, are likely to vary with time.*

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development requires evaluation by other involved parties.

Whilst confident in the findings detailed within this report because ground conditions is not an exact science, subject to risk analysis, we are unable to give categoric assurances that they will be accepted by others as they may have differing objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tested for some of the more common chemicals generally expected, including any highlighted in the client's instructions. Other concentrations or types of chemicals may exist. Factual results are presented initially compared to commonly adopted guidelines which are not definitive in the UK and should be further assessed for actual risk.

**APPENDIX B:
EXPLORATORY HOLE RECORDS AND KEY**



WHITE YOUNG GREEN ENVIRONMENTAL
 Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **CP1**

Sheet 1 of 1
 Scale 1:50

Project: **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Cable Percussive**

Co-ordinates: 441545.09E - 406440.67N
 Ground Level : 31.77 mAOD

Start Date : 26/02/08
 Finish Date : 26/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of firm blue-grey very gravelly clay. gravel is sub angular to angular fine to coarse weak blue-grey mudstone. (MADE GROUND)		29.27	2.50				0.00	B	
							0.50	D B	
							1.00	D	
							1.50	S D B	
							2.00	D	
MADE GROUND consisting of blue-grey clayey gravel. gravel is sub angular to angular fine to coarse blue-grey mudstone. (MADE GROUND)		26.07	5.70				2.50	S D B	N=34 (7.9.8.9.8.9)
							3.00	D	N=37 (8.9.9.8.9.11)
							3.50	S D B	
							4.00	D	N=45 (10.15.11.12.10.12)
							4.50	S D B	
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular fine to coarse weak blue-grey mudstone. (MADE GROUND)		25.57	6.20				5.00	S D B	N=50 (10.12.14.13.12.11)
							5.70	S D B	N=80 (13.12.30.22.25.3)
MADE GROUND consisting of grey gravel. gravel is sub angular to angular fine to coarse mudstone and sandstone. (MADE GROUND)		25.37	6.40				6.20	D S	N=32 (4.8.10.8.9.5)
							6.40	S D	50/75mm (25,50)
MADE GROUND consisting of grey gravel. gravel is sub angular to angular fine to coarse mudstone. (MADE GROUND)		25.27	6.30				6.70	S D	70/225mm (16.9.20.24.26)
							6.80		
Exploratory Hole complete at 7.00 m									

Observations:

JOB NUMBER

Logged By : **TCY**

Checked By :

Figure No.: **FIG**



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
Sherwood Business Park, Annesley, Notts, NG15 0DR
Tel. 01623 684550 Fax. 01623 684551

Borehole Number **CP2**

Sheet 1 of 1
Scale 1:50

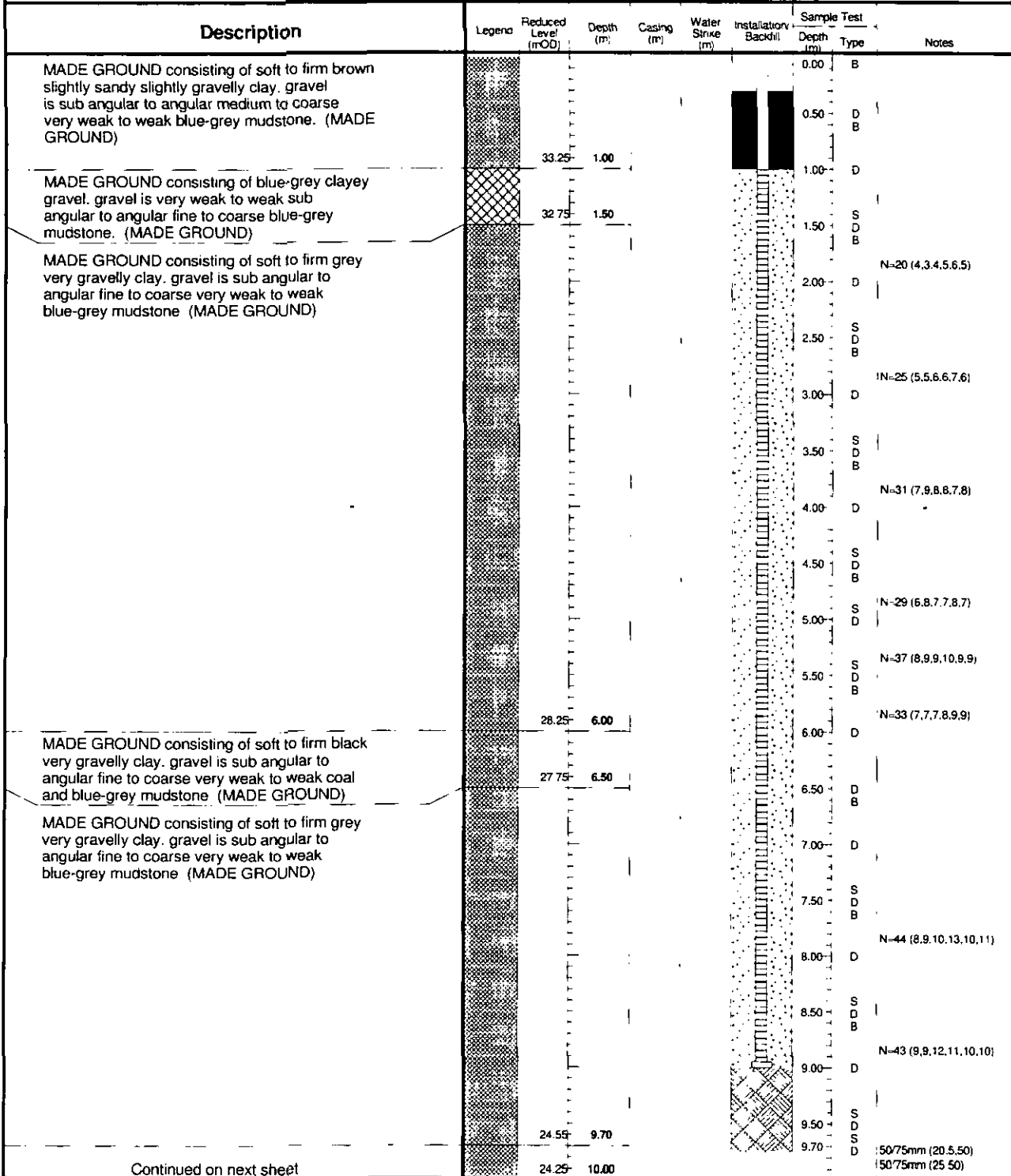
Project: A042741 - Grimethorpe

Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Cable Percussive

Co-ordinates: 441654.57E - 406334.47N
Ground Level: 34.25 mAOD

Start Date : 22/02/08
Finish Date : 22/02/08



Observations:

JOB NUMBER

Logged By: TCY

Checked By:

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
Sherwood Business Park, Annesley, Notts, NG15 0DR
Tel. 01623 684550 Fax. 01623 684551

Borehole Number **CP2**

Sheet 1+ of 1
Scale 1:50

Project: **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Cable Percussive**

Co-ordinates: 441654.57E - 406334.47N
Ground Level : 34.25 mAOD

Start Date : 22/02/08
Finish Date : 22/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
<p>MADE GROUND consisting of soft to firm black very gravelly clay. gravel is sub angular to angular fine to coarse very weak to weak coal and blue-grey mudstone. (MADE GROUND)</p> <p>Exploratory Hole complete at 10.00 m</p>									

Observations:

JOB NUMBER
Logged By : **TCY**
Checked By :
Figure No.: **FIG**



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
Sherwood Business Park, Annesley, Notts, NG15 0DR
Tel. 01623 684550 Fax. 01623 684551

Borehole Number **CP3**

Sheet 1 of 1
Scale 1:50

Project: A042741 - Grimethorpe

Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Cable Percussive

Co-ordinates: 441684.64E - 406426.60N
Ground Level: 33.29 mAOD

Start Date : 25/02/08
Finish Date : 25/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular medium to coarse very weak to weak blue-grey mudstone and rare coal. (MADE GROUND)		30.29	3.00				0.00	B	
							0.50	D B	
							1.00	D	
							1.50	D B	
							2.00	D	
							2.50	S D B	
MADE GROUND consisting of blue-grey clayey gravel. gravel is sub angular to angular fine to coarse blue-grey mudstone. (MADE GROUND)		29.79	3.50				3.00	D	N=27 (4,6,6,7,6,8)
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular medium to coarse very weak to weak blue-grey mudstone and rare coal. (MADE GROUND)		27.79	5.50				3.50	S D B	N=29 (5,7,6,7,8,8);
							4.00	D	
							4.50	S D B	
MADE GROUND consisting of blue-grey clayey gravel. gravel is sub angular to angular fine to coarse blue-grey mudstone. (MADE GROUND)		27.29	6.00				5.00	D	N=50 (12,13,17,12,16,5)
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular medium to coarse very weak to weak blue-grey mudstone and rare coal. (MADE GROUND)		26.99	6.30				5.50	S D B	50/225mm (15,10,16,18,16)
							6.00	D	
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular medium to coarse very weak to weak blue-grey mudstone and rare coal. (MADE GROUND)		26.74	6.55				6.30	S D	50/225mm (10,15,20,21,9)
							6.30	D	
MADE GROUND consisting of very weak sub angular to angular fine to coarse gravel of orange sandstone and grey mudstone. (MADE GROUND)									

Exploratory Hole complete at 6.70 m

Observations:

JOB NUMBER

Logged By : TCY

Checked By :

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
Sherwood Business Park, Annesley, Notts, NG15 0DR
Tel. 01623 684550 Fax. 01623 684551

Borehole Number **CP4**

Sheet 1 of 1
Scale 1:50

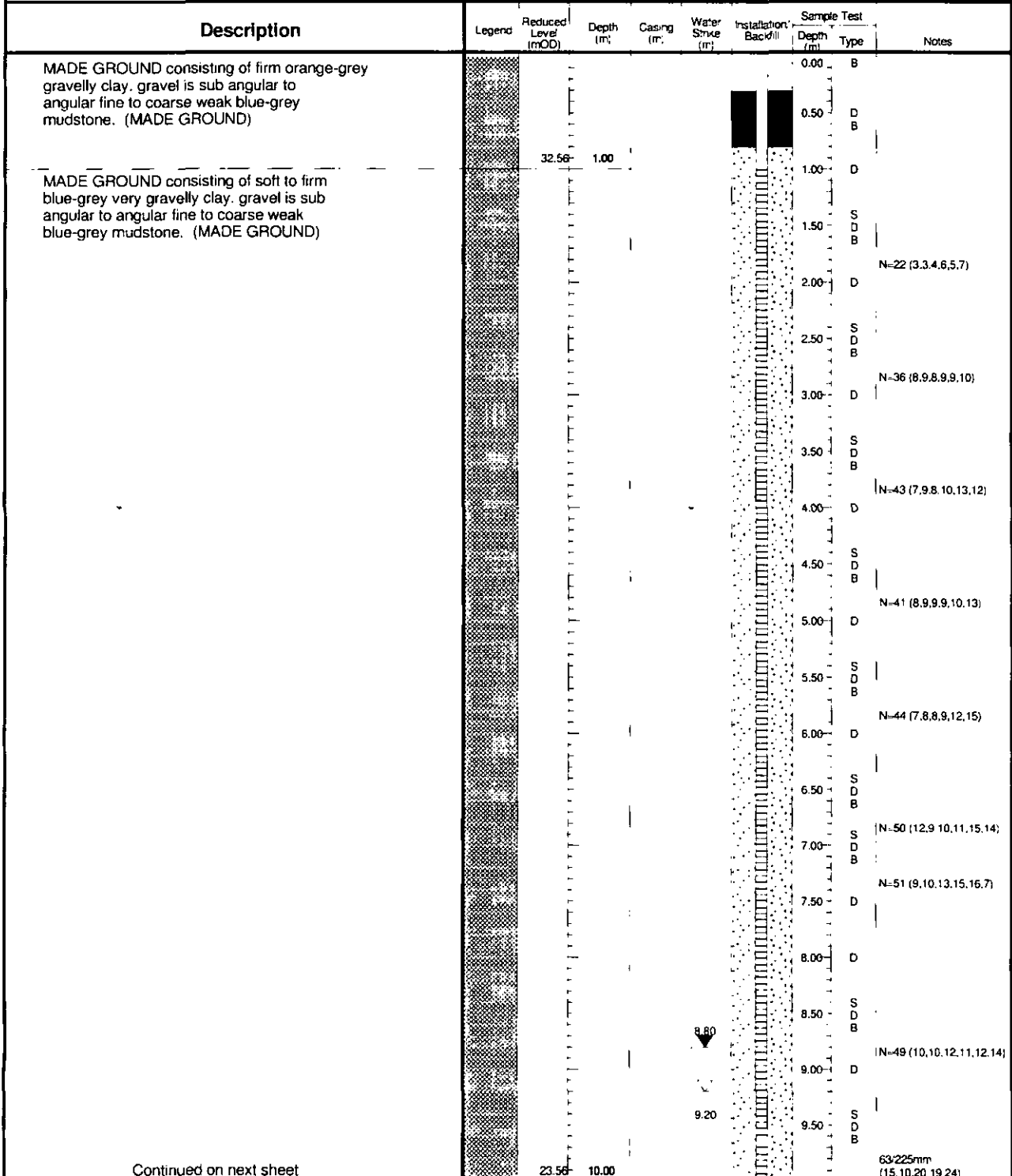
Project: **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Cable Percussive**

Co-ordinates: 441740.54E - 406472.80N
Ground Level: 33.56 mAOD

Start Date : 25/02/08
Finish Date 25/02/08



Continued on next sheet

23.56 10.00

8.80
9.20

63/225mm
(15,10,20,19,24)

Observations:

JOB NUMBER

Logged By : TCY

Checked By :

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **CP4**

Sheet 1+ of 1
 Scale 1:50

Project: **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Cable Percussive**

Co-ordinates: 441740.54E - 406472.80N
 Ground Level : 33.56 mAOD

Start Date : 25/02/08
 Finish Date : 25/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of grey gravel. gravel is sub angular to angular fine to coarse sandstone. (MADE GROUND) MADE GROUND consisting of grey gravel. gravel is sub angular to angular fine to coarse sandstone. (MADE GROUND) Exploratory Hole complete at 10.00 m							10.00	D	

Observations:

JOB NUMBER
 Logged By : TCY
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **CP5**

Sheet 1 of 1
 Scale 1:50

Project: **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Cable Percussive**

Co-ordinates: 441733.34E - 406679.68N
 Ground Level: 33.72 mAOD

Start Date : -
 Finish Date :-

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/Backfill	Sample Test Depth (m)	Type	Notes
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular fine to coarse weak blue-grey mudstone with rare cobbles. (MADE GROUND)	[Pattern]						0.50	D B	
							1.00	D B	
		32.22	1.50				1.50	S D B	
MADE GROUND consisting of grey sandy gravel. gravel is very weak sub angular to angular fine to coarse gravel of grey sandstone. (MADE GROUND)	[Pattern]						2.00	D	N=20 (5.5,4.5,6.5)
		31.72	2.00						
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular fine to coarse weak blue-grey mudstone with rare cobbles. (MADE GROUND)	[Pattern]						2.50	S D B	
							3.00	D	N=30 (6.7,6.8,7.9)
		29.72	4.00						
MADE GROUND consisting of grey slightly clayey gravel. gravel is very weak sub angular to angular fine to coarse gravel of grey mudstone. (MADE GROUND)	[Pattern]						3.50	S D B	
		29.22	4.50				4.00	D	N=28 (5.6,6.7,8.7)
							4.50	S D B	
MADE GROUND consisting of soft to firm blue-grey very gravelly clay. gravel is sub angular to angular fine to coarse weak blue-grey mudstone with rare cobbles. (MADE GROUND)	[Pattern]						5.00	D	N=31 (7.6,7.9,7.8)
		27.72	6.00				5.50	S D B	
		27.52	6.20				6.00	S D B	N=33 (7.7,9.8,8.8)
MADE GROUND consisting of soft to firm blue-grey sandy gravelly clay. gravel is sub angular to angular fine to coarse weak blue-grey sandstone (MADE GROUND)	[Pattern]						6.20	D	150/75mm (25.50)
Exploratory Hole complete at 6.55 m									

Observations:

JOB NUMBER

Logged By :
 Checked By :

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations.
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684 551

Probe Number **DP2**

Sheet 1 of 2

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: **33mAOD**

Date -

Depth (m)	Readings										Blows / 100mm	5	10	15	20	25	30	35	40	45	Depth	Sample	Remarks	Interpretation	Torque (Nm)
	2	3	4	5	6	7	8	9	10	11															
0.2	2	2	2	2	2	2	2	2	2	2	2														
0.6	9	8	6	8	8	8	8	8	8	8	8														
1.0	6	5	7	7	7	7	7	7	7	7	7														
1.4	7	7	7	7	7	7	7	7	7	7	7														
1.8	9	9	7	6	9	9	9	9	9	9	9														
2.2	7	3	4	6	8	8	8	8	8	8	8														
2.6	6	4	10	15	14	14	14	14	14	14	14														
3.0	7	11	14	7	7	7	7	7	7	7	7														
3.4	5	4	4	5	6	6	6	6	6	6	6														
3.8	6	6	3	3	7	7	7	7	7	7	7														
4.2	8	15	20	14	9	9	9	9	9	9	9														
4.6	9	12	9	8	5	5	5	5	5	5	5														
5.0	7	8	8	9	10	10	10	10	10	10	10														
5.4	10	12	16	11	8	8	8	8	8	8	8														
5.8	8	12	17	13	13	13	13	13	13	13	13														
6.2	12	13	11	9	8	8	8	8	8	8	8														
6.6	6	8	6	7	8	8	8	8	8	8	8														
7.0	8	5	6	5	4	4	4	4	4	4	4														
7.4	4	8	7	7	7	7	7	7	7	7	7														
7.8	9	12	12	15	12	12	12	12	12	12	12														
8.2	9	12	12	15	12	12	12	12	12	12	12														

Continued next sheet

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm Sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations.
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 Tel. 01623 684550 Fax. 01623 684 551

Probe Number **DP2**

Sheet 2 of 2

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: **33mAOD**

Date -

Depth (m)	Readings Blows / 100mm	5 10 15 20 25 30 35 40 45										Depth	Sample	Remarks	Interpretation	Torque (Nm)	
12.0	10														End of Window Sample at 11.10 m		
13.0	10																
14.0	11																
15.0	20																
16.0	23																
17.0																	
18.0																	
19.0																	

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm Sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



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Probe Number **DP3**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: **33mAOD**

Date -

Depth (m)	Readings										Depth	Sample	Remarks	Interpretation	Torque (Nm)
	Blows / 100mm														
0	1	1	0											End of Window Sample at 4.30 m	
1	1	1	0												
1.0	0	0	2	4											
4	4	4	4	4											
2.0	3	2	2	2											
1	1	0	0	1											
3.0	1	3	3	2											
2	2	2	1	1											
4.0	2	1	0	50											
5.0															
6.0															
7.0															
8.0															
9.0															

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



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Probe Number **DP4**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: 35mAOD

Date -

Depth (m)	Readings										Depth	Sample	Remarks	Interpretation	Torque (Nm)	
	Blows / 100mm															
1.0	0	0	0	0	0	0	0	0	0	0	1			End of Window Sample at 5.10 m		
0.0	0	0	0	0	0	0	0	0	0	0						
1.0	0	1	0	0	0	0	0	0	0	0						
0.0	0	0	0	0	0	0	0	0	0	0						
2.0	1	1	4	3	3	3	3	3	3	3						
4.0	3	3	6	9	6	6	6	6	6	6						
3.0	9	11	16	11	8	8	8	8	8	8						
8.0	9	9	8	7	6	6	6	6	6	6						
4.0	8	20	9	9	16	16	16	16	16	16						
12.0	11	14	12	12	12	12	12	12	12	12						
5.0	12	32														
6.0																
7.0																
8.0																
9.0																

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: DPSH
 Cone Size: 15cm sq

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: FIG



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Probe Number **DP5**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: **33mAOD**

Date -

Depth (m)	Readings															Depth	Sample	Remarks	Interpretation	Torque (Nm)
	Blows / 100mm		5	10	15	20	25	30	35	40	45									
1	1	1																	End of Window Sample at 2.60 m	
	1	2																		
1	2	1																		
1.0	1	0																		
	1	2																		
	2	2																		
8	9	8																		
	8	8																		
2.0	4	5																		
	5	3																		
	3	3																		
	3	3																		
	50																			
3.0																				
4.0																				
5.0																				
6.0																				
7.0																				
8.0																				
9.0																				

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



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Probe Number **DP6**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: **33mAOD**

Date -

Depth (m)	Readings										Depth	Sample	Remarks	Interpretation	Torque (Nm)	
	Blows / 100mm															
0.1	1	1	1	1							0.1					
0.2	1	1	2	2							0.2					
0.3	4	6	4	6							0.3					
0.4	11	8	4	6							0.4					
0.5	4	4	4	5							0.5					
0.6	5	6	4	4							0.6					
0.7	5	8	12	5							0.7					
0.8	8	8	8	8							0.8					
0.9	8	8	11	8							0.9					
1.0	9	12	12	12							1.0					
1.1	12	6	8	12							1.1					
1.2	11	8	13	8							1.2					
1.3	11	8	12	10							1.3					
1.4	50			10							1.4					

End of Window Sample at 5.00 m

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



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Probe Number **DP6A**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: **34m AOD**

Date -

Depth (m)	Readings Blows / 100mm	5 10 15 20 25 30 35 40 45										Depth	Sample	Remarks	Interpretation	Torque (Nm)
0.0															End of Window Sample at 0.00 m	
1.0																
2.0																
3.0																
4.0																
5.0																
6.0																
7.0																
8.0																
9.0																

Remarks:

Fall Height:

Hammer Wt:

Probe Type:

Cone Size: 15cm sq

JOB NUMBER

Logged by:

Checked by:

FIGURE NO:

FIG



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Probe Number **DP9**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: **33mAOD**

Date -

Depth (m)	Readings										Depth	Sample	Remarks	Interpretation	Torque (Nm)
	Blows / 100mm														
0.0	1	2	3											End of Window Sample at 3.50 m	
0.3	3	2	3												
0.5	5	5	9												
0.7	8	7	31												
1.0	10	8	12												
1.3	7	6	16												
1.5	10	5	15												
1.7	10	5	11												
2.0	25	17	15												
2.3															
2.5															
2.7															
3.0															
3.3															
3.5															
3.7															
4.0															
4.3															
4.5															
4.7															
5.0															
5.3															
5.5															
5.7															
6.0															
6.3															
6.5															
6.7															
7.0															
7.3															
7.5															
7.7															
8.0															
8.3															
8.5															
8.7															
9.0															

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



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Probe Number **DP11**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: 34mAOD

Date -

Depth (m)	Readings Blows / 100mm	5 10 15 20 25 30 35 40 45										Depth Sample	Remarks	Interpretation	Torque (Nm)
0	2													End of Window Sample at 3.50 m	
0.2	2														
0.4	2														
0.6	2														
0.8	2														
1.0	28														
1.2	18														
1.4	8														
1.6	15														
1.8	23														
2.0	4														
2.2	4														
2.4	4														
2.6	8														
2.8	9														
3.0	10														
3.2	8														
3.4	6														
3.6	18														
3.8	13														
4.0	12														
4.2	9														
4.4	7														
4.6	13														
4.8	9														
5.0	12														
5.2	9														
5.4	38														
5.6															
5.8															
6.0															
6.2															
6.4															
6.6															
6.8															
7.0															
7.2															
7.4															
7.6															
7.8															
8.0															
8.2															
8.4															
8.6															
8.8															
9.0															

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



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Probe Number **DP12**

Sheet 1 of 1

Scale 1:50

Project: **A042741 - Grimethorpe**

Client: **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Ground Level: 33mAOD

Date -

Depth (m)	Readings		Blows / 100mm											Depth	Sample	Remarks	Interpretation	Torque (Nm)			
	Blows / 100mm	Blows / 100mm	5	10	15	20	25	30	35	40	45										
0	1	1																			
0.4	4	2	4																		
0.8	4	3	2																		
1.2	5	2	2																		
1.6	6	8	8																		
2.0	11	8	14																		
2.4	6	5	5																		
2.8	7	8	8																		
3.2	8	7	8																		
3.6	10	10	7																		
4.0	5	7	7																		
4.4	11	11	11																		
4.8	11	12	11																		
5.2	11	11	11																		
5.6	9	9	9																		
6.0	13	11	11																		
6.4	11	11	15																		
6.8																					
7.2																					
7.6																					
8.0																					
8.4																					
8.8																					
9.2																					
9.6																					
10.0																					

End of Window Sample at 4.50 m

Remarks:

Fall Height: -
 Hammer Wt: -
 Probe Type: **DPSH**
 Cone Size: **15cm sq**

JOB NUMBER
 Logged by:
 Checked by:
 FIGURE NO: **FIG**



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Trial Pit Number **TP1**
 Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe** Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: Co-ordinates: **441520E - 406445N** Start Date: **13/02/08**
 Ground Level: **31.27 mAOB** Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of soft to firm mottled light brown and grey sandy gravelly clay. gravel is angular to sub-angular light brown and dark grey mudstone ()		30.17	1.10			0.20 -	A	
						0.40 -	B	
MADE GROUND consisting of mottled light brown and blue-grey very gravelly clay. gravel is angular to sub-angular dark grey-blue mudstone, rare to some boulders of light brown and grey sandy thinly bedded mudstone ()		28.27	3.00			1.20 -	B	
						1.40 -		
Trial Pit completed at 3.00m bgl						2.40 -	B	
						2.60 -		

Stability: Groundwater Observations: Other Observations:	Pit Dimensions: Length: 3.0m Width: 0.7m Orientation:	JOB NUMBER
		Logged By : Checked By : CA
		FIG. NO.



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Trial Pit Number **TP2**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: **441571E - 406395N**
 Ground Level: **32.26 mAOD**

Start Date: **13/02/08**
 Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of soft to firm mottled light brown and grey sandy gravelly clay. gravel is angular to sub-angular light brown and dark grey mudstone ()						0.20 - 0.40 0.20 - 0.40	A B	
		31.26	1.00					
MADE GROUND consisting of light brown and grey sandy very clayey gravel. Gravel is angular to sub-angular grey mudstone and sandy brown mudstone. rare sub-angular boulder of mudstone ()						1.40 - 1.60	B	
						2.50 - 2.80	B	
		29.06	3.20					
----- Trial Pit completed at 3.20m bgl								

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 2.8m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : CA
 FIG. NO.



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Trial Pit Number **TP3**

Sheet 1 of 1
 Scale 1:25

Project :A042741 - Grimethorpe

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: JCB

Co-ordinates: 441623E - 406346N
 Ground Level: 33.13 mAOD

Start Date: 13/02/08
 Finish Date: 13/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of soft to firm mottled light brown and grey sandy gravelly clay. gravel is angular to sub-angular light brown and dark grey mudstone ()		31.93	1.20			0.20 - 0.40 0.20 - 0.40	A B	
MADE GROUND consisting of dark blue-grey clayey gravel. gravel is sub angular to angular dark blue-grey mudstone and occasionally orange brown sandy mudstone. Some to many cobbles () @1.2mbgl in E end of pit very large boulder? grey mudstone boulder prevented further excavation at E end		29.93	3.20			1.20 - 1.40 2.40 - 2.60	B B	
----- Trial Pit completed at 3.20m bgl								

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 3.0m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : CA
 FIG. NO.



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Trial Pit Number **TP4**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: **441624E - 406448N**
 Ground Level: **33.05 mAOD**

Start Date: **13/02/08**
 Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of light brown and mottled grey very gravelly clay. Gravel is sub-angular to angular mudstone. rare coal fragments ()		32.30	0.75			0.20 -	A	
						0.40	B	
MADE GROUND consisting of blue-grey slightly clayey gravel to boulders. Gravel is blue-grey mudstone, some to many boulders ()						1.40 -	B	
						1.60		
						2.40 -	B	
						2.60		
		30.05	3.00					

Trial Pit completed at 3.00m bgl

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 2.9m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : **CA**
 FIG. NO.



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Trial Pit Number **TP5**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: **441667E - 406400N**
 Ground Level: **33.38 mAOD**

Start Date: **13/02/08**
 Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of mottled grey and light brown sandy gravelly clay. Gravel is angular to sub-angular grey-blue mudstone. ()		32.83	0.55			0.20 - 0.30 0.20 - 0.30	A B	
MADE GROUND consisting of light grey-blue clayey gravel. gravel is angular to sub-angular grey-blue mudstone. Rare to some boulder of grey-blue mudstone. ()						1.20 - 1.50	B	
						2.20 - 2.40	B	
Trial Pit completed at 2.65m bgl		30.73	2.65					

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 2.9m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : 2.65
 FIG. NO.



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Trial Pit Number **TP6**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: 441687E - 406474N
 Ground Level: 33.23 mAOD

Start Date: 13/02/08
 Finish Date: 13/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of light brown and mottled grey very gravelly clay. Gravel is sub-angular to angular mudstone. rare coal fragments ()		32.58	0.65			0.20 - 0.40	A	
MADE GROUND consisting of blue-grey slightly clayey slightly sandy gravel to boulders. Gravel is blue-grey mudstone, some to many boulders ()						1.40 - 1.60	B	
						2.20 - 2.40	B	
----- Trial Pit completed at 3.00m bgl		30.23	3.00					

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 3.0m
 Width: 0.7m
 Orientation:

JOB NUMBER

Logged By :
 Checked By : CA

FIG. NO.



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Trial Pit Number **TP7**

Sheet 1 of 1
 Scale 1:25

Project : A042741 - Grimethorpe			Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP					
Method: JCB			Co-ordinates: 441733E - 406425N		Start Date: 13/02/08			
			Ground Level: 33.79 mAOD		Finish Date: 13/02/08			
Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of mottled grey and light brown very sandy gravelly clay. Gravel is sub-angular grey mudstone ()		33.24	0.55			0.20 - 0.30 0.20 - 0.40	A B	
MADE GROUND consisting of light grey-blue clayey gravel. gravel is angular to sub-angular grey-blue mudstone. Rare to some boulder of grey-blue mudstone. Pit sides unstable ()						1.20 - 1.40	B	
		31.19	2.60			2.40 - 2.60	B	
----- Trial Pit completed at 2.60m bgl								
Stability: Groundwater Observations: Other Observations:				Pit Dimensions: Length: 2.8m Width: 0.7m Orientation:		JOB NUMBER Logged By : Checked By : CA FIG. NO.		



WHITE YOUNG GREEN ENVIRONMENTAL

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Trial Pit Number **TP7A**

Sheet 1 of 1
Scale 1:25

Project :A042741 - Grimethorpe

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Co-ordinates: 441702E - 406401N
Ground Level: 33.64 mAOD

Start Date: -
Finish Date: -

Description

Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
					Depth (m)	Type	

Trial Pit completed at 0.00m bgl

Stability:
Groundwater Observations:
Other Observations:

Pit Dimensions:
Length: -
Width: -
Orientation:

JOB NUMBER
Logged By :
Checked By :

FIG. NO.



WHITE YOUNG GREEN ENVIRONMENTAL

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Trial Pit Number **TP8**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: **441721E - 406535N**
 Ground Level : **36.26 mAOOD**

Start Date: **13/02/08**
 Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of firm to stiff light brown and mottled grey very sandy very gravelly clay. gravel is angular to sub-angular orange brown sandy mudstone. rare to some coal fragments, rare to some sandy mudstone cobbles to boulders ()						0.30 -	A	
						0.50		
Trial Pit completed at 3.20m bgl		33.06	3.20					

Stability:
 Groundwater Observations:
 Other Observations: 1. TP excavated on top of bund ~3-4m high

Pit Dimensions:
 Length: 3.1m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : CA

FIG. NO.




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Trial Pit Number **TP9**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe** Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB** Co-ordinates: **441746E - 406497N** Start Date: **13/02/08**
 Ground Level: **33.37 mAOB** Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of light brown and mottled grey very gravelly clay. Gravel is sub-angular to angular mudstone. rare coal fragments ()		32.62	0.75					
MADE GROUND consisting of blue-grey slightly clayey gravel to boulders. Gravel is blue-grey mudstone, some to many boulders ()								
Trial Pit completed at 2.90m bgl		30.47	2.90					

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 3.1m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : CA

FIG. NO.



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Trial Pit Number **TP10**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe** Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB** Co-ordinates: **441755E - 406573N** Start Date: **13/02/08**
 Ground Level: **33.66 mAOD** Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of firm mottled light brown and grey sandy very gravelly clay. Gravel is angular to sub-angular brown sandy mudstone and rare to some coal fragments ()		32.96	0.70			0.20 - 0.30 0.20 - 0.30	A B	
MADE GROUND consisting of dark blue-grey slightly clayey gravel. Gravel is angular to sub-angular blue-grey mudstone, some to many blue-grey mudstone cobbles ()		32.16	1.50			1.20 - 1.40	B	
----- Trial Pit completed at 1.50m bgl								

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 3.1m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : **CA**
 FIG. NO.



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Trial Pit Number **TP11**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe** Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB** Co-ordinates: **441745E - 406651N** Start Date: **13/02/08**
 Ground Level: **33.84 mAOD** Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of firm mottled light brown and grey sandy very gravelly clay. Gravel is angular to sub-angular brown sandy mudstone and rare to some coal fragments ()		33.09	0.75			0.20 - 0.30 0.20 - 0.30	A B	
MADE GROUND consisting of dark blue-grey slightly clayey gravel. Gravel is angular to sub-angular blue-grey mudstone, some to many blue-grey mudstone cobbles ()		32.64	1.20			1.00 - 1.20	B	
MADE GROUND consisting of light orange-brown slightly clayey very sandy gravel. Gravel is angular to sub-angular sandy orange boren thinly laminated mudstone ()		32.29	1.55					
MADE GROUND consisting of dark blue-grey slightly clayey gravel. Gravel is angular to sub-angular blue-grey mudstone, some to many blue-grey mudstone cobbles ()		30.94	2.90			2.20 - 2.40	B	
----- Trial Pit completed at 2.90m bgl								

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 4.0m
 Width: 0.7m
 Orientation:

JOB NUMBER
 Logged By :
 Checked By : **CA**
 FIG. NO.



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Trial Pit Number **TP12**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: **441724E - 406481N**
 Ground Level : **33.34 mAOD**

Start Date: **13/02/08**
 Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of light brown and mottled grey very gravelly clay. Gravel is sub-angular to angular mudstone. rare coal fragments ()		32.99	0.35			0.10 - 0.30 0.10 - 0.30	A B	
MADE GROUND consisting of blue-grey slightly clayey gravel to boulders. Gravel is blue-grey mudstone, some to many boulders ()						1.30 - 1.50	B	
						2.40 - 2.60	B	
----- Trial Pit completed at 3.10m bgl		30.24	3.10					

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 2.9m
 Width: 0.7m
 Orientation:

JOB NUMBER

Logged By :
 Checked By : CA

FIG. NO.



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Trial Pit Number **TP13**

Sheet 1 of 1
 Scale 1:25

Project : A042741 - Grimethorpe				Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP				
Method: JCB				Co-ordinates: 441677E - 406443N		Start Date: 13/02/08		
				Ground Level: 33.20 mAOD		Finish Date: 13/02/08		
Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of light brown and mottled grey very gravelly clay. Gravel is sub-angular to angular mudstone, rare coal fragments ()		32.45	0.75			0.20 - 0.40	A	
						0.20 - 0.40	B	
MADE GROUND consisting of blue-grey slightly clayey gravel to boulders. Gravel is blue-grey mudstone, some to many boulders ()						1.40 - 1.60	B	
						2.40 - 2.60	B	
----- Trial Pit completed at 2.60m bgl		30.60	2.60					
Stability: Groundwater Observations: Other Observations: 1. TP stopped at 2.6mbgl as compacted mudstone too hard				Pit Dimensions: Length: 3.1m Width: 0.7m Orientation:		JOB NUMBER Logged By : Checked By : CA FIG. NO.		



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Trial Pit Number **TP14**

Sheet 1 of 1
Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: 441569E - 406452N
Ground Level: 32.28 m AOD

Start Date: 13/02/08
Finish Date: 13/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of light brown and mottled grey very gravelly clay. Gravel is sub-angular to angular mudstone. rare coal fragments ()		31.93	0.35			0.10 - 0.15	A B	
MADE GROUND consisting of blue-grey slightly clayey gravel to boulders. Gravel is blue-grey mudstone, some to many boulders ()						1.50 - 1.70	B	
						2.30 - 2.50	B	
----- Trial Pit completed at 3.10m bgl		29.18	3.10					

Stability:
Groundwater Observations:
Other Observations:

Pit Dimensions:
Length: 3.0m
Width: 0.7m
Orientation:

JOB NUMBER
Logged By :
Checked By : CA
FIG. NO.



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Trial Pit Number **TP15**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe** Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB** Co-ordinates: **441626E - 406402N** Start Date: **13/02/08**
 Ground Level: **33.44 mAOB** Finish Date: **13/02/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of mottled grey and light brown sandy gravelly clay. Gravel is angular to sub-angular grey-blue mudstone ()		33.04	0.40			0.20 - 0.30	A B	
MADE GROUND consisting of light grey-blue clayey gravel. gravel is angular to sub-angular grey-blue mudstone. Rare to some boulder of grey-blue mudstone. Pit sides unstable ()						1.20 - 1.50	B	
						2.00 - 2.20	B	
----- Trial Pit completed at 2.30m bgl		31.14	2.30					

Stability: Groundwater Observations: Other Observations:	Pit Dimensions: Length: 3.0m Width: 0.7m Orientation:	JOB NUMBER Logged By : Checked By : FIG. NO.
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CA



WHITE YOUNG GREEN ENVIRONMENTAL

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Trial Pit Number **TP16**

Sheet 1 of 1
 Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB**

Co-ordinates: 441658E - 406353N
 Ground Level: 34.46 mAOD

Start Date: 13/02/08
 Finish Date: 13/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
MADE GROUND consisting of mottled grey and light brown sandy gravelly clay. Gravel is angular to sub-angular grey-blue mudstone ()		33.91	0.55			0.20 - 0.30 0.20 - 0.30	A B	
MADE GROUND consisting of light grey-blue clayey gravel. gravel is angular to sub-angular grey-blue mudstone. Rare to some boulder of grey-blue mudstone. Pit sides unstable. Rare black mudstone boulder and rare coal / black mudstone fragments ()						1.10 - 1.40	B	
						2.10 - 2.30	B	
----- Trial Pit completed at 2.60m bgl		31.86	2.60					

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: 2.8m
 Width: 0.7m
 Orientation:

JOB NUMBER

Logged By :
 Checked By : CA

FIG. NO.



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Trial Pit Number **TP16A**

Sheet 1 of 1
Scale 1:25

Project : **A042741 - Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method:

Co-ordinates: 441645E - 408365N
Ground Level: 33.55 mAOD

Start Date: -
Finish Date: -

Description

Legend	Reduced Level (mAOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
					Depth (m)	Type	

Trial Pit completed at 0.00m bgl

Stability:
Groundwater Observations:
Other Observations:

Pit Dimensions:
Length: -
Width: -
Orientation:

JOB NUMBER

Logged By :
Checked By :

FIG. NO.



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Trial Pit Number **TT1**

Sheet 1 of 1
Scale 1:25

Project : **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB 3CX**

Co-ordinates: 441610E - 406378N
Ground Level :

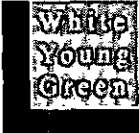
Start Date: 02/05/08
Finish Date: 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
Grass over brown clayey TOPSOIL (TOPSOIL)			0.20					
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey and occasional brown sandy mudstone. Some to many cobbles and occasional boulders with depth. (MADE GROUND)								
Trial Pit completed at 4.90m bgl			4.90					

Stability:
Groundwater Observations:
Other Observations:

Pit Dimensions:
Length: -
Width: -
Orientation:

JOB NUMBER **A042741**
Logged By :
Checked By :
FIG. NO.



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Trial Pit Number **TT2**

Sheet 1 of 1
 Scale 1:25

Project : **Grimethorpe** Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB 3CX** Co-ordinates: **441532E - 406461N** Start Date: **02/05/08**
 Ground Level: Finish Date: **02/05/08**

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
Grass over brown clayey TOPSOIL (TOPSOIL)			0.20					
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey and occasional brown sandy mudstone. Some to many cobbles and occasional boulders with depth. (MADE GROUND)								
Trial Pit completed at 4.70m bgl			4.70					

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: -
 Width: -
 Orientation:

JOB NUMBER **A042741**
 Logged By :
 Checked By :
 FIG. NO.



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Trial Pit Number **TT3**

Sheet 1 of 1
 Scale 1:25

Project : **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **JCB 3CX**

Co-ordinates: 441737E - 406625N
 Ground Level :

Start Date: 02/05/08
 Finish Date: 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Backfill	Sample Test		Notes
						Depth (m)	Type	
Grass over brown clayey TOPSOIL (TOPSOIL)			0.20					
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey and occasional brown sandy mudstone. Some to many cobbles and occasional boulders with depth. (MADE GROUND)								
----- Trial Pit completed at 4.50m bgl			4.50					

Stability:
 Groundwater Observations:
 Other Observations:

Pit Dimensions:
 Length: -
 Width: -
 Orientation:

JOB NUMBER A042741
 Logged By :
 Checked By :
 FIG. NO.



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Borehole Number **RO1**

Sheet 1 of 1
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441621.00E - 406348.00N
 Ground Level :

Start Date : 01/05/08
 Finish Date : 01/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular gray mudstone. (MADE GROUND)									
Exploratory Hole complete at 5.10 m			5.10						

Observations:

JOB NUMBER A042741

Logged By :

Checked By :

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

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Borehole Number **RO2**

Sheet 1 of 1
Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441585.00E - 406386.00N
Ground Level :

Start Date : 01/02/08
Finish Date : 01/02/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 5.00 m			5.00						

Observations:

JOB NUMBER A042741

Logged By :

Checked By :

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

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Borehole Number **RO3**

Sheet 1 of 1
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441601.00E - 406475.00N
 Ground Level :

Start Date : //
 Finish Date : //

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)									
Exploratory Hole complete at 8.40 m			8.40						

Observations:

JOB NUMBER **A042741**
 Logged By :
 Checked By :
 Figure No.: **FIG**



WHITE YOUNG GREEN ENVIRONMENTAL

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Borehole Number **RO4**

Sheet 1 of 1
 Scale 1:50

Project: Grimethorpe

Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Lorry mounted Commachio Rotary Rig

Co-ordinates: 441617.00E - 406423.00N
 Ground Level :

Start Date : 01/05/08
 Finish Date : 01/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)									
Exploratory Hole complete at 8.50 m			8.50						

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

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Borehole Number **RO5**

Sheet 1 of 1
 Scale 1:50

Project: Grimethorpe

Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Lorry mounted Commachio Rotary Rig

Co-ordinates: 441592.00E - 406423.00N
 Ground Level :

Start Date : 01/05/08
 Finish Date : 01/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 5.10 m			5.10						

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



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Borehole Number **RO6**

Sheet 1 of 1
 Scale 1:50

Project: Grimethorpe

Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Lorry mounted Commachio Rotary Rig

Co-ordinates: 441640.00E - 406419.00N
 Ground Level :

Start Date : 01/05/08
 Finish Date : 01/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 5.40 m			5.40						

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

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Borehole Number **RO7**

Sheet 1 of 2
Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441653.00E - 406488.00N
Ground Level :

Start Date : 01/05/08
Finish Date : 01/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)									

Continued on next sheet

Observations:

JOB NUMBER **A042741**

Logged By :

Checked By :

Figure No.: **FIG**



WHITE YOUNG GREEN ENVIRONMENTAL

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Borehole Number **RO7**

Sheet 2 of 2
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441653.00E - 406488.00N
 Ground Level :

Start Date : 01/05/08
 Finish Date : 01/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)									
Exploratory Hole complete at 12.40 m			12.40						

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

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Borehole Number **RO8**

Sheet 1 of 1
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441664.00E - 406440.00N
 Ground Level :

Start Date : 01/05/08
 Finish Date : 01/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 6.10 m			6.10						

Observations:

JOB NUMBER **A042741**
 Logged By :
 Checked By :
 Figure No.: **FIG**



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Borehole
 Number **RO9**

Sheet 1 of 1
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441681.00E - 406474.00N
 Ground Level :

Start Date : 01/05/08
 Finish Date : 01/05/08

Description	Legend	Reduced Level (MOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 5.30 m			5.30						

Observations:

JOB NUMBER **A042741**
 Logged By :
 Checked By :
 Figure No.: **FIG**



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **RO10**

Sheet 1 of 1
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441710.00E - 406472.00N
 Ground Level :

Start Date : 02/05/08
 Finish Date : 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 6.60 m			6.60						

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
Sherwood Business Park, Annesley, Notts, NG15 0DR
Tel. 01623 684550 Fax. 01623 684551

Borehole Number **RO11**

Sheet 1 of 1
Scale 1:50

Project: Grimethorpe

Client: WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Lorry mounted Commachio Rotary Rig

Co-ordinates: 441741.00E - 406482.00N
Ground Level :

Start Date : 02/05/08
Finish Date : 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/ Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 4.70 m			4.70						

Observations:

JOB NUMBER A042741

Logged By :

Checked By :

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **RO12**

Sheet 1 of 2
 Scale 1:50

Project: Grimethorpe

Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Lorry mounted Commachio Rotary Rig

Co-ordinates: 441705.00E - 406521.00N
 Ground Level :

Start Date : 02/05/08
 Finish Date : 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)									

Continued on next sheet

Observations:

JOB NUMBER A042741

Logged By :

Checked By :

Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL
 Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **RO12**

Sheet 2 of 2
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441705.00E - 406521.00N
 Ground Level :

Start Date : 02/05/08
 Finish Date : 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)			12.10						
Exploratory Hole complete at 12.10 m									

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **RO13**

Sheet 1 of 2
 Scale 1:50

Project: Grimethorpe

Client : WILLIAMS SAUNDERS PARTNERSHIPS LLP

Method: Lorry mounted Commachio Rotary Rig

Co-ordinates: 441744.00E - 406589.00N
 Ground Level :

Start Date : 02/05/08
 Finish Date : 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)									

Continued on next sheet

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **RO13**

Sheet 2 of 2
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441744.00E - 406589.00N
 Ground Level :

Start Date : 02/05/08
 Finish Date : 02/05/08

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone with some brown grey sandy mudstone with depth. (MADE GROUND)									
Exploratory Hole complete at 13.80 m			13.80						

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigations
 Sherwood Business Park, Annesley, Notts, NG15 0DR
 Tel. 01623 684550 Fax. 01623 684551

Borehole Number **RO14**

Sheet 1 of 1
 Scale 1:50

Project: **Grimethorpe**

Client : **WILLIAMS SAUNDERS PARTNERSHIPS LLP**

Method: **Lorry mounted Commachio Rotary Rig**

Co-ordinates: 441759.00E - 406650.00N
 Ground Level :

Start Date : 02/05/08
 Finish Date : 02/05/08

Description	Legend	Reduced Level (MOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation/Backfill	Sample Test		Notes
							Depth (m)	Type	
MADE GROUND consisting of soft to firm grey brown sandy gravelly clay. Gravel is angular to subangular grey mudstone. (MADE GROUND)									
Exploratory Hole complete at 4.90 m			4.90						

Observations:

JOB NUMBER A042741
 Logged By :
 Checked By :
 Figure No.: FIG

**APPENDIX C:
GEOCHEMICAL TESTING REPORTS**

L 499594 White Young Green: Grimethorpe A42741

STL Laboratory Number	10461946	10461947	10461948	10461949	10461950	10461951	10461952	10461953			
Customer Sample Ref	TP1 0.20m	TP2 1.40m	TP3 0.20m	TP5 0.20m	TP6 0.20m	TP8 0.30m	TP10 1.20m	TP11 0.20m			
Analyte	Method	Units	Acc								
Stones BG 2.6/3.0	Stones	%	*	28	18	15	18	17	20	18	18
Moisture content at 30 C	33A	%	*	15	12	14	14	14	14	7.3	12
Arsenic as As, dry weight	30/30C	mg/kg		7.6	3.4	6.9	12	7.4	7	20	8.8
Boron as B, hot water sol dw	6	mg/kg		0.78	1.1	0.95	0.91	0.63	1.5	1.6	2.6
Cadmium as Cd, dry weight	30	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexavalent Chromium as dw	30B	mg/kg		0.2	0.34	0.13	0.2	0.13	0.13	0.3	0.16
Chromium as Cr, dry weight	30	mg/kg		29	31	30	29	30	29	34	28
Copper, as Dry Weight	30	mg/kg		30	33	30	31	34	33	37	29
Lead, as Dry Weight	30	mg/kg		26	27	23	26	25	23	23	26
Mercury as Hg, dry weight	30C	mg/kg		<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Nickel as Ni, dry weight	30	mg/kg		47	54	51	50	49	52	65	46
Selenium as Se, dry weight	30C	mg/kg		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Zinc as Zn, dry weight	30	mg/kg		97	120	100	110	100	100	99	95
Cyanide (Complex)	14	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyanide (Free)	14	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tot. Steam Dist. Monophenols	40A	mg/kg		<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Sulphate as SO4, Water Soluble	46	g/l		<0.060	<0.060	<0.060	0.067	0.062	<0.060	0.11	<0.060
pH	39	pH units		7.1	7.7	7.1	7.1	7.5	7.6	8.1	7.3
TPH (Total)	317	mg/kg		<59	<57	<58	<58	<58	<58	57	<57
naphthalene	YWP PAH	mg/kg	*	0.85	0.65	0.75	0.94	0.88	0.37	0.76	0.43
acenaphthylene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
acenaphthene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
fluorene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
phenanthrene	YWP PAH	mg/kg	*	0.24	0.29	0.2	0.35	0.27	0.11	0.5	0.11
anthracene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
fluoranthene	YWP PAH	mg/kg	*	0.26	0.18	0.25	0.13	<0.10	0.46	0.17	0.56
pyrene	YWP PAH	mg/kg	*	0.12	<0.10	<0.10	0.17	0.12	<0.10	0.15	<0.10
benzo(a)anthracene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.17	<0.10
chrysene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.1	<0.10
benzo(b)fluoranthene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	0.13	<0.10	<0.10	0.15	<0.10
benzo(k)fluoranthene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
benzo(a)pyrene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.13	<0.10
dibenzo(ah)anthracene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
benzo(ghi)perylene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	0.11	<0.10	<0.10	0.17	<0.10

Key

N/S - Not Scheduled

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

Acc = Accreditation codes: * = not UKAS accredited.

L 499594 White Young Green: Grimethorpe A42741

STL Laboratory Number				10461946	10461947	10461948	10461949	10461950	10461951	10461952	10461953
Customer Sample Ref				TP1 0.20m	TP2 1.40m	TP3 0.20m	TP5 0.20m	TP6 0.20m	TP8 0.30m	TP10 1.20m	TP11 0.20m
Analyte	Method	Units	Acc								
indeno(123cd)pyrene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PAH (Total)	YWP PAH	mg/kg	*	1.5	1.1	1.2	1.8	1.3	<1.0	2.3	1.1

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L 499594 White Young Green: Grimethorpe A42741

STL Laboratory Number			10461954	10461955	10461956	
Customer Sample Ref			TP13 0.20m	TP15 0.20m	TP16 1.10m	
Analyte	Method	Units	Acc			
Stones BG 2.6/3.0	Stones	%	*	16	17	24
Moisture content at 30 C	33A	%	*	16	14	7.4
Arsenic as As, dry weight	30/30C	mg/kg		9	8.6	11
Boron as B, hot water sol dw	6	mg/kg		1.4	1.7	0.81
Cadmium as Cd, dry weight	30	mg/kg		<0.50	<0.50	<0.50
Hexavalent Chromium as dw	30B	mg/kg		0.16	0.16	0.26
Chromium as Cr, dry weight	30	mg/kg		29	31	28
Copper, as Dry Weight	30	mg/kg		34	36	39
Lead, as Dry Weight	30	mg/kg		29	27	36
Mercury as Hg, dry weight	30C	mg/kg		<0.25	<0.25	<0.25
Nickel as Ni, dry weight	30	mg/kg		46	58	55
Selenium as Se, dry weight	30C	mg/kg		<0.30	<0.30	0.38
Zinc as Zn, dry weight	30	mg/kg		95	110	100
Cyanide (Complex)	14	mg/kg		<5.0	<5.0	<5.0
Cyanide (Free)	14	mg/kg		<5.0	<5.0	<5.0
Tot. Steam Dist. Monophenols	40A	mg/kg		<0.75	<0.75	<0.75
Sulphate as SO4, Water Soluble	46	g/l		0.07	<0.060	0.26
pH	39	pH units		6.8	7.6	7.9
TPH (Total)	317	mg/kg		<60	<58	<54
naphthalene	YWP PAH	mg/kg	*	0.68	0.55	0.41
acenaphthylene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
acenaphthene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
fluorene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
phenanthrene	YWP PAH	mg/kg	*	0.34	0.13	0.29
anthracene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
fluoranthene	YWP PAH	mg/kg	*	0.18	<0.10	0.41
pyrene	YWP PAH	mg/kg	*	0.16	<0.10	<0.10
benzo(a)anthracene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
chrysene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
benzo(b)fluoranthene	YWP PAH	mg/kg	*	<0.10	<0.10	0.12
benzo(k)fluoranthene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
benzo(a)pyrene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
dibenzo(ah)anthracene	YWP PAH	mg/kg	*	<0.10	<0.10	<0.10
benzo(ghi)perylene	YWP PAH	mg/kg	*	<0.10	<0.10	0.13

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L 499594 White Young Green: Grimethorpe A42741

STL Laboratory Number	10461954	10461955	10461956
Customer Sample Ref	TP13 0.20m	TP15 0.20m	TP16 1.10m
Analyte	Method	Units	Acc
indeno(123cd)pyrene	YWP PAH	mg/kg	*
PAH (Total)	YWP PAH	mg/kg	*

<0.10	<0.10	<0.10
1.4	<1.0	1.4

Key

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L 499594 White Young Green: Grimethorpe A42741

STL Laboratory Number	10461957	10461958	10461959	10461960	10461961
Customer Sample Ref	TP3 0.20m	TP8 0.30m	TP10 1.20m	TP13 0.20m	TP16 1.10m
Analyte	Method	Units	Acc		
NRA Leachate	NRA Leachate		*	Y	Y
Aluminium (Soluble)	53F	ug/l		280	440
Arsenic (Soluble)	56	ug/l		<1.0	<1.0
Boron (Soluble)	56	mg/l		<0.050	<0.050
Cadmium (Soluble)	56	ug/l		<0.50	<0.50
Chromium (Soluble)	56	ug/l		<2.0	<2.0
Copper (Soluble)	56	ug/l		<5.0	<5.0
Iron (Soluble)	56	mg/l		0.13	0.14
Lead (Soluble)	56	ug/l		<1.0	<1.0
Mercury (Soluble)	56	ug/l		<0.20	<0.20
Nickel (Soluble)	56	ug/l		<2.0	<2.0
Selenium (Soluble)	56	ug/l		<0.30	<0.30
Zinc (Soluble)	56	ug/l		<5.0	<5.0
Chromium (Hexavalent)	13	ug/l		<20	<20
Cyanide (Total)	14c	mg/l	*	<0.050	<0.050
Sulphate as SO4	60	g/l		<0.024	<0.024
Ammonia as N	60	mg/l		<0.20	<0.20
COD (filtered) as O2	11	mg/l		13	10
Chloride as Cl	60	mg/l		<2.0	<2.0
Sulphide as S	38A	mg/l		<0.010	<0.010
pH	31	pH units		8	8
Total Phenol	PHOHLOW1	ug/l	*	<0.50	0.76
				<0.50	1.2
				<0.50	<0.50

Key

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I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

Acc = Accreditation codes: * = not UKAS accredited.

L 499594 White Young Green: Grimethorpe A42741

STL	Customer	
Laboratory Number	Sample Ref	Visual Description
10461946	TP1 0.20m	Brown clay with occasional stones and organic matter
10461947	TP2 1.40m	Brown clay with occasional stones
10461948	TP3 0.20m	Brown clay with occasional stones and organic mater
10461949	TP5 0.20m	Brown clay with occasional stones and organic mater
10461950	TP6 0.20m	Brown loam with occasional stones and organic mater
10461951	TP8 0.30m	Brown loam with occasional stones and organic mater
10461952	TP10 1.20m	Brown loam with occasional stones
10461953	TP11 0.20m	Brown loam with occasional stones
10461954	TP13 0.20m	Brown loam with occasional stones and organic mater
10461955	TP15 0.20m	Brown clay with occasional organic matter and some stones
10461956	TP16 1.10m	Brown loam with some stones

Key

N/S - Not Scheduled

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

L 499594 White Young Green: Grimethorpe A42741

<u>STL</u>	<u>Customer</u>	
<u>Laboratory Number</u>	<u>Sample Ref</u>	<u>Comment</u>
10461946	TP1	0.20m
10461947	TP2	1.40m
10461948	TP3	0.20m
10461949	TP5	0.20m
10461950	TP6	0.20m
10461951	TP8	0.30m
10461952	TP10	1.20m
10461953	TP11	0.20m
10461954	TP13	0.20m
10461955	TP15	0.20m
10461956	TP16	1.10m
10461957	TP3	0.20m
10461958	TP8	0.30m
10461959	TP10	1.20m
10461960	TP13	0.20m
10461961	TP16	1.10m

Key

N/S - Not Scheduled

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

L 499589 White Young Green: Grimethorpe A42741

STL Laboratory Number				10461888	10461889	10461890	10461891	10461892
Customer Sample Ref				TP2 0.20m	TP4 0.20m	TP7 1.20m	TP12 0.10m	TP15 1.20m
Analyte	Method	Units	Acc					
Stones BG 2.6/3.0	Stones	%	*	1.4	3.5	8.7	3.2	10
Moisture content at 30 C	33A	%	*	20	14	10	11	7.5
EN 12457-3 Leachate	EN12457-3		*	To Follow	To Follow	To Follow	To Follow	To Follow
Moisture Content Ratio at 105C	33	% ratio	*	To Follow	To Follow	To Follow	To Follow	To Follow
Conductivity @ 20 C	19A	uS/cm	*	150	<100	<100	<100	380
Moisture at 105c	33	%	*	To Follow	To Follow	To Follow	To Follow	To Follow
TOC (Ignition in O2)	27	%	*	1.1	1.1	1.5	0.84	1.6
pH	39	pH units	*	7.1	7.1	7	6.9	7.6
PCB 7 Total	312	mg/kg		To Follow	To Follow	To Follow	To Follow	To Follow
Mineral Oils C10-C40	317	mg/kg		To Calculate	To Calculate	To Calculate	To Calculate	To Calculate
Total PAH for WAC	307WAC	mg/kg	*	<2.0	2.4	<2.0	<2.0	2.6
BTEX (Total)	336	mg/kg		To Calculate	To Calculate	To Calculate	To Calculate	To Calculate
Dry Ratio (BSEN 12457)	CALC	%	*	To Follow	To Follow	To Follow	To Follow	To Follow

Key

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To Follow - analysis incomplete (interim reports only)

Acc = Accreditation codes: * = not UKAS accredited.

L 499589 White Young Green: Grimethorpe A42741

STL Laboratory Number	10461893	10461894	10461895	10461896	10461897	10461898			
Customer Sample Ref	TP2 0.20m 2:1	TP2 0.20m 8:1	TP4 0.20m 2:1	TP4 0.20m 8:1	TP7 1.20m 2:1	TP7 1.20m 8:1			
Analyte	Method	Units	Acc						
EN Leachate 2:1	EN12457-3 2:1		*	To Follow	N/S	To Follow	N/S	To Follow	N/S
EN Leachate 8:1	EN12457-3 8:1		*	N/S	To Follow	N/S	To Follow	N/S	To Follow
Molybdenum (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Antimony (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Arsenic (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Barium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Cadmium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Chromium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Copper (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Lead (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Mercury (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Nickel (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Selenium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Zinc (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Phenol Index	32A	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Sulphate as SO4	60	mg/l		To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Chloride as Cl	60	mg/l		To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Dissolved Solids	18	mg/l	*	To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Fluoride as F-	20	mg/l		To Follow	To Follow	To Follow	To Follow	To Follow	To Follow
Total Org. Carbon (Filt)	41	mg/l		To Follow	To Follow	To Follow	To Follow	To Follow	To Follow

Key

N/S - Not Scheduled

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

Acc = Accreditation codes: * = not UKAS accredited.

L 499589 White Young Green: Grimethorpe A42741

STL Laboratory Number	10461899	10461900	10461901	10461902			
Customer Sample Ref	TP12 0.10m 2:1	TP12 0.10m 8:1	TP15 1.20m 2:1	TP15 1.20m 8:1			
Analyte	Method	Units	Acc				
EN Leachate 2:1	EN12457-3 2:1		*	To Follow	N/S	To Follow	N/S
EN Leachate 8:1	EN12457-3 8:1		*	N/S	To Follow	N/S	To Follow
Molybdenum (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Antimony (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Arsenic (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Barium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Cadmium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Chromium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Copper (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Lead (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Mercury (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Nickel (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Selenium (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Zinc (Soluble) WAC	56 WAC	mg/l	*	To Follow	To Follow	To Follow	To Follow
Phenol Index	32A	mg/l	*	To Follow	To Follow	To Follow	To Follow
Sulphate as SO4	60	mg/l		To Follow	To Follow	To Follow	To Follow
Chloride as Cl	60	mg/l		To Follow	To Follow	To Follow	To Follow
Dissolved Solids	18	mg/l	*	To Follow	To Follow	To Follow	To Follow
Fluoride as F-	20	mg/l		To Follow	To Follow	To Follow	To Follow
Total Org. Carbon (Filt)	41	mg/l		To Follow	To Follow	To Follow	To Follow

Key

N/S - Not Scheduled

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

Acc = Accreditation codes: * = not UKAS accredited.

L 499589 White Young Green: Grimethorpe A42741

STL Laboratory Number	Customer Sample Ref	Visual Description
10461888	TP2 0.20m	Brown clay with many stones and occasional sand
10461889	TP4 0.20m	Brown and grey clay with many stones
10461890	TP7 1.20m	Brown and grey loam with many stones and some clay
10461891	TP12 0.10m	Brown and grey loam with many stones, some clay and occasional roots
10461892	TP15 1.20m	Grey clay with many made ground

Key

N/S - Not Scheduled

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

L 499589 White Young Green: Grimethorpe A42741

<u>STL</u>	<u>Customer</u>	
<u>Laboratory Number</u>	<u>Sample Ref</u>	<u>Comment</u>
10461888	TP2 0.20m	
10461889	TP4 0.20m	
10461890	TP7 1.20m	
10461891	TP12 0.10m	
10461892	TP15 1.20m	
10461893	TP2 0.20m 2:1	
10461894	TP2 0.20m 8:1	
10461895	TP4 0.20m 2:1	
10461896	TP4 0.20m 8:1	
10461897	TP7 1.20m 2:1	
10461898	TP7 1.20m 8:1	
10461899	TP12 0.10m 2:1	
10461900	TP12 0.10m 8:1	
10461901	TP15 1.20m 2:1	
10461902	TP15 1.20m 8:1	

Key

N/S - Not Scheduled

I/S - Insufficient Sample

To Follow - analysis incomplete (interim reports only)

APPENDIX D:
CONTAMINATION ASSESSMENT CRITERIA
(WYGE Tier 1 TSV's)

APPENDIX D: Contamination Screening Criteria (Human Health)
Residential Without Plant Uptake

Determinand	Units	WYGE Soil Screening Value	Derivation Tool
pH		<5, >9	
Asbestos	%	Presence	Lab Screening
HEAVY METALS/METALLOIDS			
Arsenic	mg/kg	20	SGV Report 1
Cadmium	mg/kg	30	SGV Report 3
Chromium (VI)	mg/kg	200	SGV Report 4
Copper	mg/kg	135	Defra ¹
Lead	mg/kg	450	SGV Report 10
Mercury	mg/kg	15	SGV Report 5
Nickel	mg/kg	75	SGV Report 7
Selenium	mg/kg	260	SGV Report 9
Zinc	mg/kg	300	Defra ¹
GENERAL INORGANICS			
Easily Liberatable Cyanide (free)	mg/kg	36	Acute effects infant 1 dose 3g soil
US EPA PRIORITY PAHs			
Acenaphthene	mg/kg	12	RISC WORKBENCH 4
Acenaphthylene	mg/kg	1	RISC WORKBENCH 4
Anthracene	mg/kg	3400	RISC WORKBENCH 4
Benzo(a)Anthracene	mg/kg	7.8	RISC WORKBENCH 4
Benzo(a)pyrene	mg/kg	1.4	RISC WORKBENCH 4
Benzo(b)fluoranthene	mg/kg	17	RISC WORKBENCH 4
Benzo(k)fluoranthene	mg/kg	17	RISC WORKBENCH 4
Benzo(g,h,i)perylene	mg/kg	2600	RISC WORKBENCH 4
Chrysene	mg/kg	170	RISC WORKBENCH 4
Di-benzo(a,h)anthracene	mg/kg	1.7	RISC WORKBENCH 4
Indeno(1,2,3-cd)pyrene	mg/kg	17	RISC WORKBENCH 4
Fluoranthene	mg/kg	103	RISC WORKBENCH 4
Fluorene	mg/kg	3400	RISC WORKBENCH 4
Naphthalene	mg/kg	5.6	RISC WORKBENCH 4
Phenanthrene	mg/kg	3400	RISC WORKBENCH 4
Pyrene	mg/kg	1700	RISC WORKBENCH 4
Phenolics			
Phenol	mg/kg	34,400	SGV Report 8

Determinand	Units	WYGE Soil Screening Value	Derivation Tool
TPH			
TPH Aliphatic >C5-6	mg/kg	14	RISC WORKBENCH 4
TPH Aliphatic >C6-8	mg/kg	35	RISC WORKBENCH 4
TPH Aliphatic >C8-10	mg/kg	8.2	RISC WORKBENCH 4
TPH Aliphatic >C10-12	mg/kg	42	RISC WORKBENCH 4
TPH Aliphatic >C12-16	mg/kg	6800	RISC WORKBENCH 4
TPH Aliphatic >C16-35	mg/kg	190,000	RISC WORKBENCH 4
TPH Aromatic >EC5-7	mg/kg	0.05	RISC WORKBENCH 4
TPH Aromatic >EC7-8	mg/kg	8	RISC WORKBENCH 4
TPH Aromatic >EC8-10	mg/kg	13	RISC WORKBENCH 4
TPH Aromatic >EC10-12	mg/kg	72	RISC WORKBENCH 4
TPH Aromatic >EC12-16	mg/kg	345	RISC WORKBENCH 4
TPH Aromatic >EC16-21	mg/kg	2800	RISC WORKBENCH 4
TPH Aromatic >EC21-35	mg/kg	2800	RISC WORKBENCH 4

¹ Criteria are based on phytotoxicity potential and do not represent human health risk criteria

All WYGE derived screening values calculated using a Fraction Organic Carbon (FOC) value of 1.45%, equivalent to a Soil Organic Matter (SOM) of 2.5%.

APPENDIX D:
CONTAMINATION ASSESSMENT CRITERIA: LEACHABILITY RESULTS
(Level 1 Screening Values).

Determinand		Criterion
Arsenic	µg/l	10
Cadmium	µg/l	5
Chromium	µg/l	50
Lead	µg/l	25
Mercury	µg/l	1
Selenium	µg/l	10
Copper	µg/l	2000
Nickel	µg/l	20
Zinc	µg/l	5000
pH	-	5.5 – 9.5
Sulphate	mg/l	250
Ammoniacal nitrogen	mg NH ₄ /l	0.5
Cyanide (total)	µg/l	50
Chloride	mg/l	250
PAHs: Benzo(a)pyrene	µg/l	0.010
PAHs: Sum of 4 specified	µg/l	0.1

All values derived from Water Supply (Water Quality) Regulations 2000

**APPENDIX E:
CALIFORNIA BEARING RATIO TEST RESULTS**



the obvious choice

CMT (Testing) Limited

Prime Parkway, Prime Enterprise Park, Derby DE1 3QB

Tel: 01332 383333

Fax: 01332 602607

email: testing@cmt-ltd.co.uk

www.cmt-ltd.co.uk

Client: White Young Green Limited
Newstead Court
Little Oak Drive
Annesley, Nottingham
NG15 0DR



Date: 25th February 2008

Lab Ref: 33627

Order Ref: ENV10966-5104

Originator: Chris Arnott

Site: Land off Haughton Main
Business Park Roundabout
Grimethorpe

Requirements: To attend the above site on 22nd February 2008 and carry out 7 No. 150mm Diameter Plate Bearing Tests to evaluate the modulus of sub-grade reaction 'K' and estimate the equivalent CBR percentage.

Results: The individual result sheets are appended.

CMT (Testing) Limited


Signed: D E Spencer
Senior Technician


Checked and approved by: Scott James
Laboratory Supervisor



CMT (Testing) Limited

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 Fax: 01332 602607

email: testing@cmt-ltd.co.uk
 www.cmt-ltd.co.uk

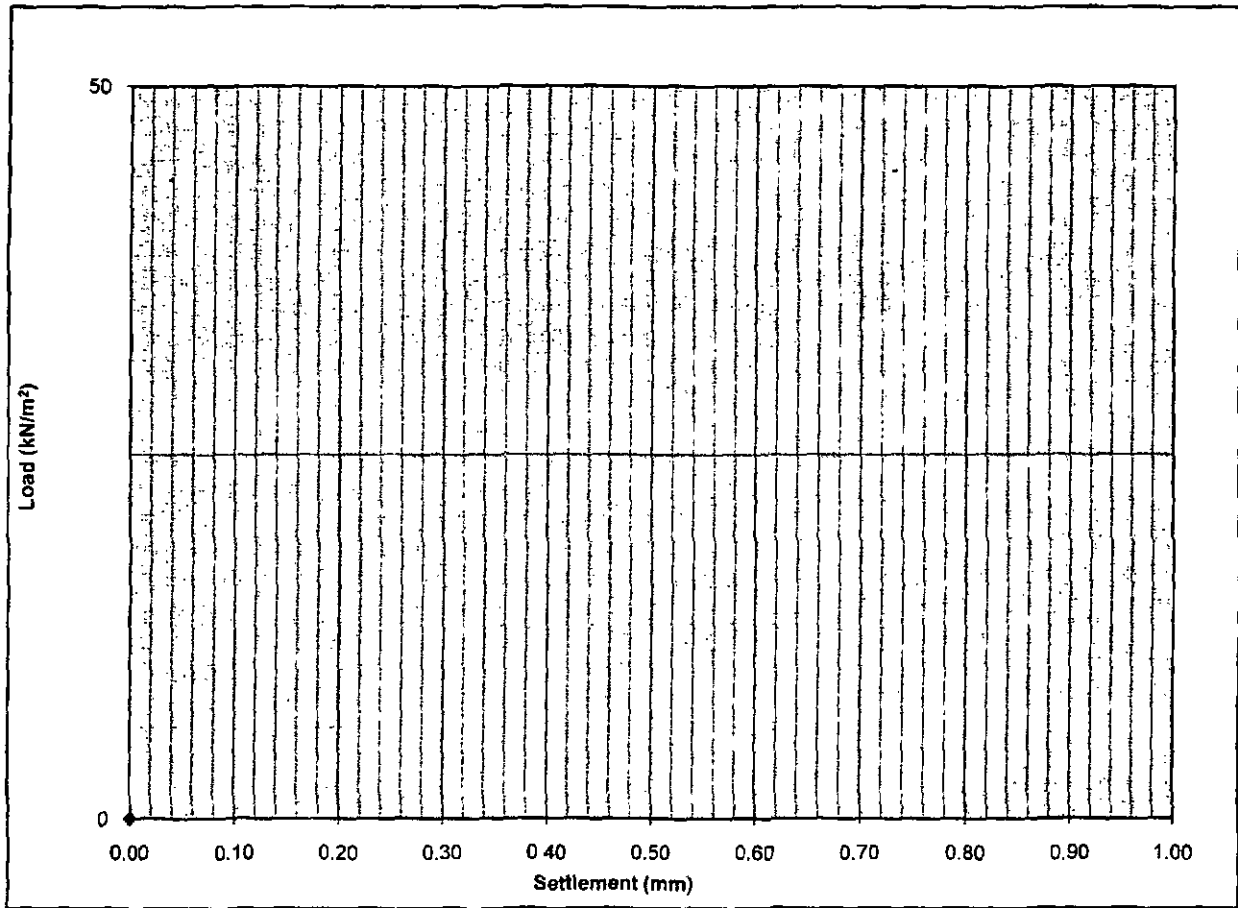
150 mm Diameter Plate Test

Client: White Young Green Limited
Material Type: Light brown grey mottled CLAY with mudstone

Site: Land off Houghton Main
 Business Park Roundabout
 Grimethorpe
Test No.: 1

Lab Ref.: 33627
Date of Test: 22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
-	-
-	-
-	-
0	-



Comments: Modulus 'k' = N/A
 Equivalent CBR %= N/A

Test abandoned due to water entering pit

[Signature]
 Signed by: Scott James
 Laboratory Supervisor



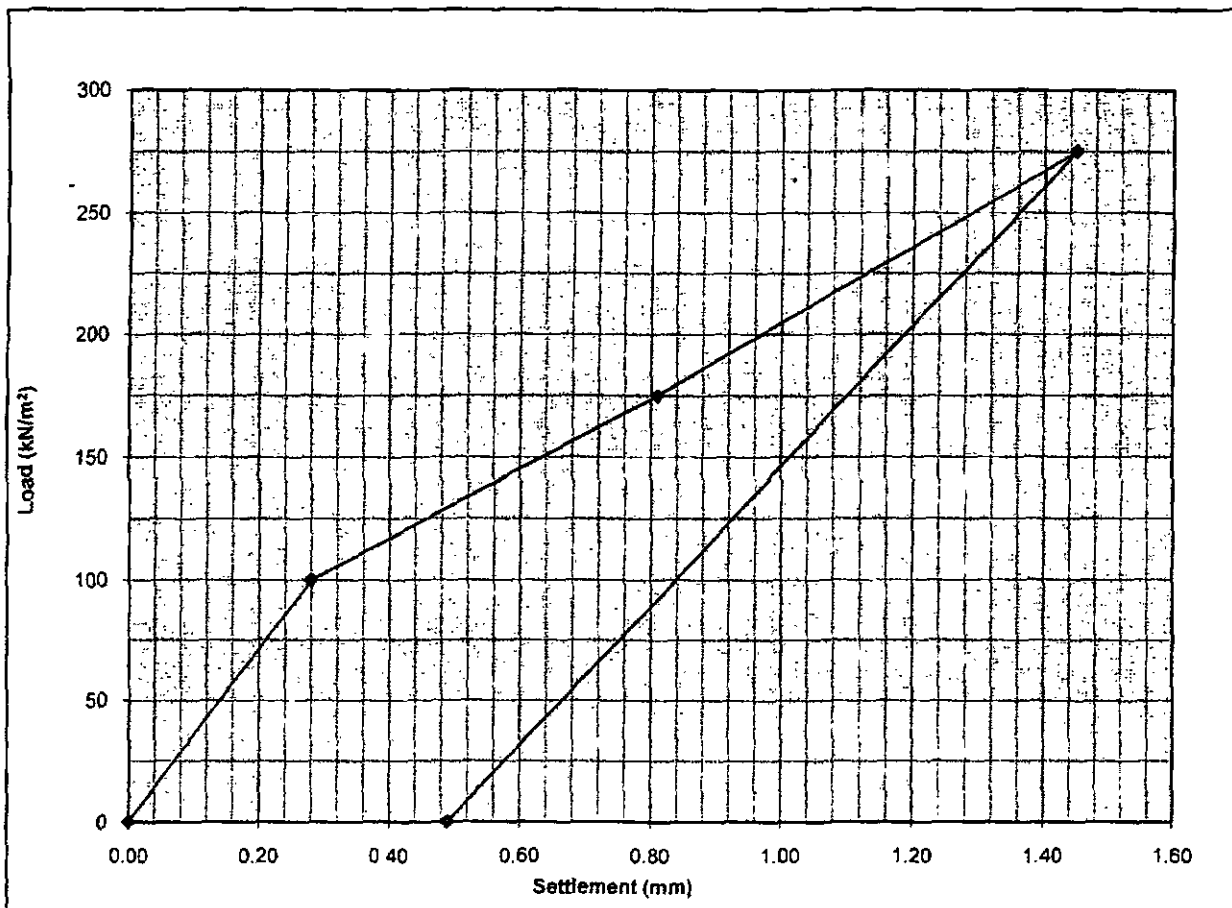
CMT (Testing) Limited

Prime Parkway, Prime Enterprise Park, Derby DE1 3QB
 Tel: 01332 383333 email: testing@cmt-ltd.co.uk
 Fax: 01332 602607 www.cmt-ltd.co.uk

150 mm Diameter Plate Test

Client: White Young Green Limited	Material Type: Light brown grey mottled CLAY with sandstone fragments
Site: Land off Haughton Main Business Park Roundabout Grimethorpe	Test No.: 2
Lab Ref.: 33844	Location: 1A
	Date of Test: 12-Mar-08

Load (kN/m ²)	Settlement (mm)
0	0.00
100	0.28
175	0.81
275	1.45
0	0.49



Comments: Modulus 'k' = 50820
 Equivalent CBR %= 8.7

[Signature]
 Signed by: Scott James
 Laboratory Supervisor



the obvious choice

CMT (Testing) Limited

Prime Parkway, Prime Enterprise Park, Derby DE1 3QB

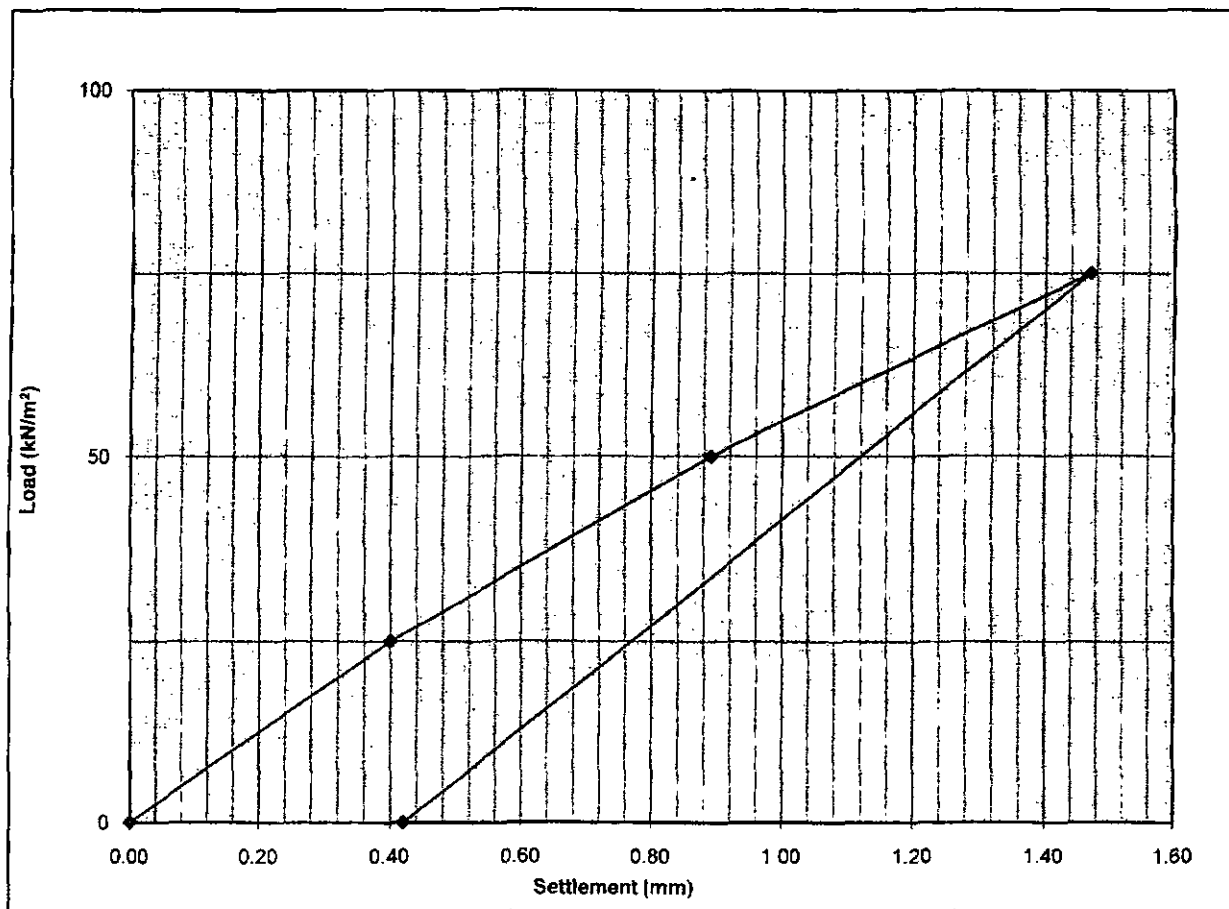
Tel: 01332 383333
Fax: 01332 602607

email: testing@cmt-ltd.co.uk
www.cmt-ltd.co.uk

150 mm Diameter Plate Test

Client:	White Young Green Limited	Material Type:	Light brown grey mottled CLAY with mudstone
Site:	Land off Houghton Main Business Park Roundabout Grimethorpe	Test No.:	2
Lab Ref.:	33627	Location:	2
		Date of Test:	22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
25	0.40
50	0.89
75	1.47
0	0.42



Comments:

Modulus 'k' = 13746
Equivalent CBR %= 0.9

Signed by: Scott James
Laboratory Supervisor



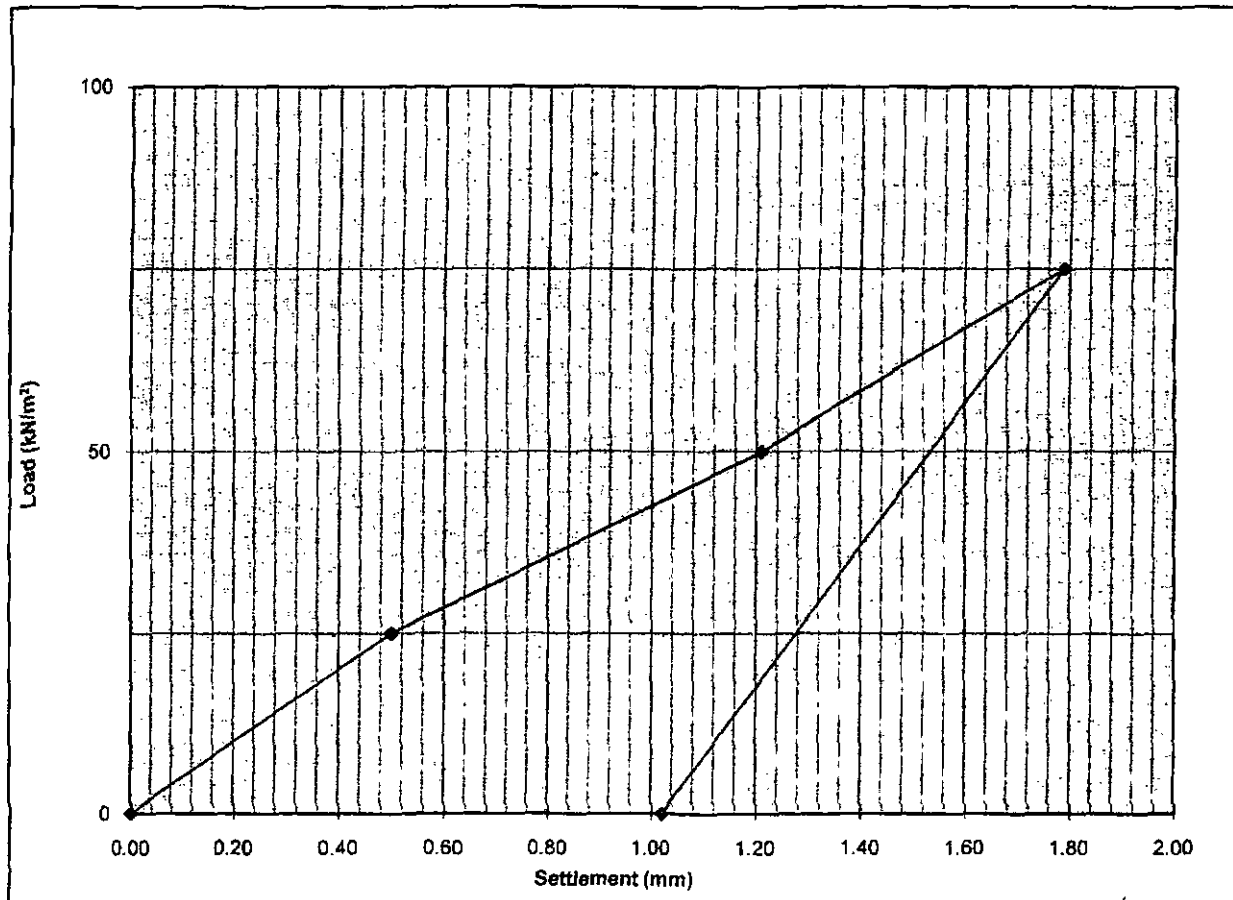
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 Fax: 01332 602607 www.cmt-ltd.co.uk

150 mm Diameter Plate Test

Client:	White Young Green Limited	Material Type:	Light brown grey mottled CLAY with mudstone
Site:	Land off Haughton Main Business Park Roundabout Grimethorpe	Test No.:	3
Lab Ref.:	33627	Location:	3
		Date of Test:	22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
25	0.50
50	1.21
75	1.79
0	1.02



Comments:

Modulus 'k' = 10831
 Equivalent CBR %= 0.6

Signed by: Scott James
 Laboratory Supervisor



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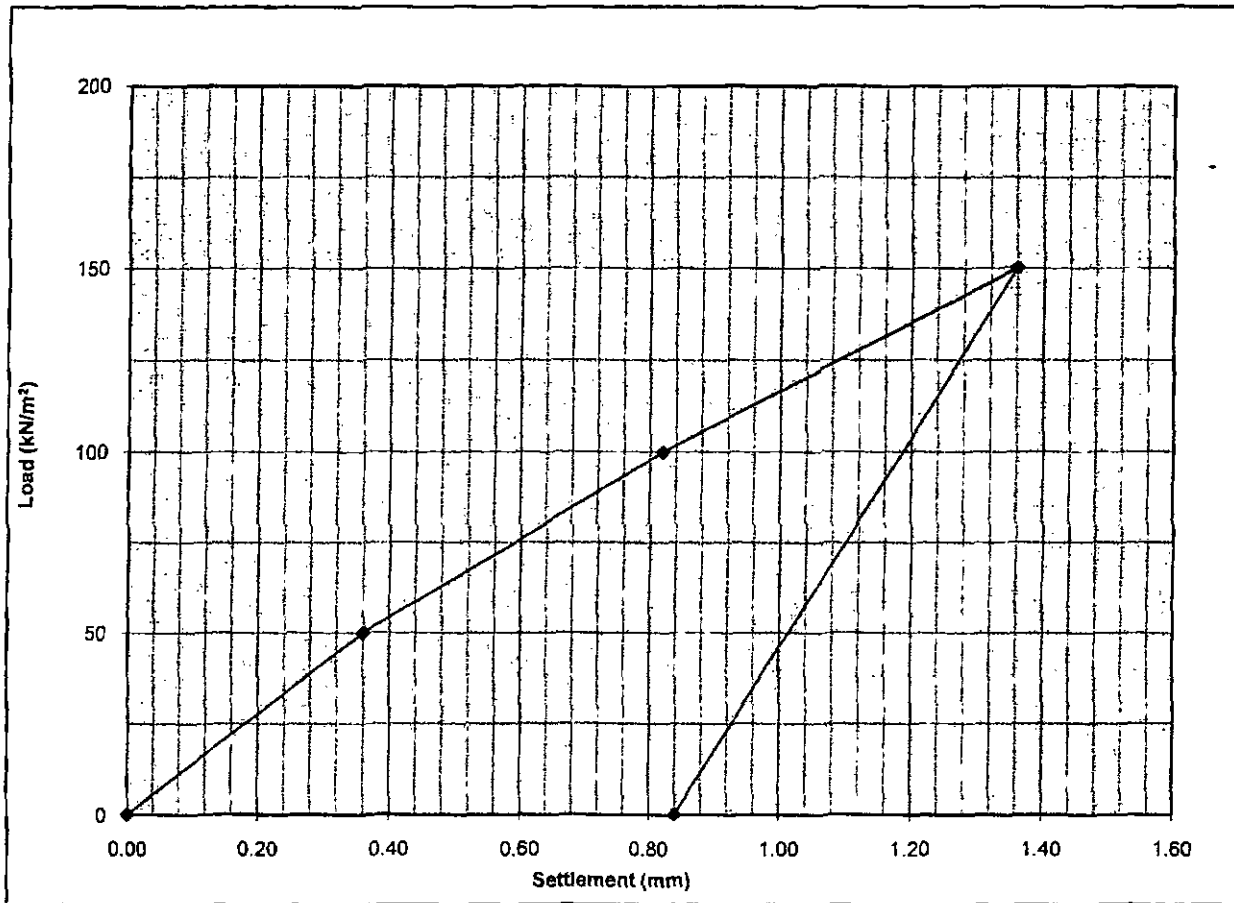
150 mm Diameter Plate Test

Client: White Young Green Limited **Material Type:** Light brown grey mottled CLAY with mudstone

Site: Land off Houghton Main **Test No.:** 4
 Business Park Roundabout
 Grimethorpe **Location:** 4

Lab Ref.: 33627 **Date of Test:** 22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
50	0.36
100	0.82
150	1.36
0	0.84



Comments:

Modulus 'k' = 29159
 Equivalent CBR %= 3.3

(Signature)
 Signed by: Scott James
 Laboratory Supervisor



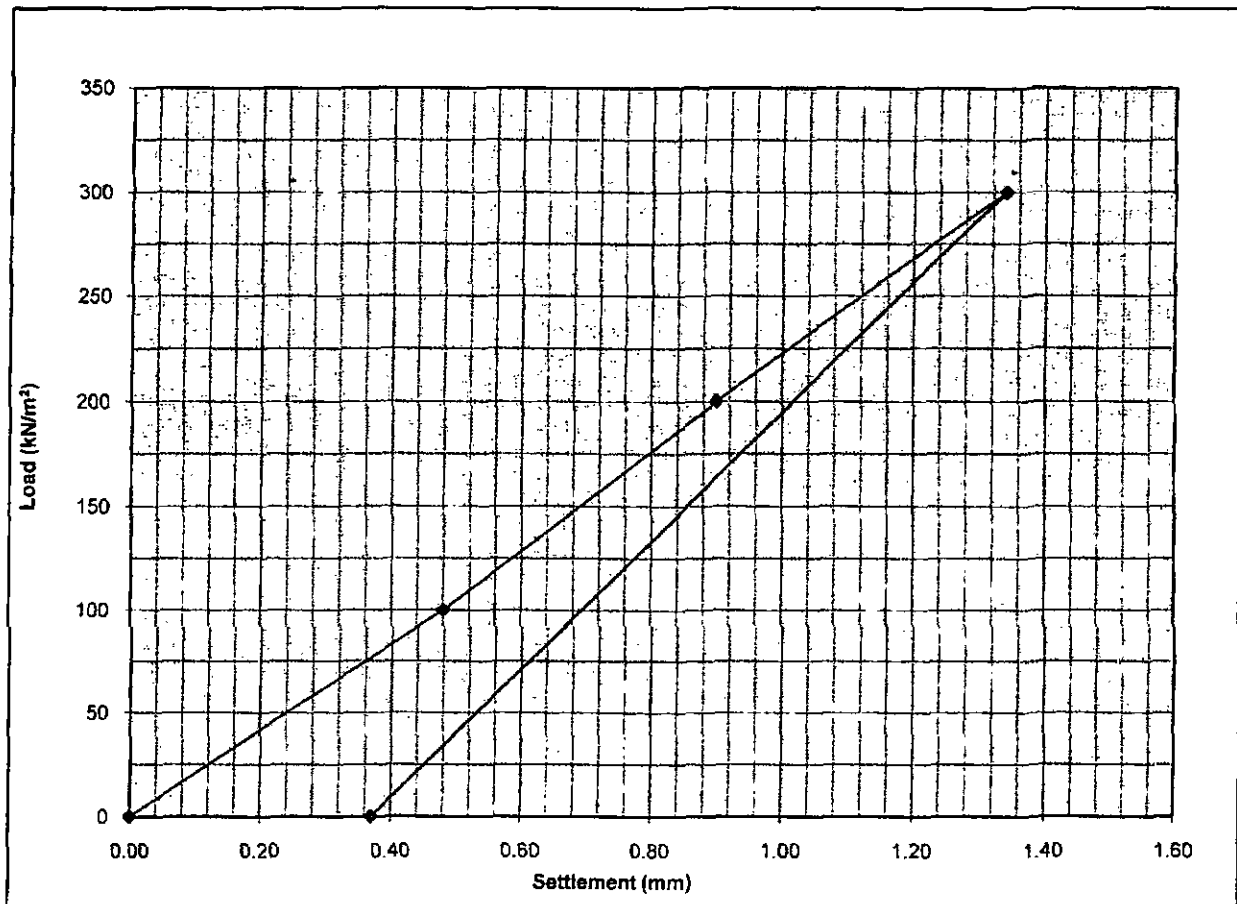
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150 mm Diameter Plate Test

Client: White Young Green Limited **Material Type:** Crushed brick and concrete
Site: Land off Houghton Main **Test No.:** 5
 Business Park Roundabout **Location:** 5
 Grimethorpe
Lab Ref.: 33627 **Date of Test:** 22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
100	0.48
200	0.90
300	1.34
0	0.37



Comments: Modulus 'k' = 58318
 Equivalent CBR %= 11.1

[Signature]
 Signed by: Scott James
 Laboratory Supervisor



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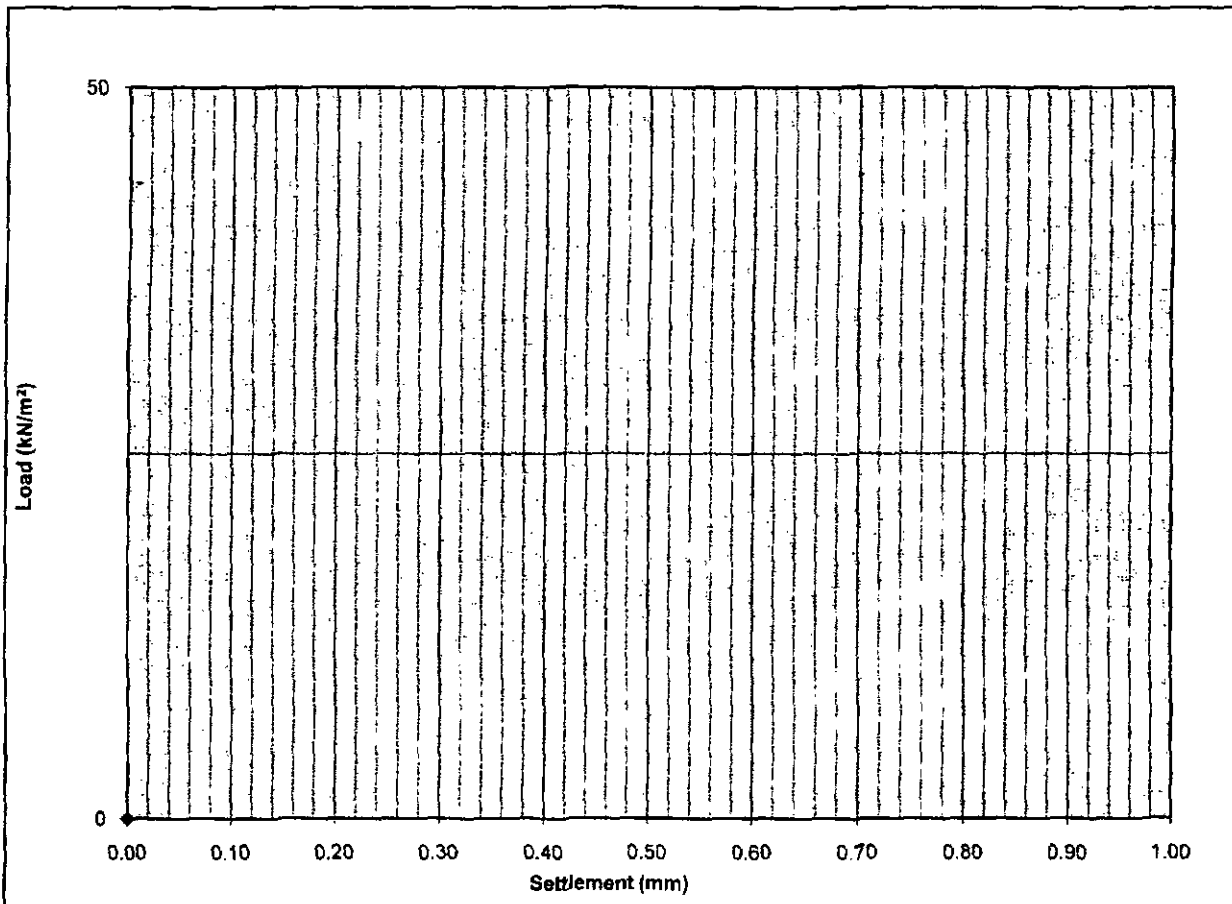
Tel: 01332 383333
Fax: 01332 602607

email: testing@cmt-ltd.co.uk
www.cmt-ltd.co.uk

150 mm Diameter Plate Test

Client:	White Young Green Limited	Material Type:	Light brown grey mottled CLAY with mudstone
Site:	Land off Haughton Main Business Park Roundabout Grimethorpe	Test No.:	6
Lab Ref.:	33627	Location:	6
		Date of Test:	22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
-	-
-	-
-	-
0	-



Comments: Modulus 'k' = N/A
Equivalent CBR %= N/A

Test abandoned due to water entering pit

[Signature]
Signed by: Scott James
Laboratory Supervisor



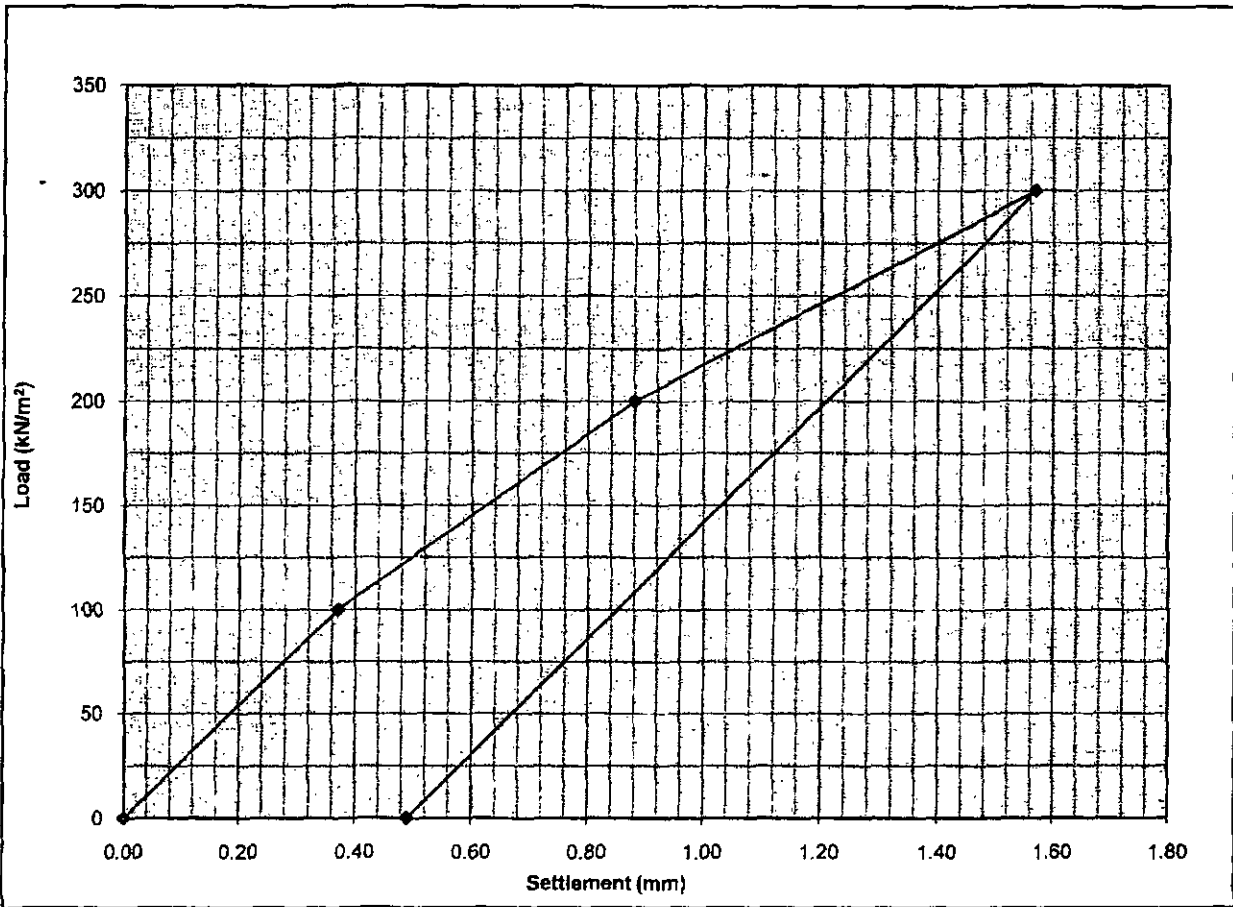
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150 mm Diameter Plate Test

Client: White Young Green Limited **Material Type:** Light brown grey mottled CLAY with sandstone fragments
Site: Land off Haughton Main Business Park Roundabout Grimethorpe **Test No.:** 3
Lab Ref.: 33844 **Location:** 6A
Date of Test: 12-Mar-08

Load (kN/m ²)	Settlement (mm)
0	0.00
100	0.37
200	0.88
300	1.57
0	0.49



Comments:

Modulus 'k' = 52903
 Equivalent CBR %= 9.4

Signed by: *Scott James*
 Laboratory Supervisor



CMT (Testing) Limited

Prime Parkway, Prime Enterprise Park, Derby DE1 3QB

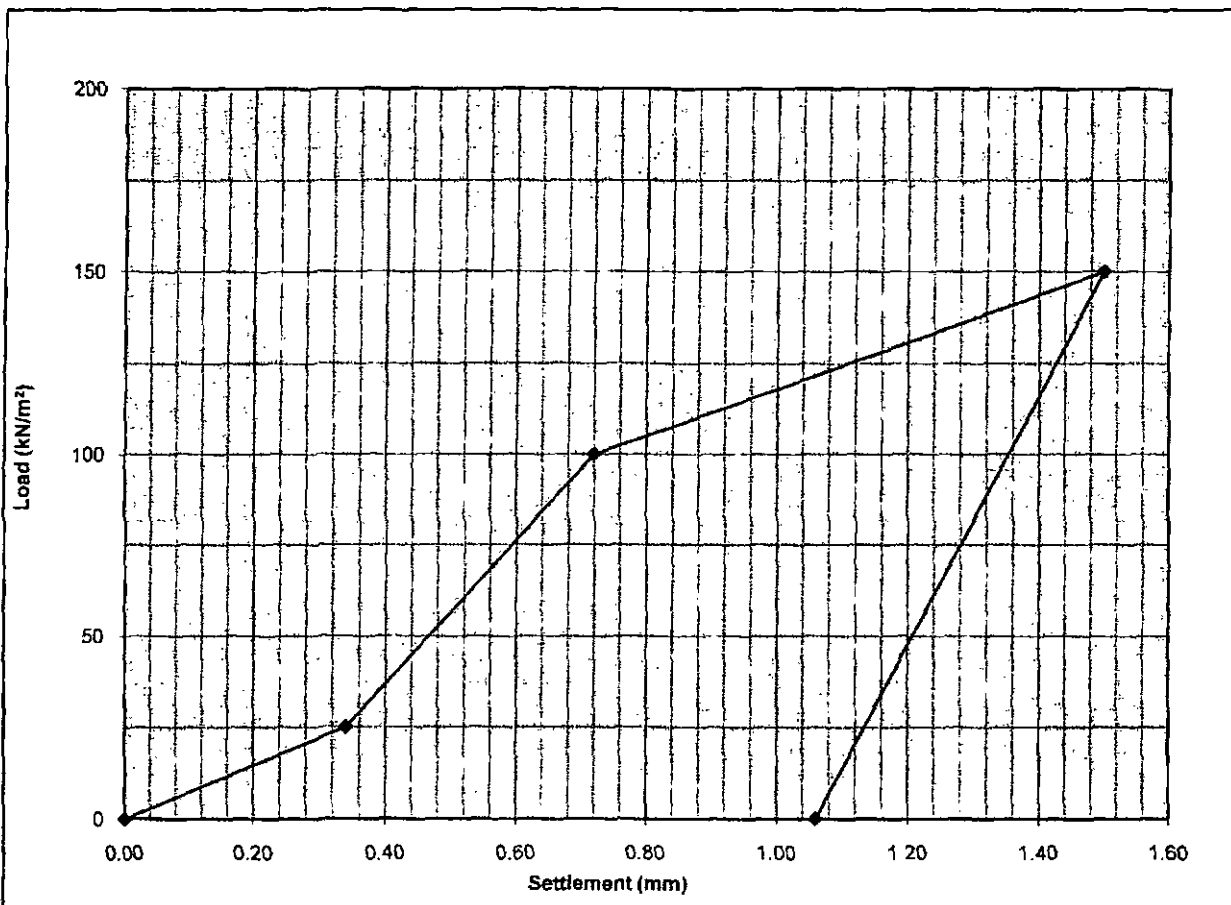
Tel: 01332 583333
Fax: 01332 602607

email: testing@cmt-ltd.co.uk
www.cmt-ltd.co.uk

150 mm Diameter Plate Test

Client:	White Young Green Limited	Material Type:	Light brown grey mottled CLAY with mudstone
Site:	Land off Haughton Main Business Park Roundabout Grimethorpe	Test No.:	7
Lab Ref.:	33627	Location:	7
		Date of Test:	22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
25	0.34
100	0.72
150	1.50
0	1.06



Comments:

Modulus 'k' = 27910
Equivalent CBR %= 3.1

[Signature]
Signed by: Scott James
Laboratory Supervisor



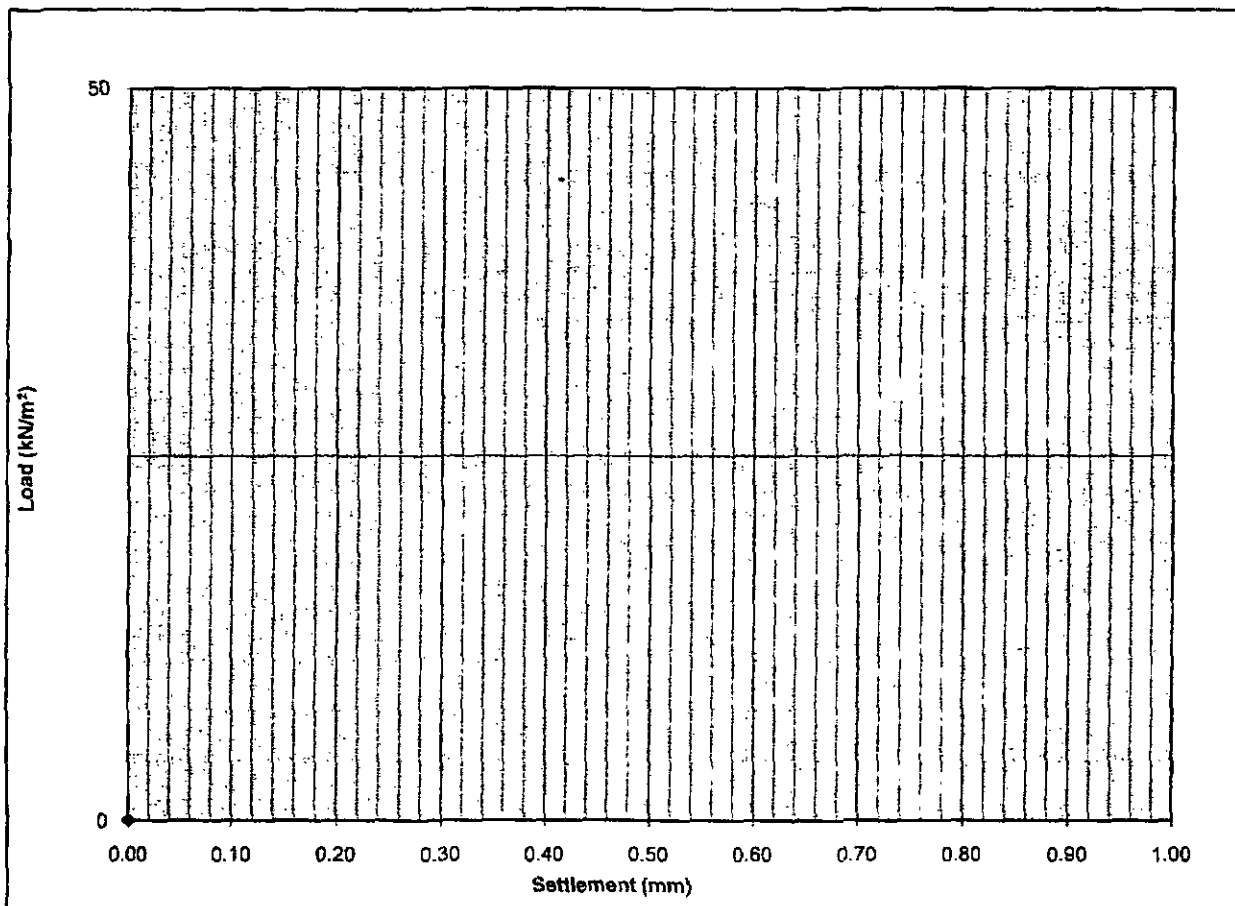
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150 mm Diameter Plate Test

Client: White Young Green Limited **Material Type:** Light brown grey mottled CLAY with mudstone
Site: Land off Haughton Main **Test No.:** 8
 Business Park Roundabout **Location:** 8
 Grimethorpe
Lab Ref.: 33627 **Date of Test:** 22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
-	-
-	-
-	-
0	-



Comments: Modulus 'k' = N/A
 Equivalent CBR %= N/A

Test abandoned due to water entering pit

[Signature]
 Signed by: Scott James
 Laboratory Supervisor



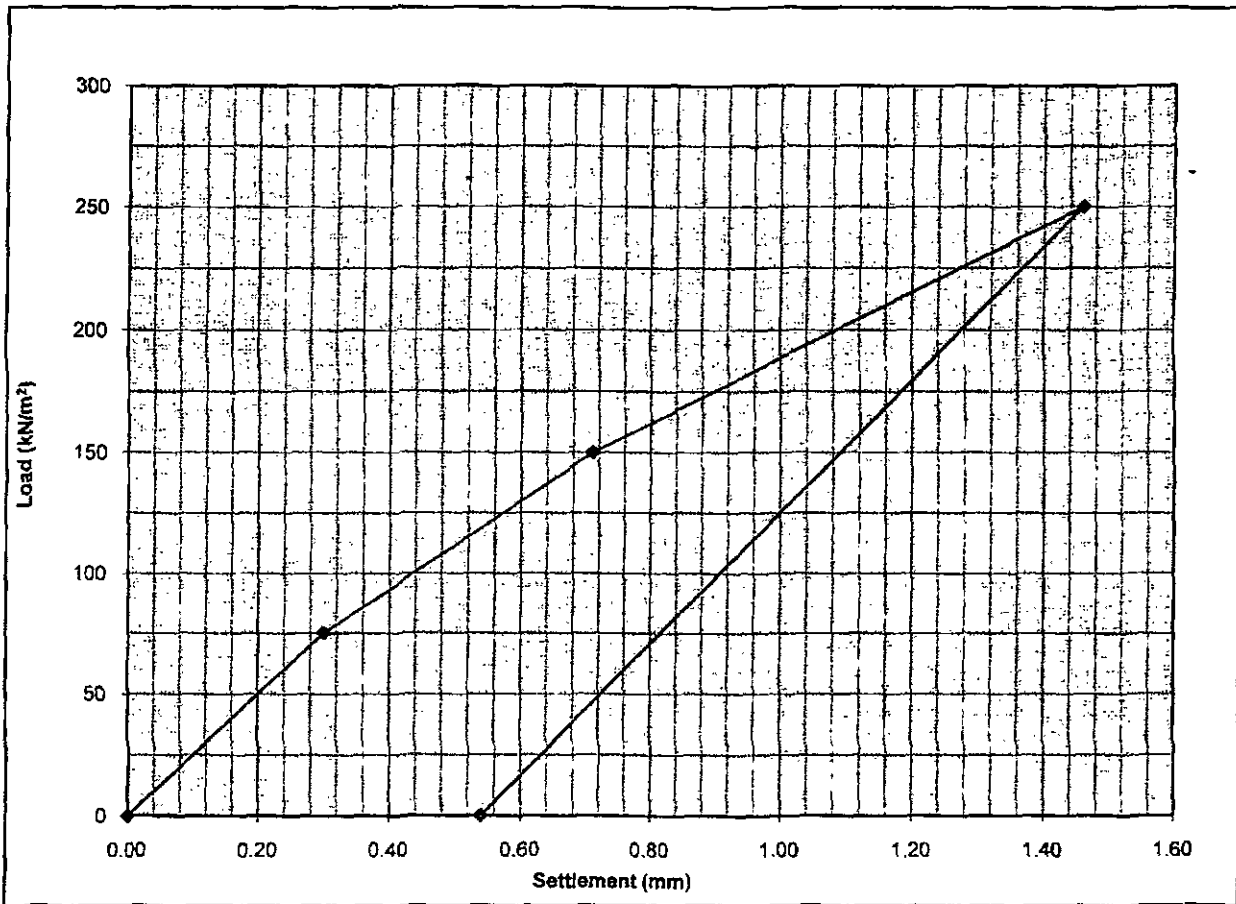
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 Tel: 01332 383333 email: testing@cmt-ltd.co.uk
 Fax: 01332 602607 www.cmt-ltd.co.uk

150 mm Diameter Plate Test

Client: White Young Green Limited **Material Type:** Light brown grey mottled CLAY with sandstone fragments
Site: Land off Haughton Main Business Park Roundabout Grimethorpe **Test No.:** 1
Lab Ref.: 33844 **Location:** 8A
Date of Test: 12-Mar-08

Load (kN/m ²)	Settlement (mm)
0	0.00
75	0.30
150	0.71
250	1.46
0	0.54



Comments:

Modulus 'k' = 46238
 Equivalent CBR %= 7.4

(Signature)
 Signed by Scott James
 Laboratory Supervisor



CMT (Testing) Limited

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 Fax: 01332 602607 www.cmt-ltd.co.uk

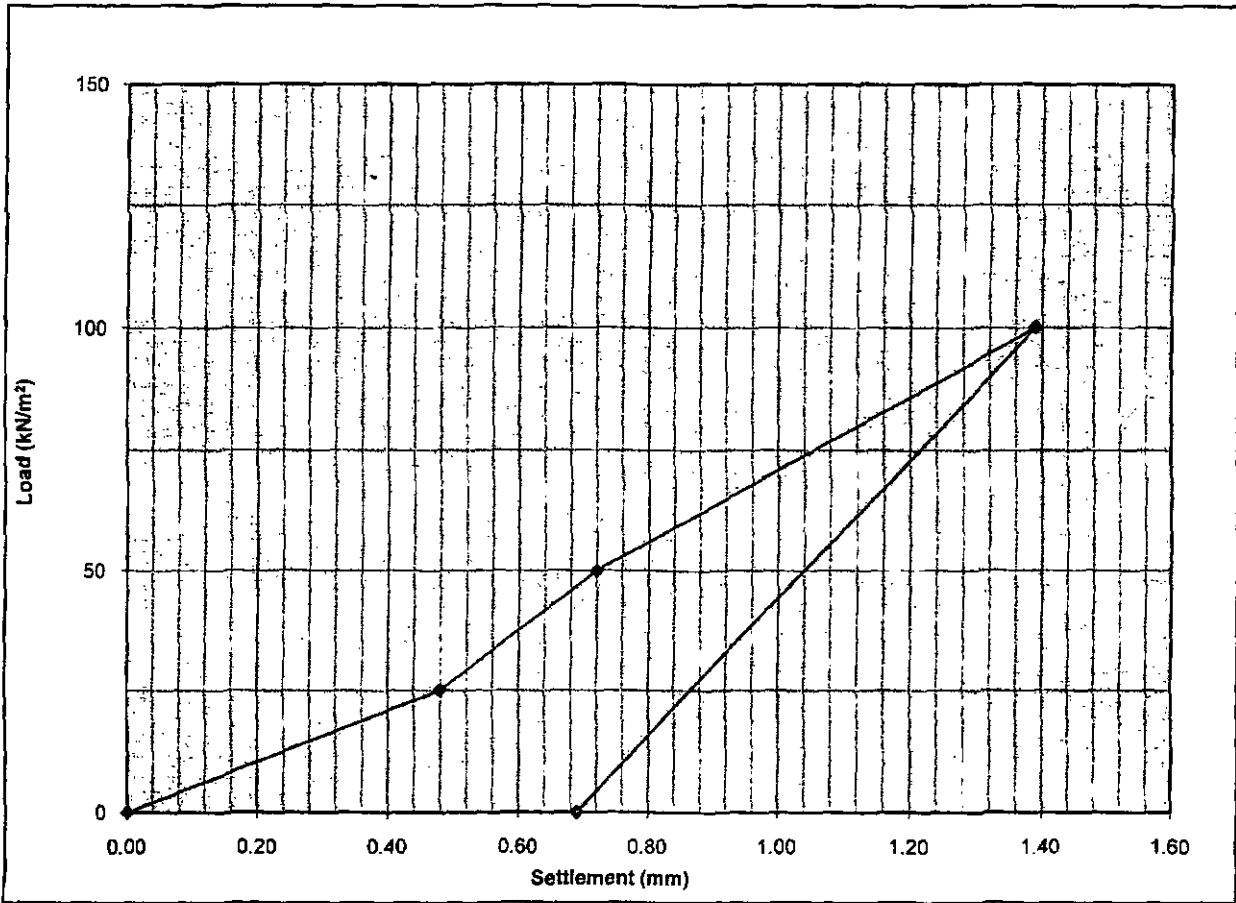
150 mm Diameter Plate Test

Client: White Young Green Limited **Material Type:** Light brown grey mottled CLAY with mudstone

Site: Land off Haughton Main **Test No.:** 9
 Business Park Roundabout
 Grimethorpe **Location:** 9

Lab Ref.: 33627 **Date of Test:** 22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
25	0.48
50	0.72
100	1.39
0	0.69



Comments:

Modulus 'k' = 18745
 Equivalent CBR %= 1.5

[Signature]
 Signed by: Scott James
 Laboratory Supervisor



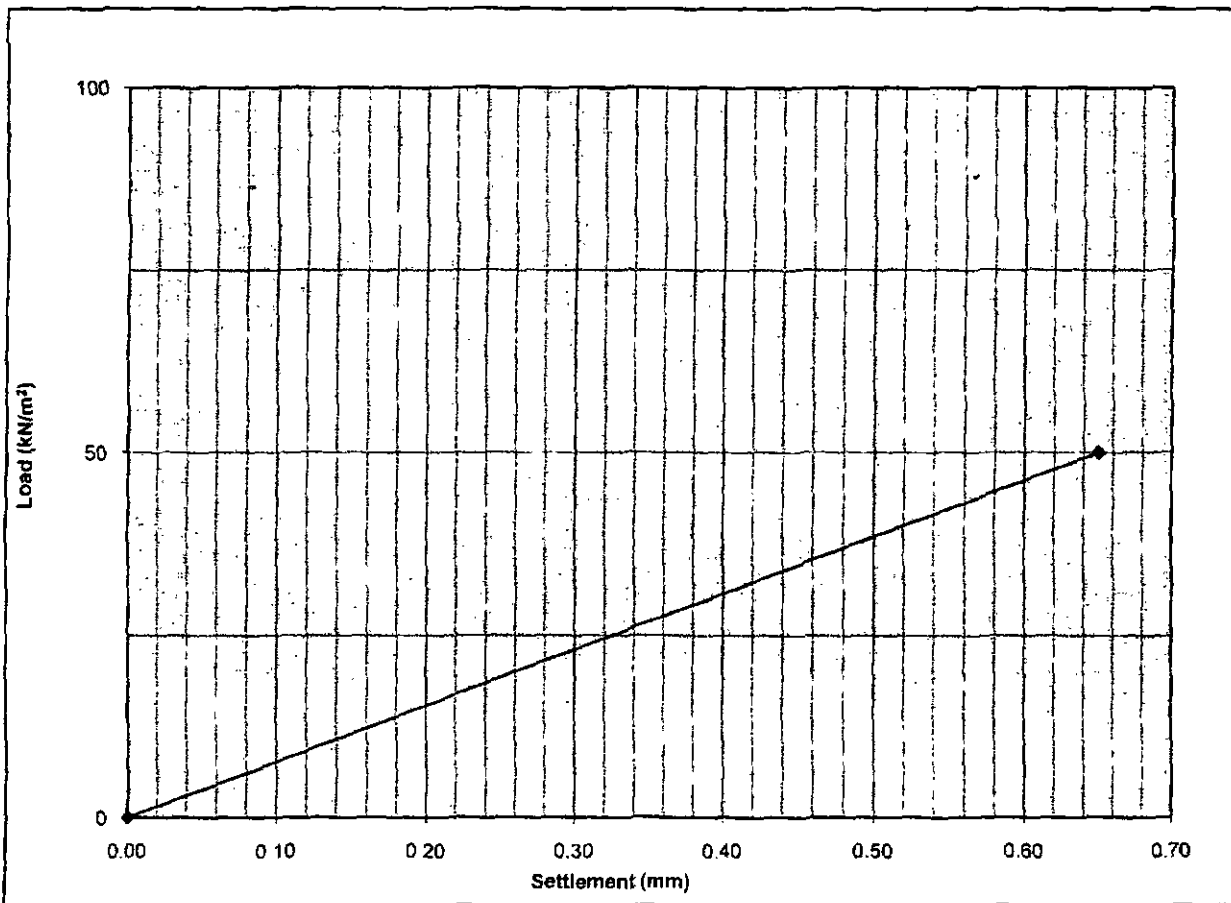
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 Tel: 01332 383333 email: testing@cmt-ltd.co.uk
 Fax: 01332 602607 www.cmt-ltd.co.uk

150 mm Diameter Plate Test

Client: White Young Green Limited **Material Type:** Light brown grey mottled CLAY with mudstone
Site: Land off Haughton Main **Test No.:** 10
 Business Park Roundabout **Location:** 10
 Grimethorpe
Lab Ref.: 33627 **Date of Test:** 22-Feb-08

Load (kN/m ²)	Settlement (mm)
0	0.00
50	0.65
-	-
-	-
0	-



Comments:

Modulus 'k' = N/A
 Equivalent CBR %= N/A

Test abandoned due to water entering pit

Signed by: Scott James
 Laboratory Supervisor

**APPENDIX F:
GEOTECHNICAL LABORATORY REPORTS**

Summary of Geotechnical Laboratory results

Sample Data					Classification BS 1377 Part 2										Compaction BS1377 Part 4			Rock ISRM		Strength & Compression testing BS 1377 Parts 5 & 7												
TP / BH No.	Other Id	Samprum	Depth from (m)	Depth to (m)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity index	Plasticity category	Material passing 425um	Linear Shrinkage	Saturated Moisture content	Bulk Density	Dry Density	PSD / Sedimentation	Particle Density	CBR	MCV	Compaction	Point load Axial IS50	Point load Diametral IS50	Triaxial Type	Diameter	Cell Pressure	Corrected Deviator Stress	Undrained Shear Strength	Strain @ Failure	Mode of Failure	Hand Shear Vane *	One Dimensional Consolidation		
					%	%	%	%		%	%	%	Mg/m ³	Mg/m ³		Mg/m ³				MPa	MPa		mm	kPa	kPa	CUkPa	%		kPa			
TP01	B	41126	1.2	1.4																												
TP01	B	41127	2.4	2.6																												
TP02	B	41128	0.2	0.4																												
TP02	B	41129	2.5	2.8																												
TP04	B	41130	0.2	0.4																												
TP04	B	41131	1.4	1.6	9.5										X																	
TP04	B	41132	2.4	2.6	10								2.17	1.97																		
TP05	B	41133	1.2	1.4	10								2.14	1.95																		
TP07	B	41134	0.2	0.4		36	20	16	CI	92																						
TP07	B	41135	2.4	2.6											X																	
TP13	B	41136	1.4	1.6		35	19	17	CI	80																						
TP13	B	41137	2.4	2.6	11								2.04	1.84																		
TP14	B	41138	0.1	0.15	15										X																	
TP14	B	41139	1.5	1.7											X																	
TP16	B	41140	0.2	0.4	17	35	20	15	CI	100			2.11	1.8																		
TP16	B	41141	2.1	2.3		33	17	16	CL	90																						
CP1	D	41142	0.5																													
CP1	D	41143	1			36	17	19	CI	90																						
CP1	D	41144	1.5		8.7																											
CP1	D	41145	2																													
CP1	B	41146	2.5		16								2.2	1.9																		
CP1	D	41147	3		8.1																											
CP1	B	41148	3.5												X																	
CP1	D	41149	4																													

Summary of Geotechnical Laboratory results

RP09a 08/07/05

Sample Data					Classification BS 1377 Part 2										Compaction BS1377 Part 4			Rock ISRM		Strength & Compression testing BS 1377 Parts 5 & 7											
TP / BH No.	Other Id	Sample No	Depth from (m)	Depth to (m)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity index	Plasticity category	Material passing 425um	Linear Shrinkage	Saturated Moisture content	Bulk Density	Dry Density	PSD / Sedimentation	Particle Density	CBR	MCV	Compaction	Point load Axial IS60	Point load Diametral IS50	Triaxial Type	Diameter	Cell Pressure	Corrected Deviator Stress	Undrained Shear Strength	Strain @ Failure	Mode of Failure	Hand Shear Vane *	One Dimensional Consolidation	
					%	%	%	%		%	%	%	Mg/m ³	Mg/m ³		Mg/m ³				MPa	MPa		mm	kPa	kPa	CUkPa	%		kPa		
CP1	B	41150	5		19								2.09	1.76																	
CP1	D	41151	5.7			40	28	13	MI	100																					
CP2	D	41152	0.5		20																										
CP2	D	41153	1																												
CP2	D	41154	1.5																												
CP2	D	41155	2			37	20	17	CI	85																					
CP2	B	41156	2.5		19								2.11	1.77																	
CP2	D	41157	3		19																										
CP2	B	41158	3.5												X																
CP2	D	41159	4			38	19	19	CI	80																					
CP2	D	41160	5		13																										
CP2	B	41161	5.5		18								2.13	1.81																	
CP3	D	41162	0.5			33	19	14	CL	92																					
CP3	D	41163	1		19																										
CP3	B	41164	1.5		12								2.13	1.9																	
CP3	D	41165	2		14																										
CP3	D	41166	2.5			I/S	I/S	I/S	I/S	I/S																					
CP3	B	41167	2.5												X																
CP3	D	41168	3																												
CP3	D	41169	3.5																												
CP3	B	41170	3.5		18								2.11	1.79																	
CP3	D	41171	4.5																												
CP3	B	41172	5.5												X																
CP4	D	41173	0.5		20																										

Summary of Geotechnical Laboratory results

Sample Data					Classification BS 1377 Part 2										Compaction BS1377 Part 4			Rock ISRM		Strength & Compression testing BS 1377 Parts 5 & 7												
TP / BH No.	Other Id	Sample No	Depth from (m)	Depth to (m)	Moisture Content	Liquid Limit	Plastic Limit	Plasticity index	Plasticity category	Material passing 425um	Linear Shrinkage	Saturated Moisture content	Bulk Density	Dry Density	PSD / Sedimentation	Particle Density	CBR	MCV	Compaction	Point load Axial IS50	Point load Diametral IS50	Triaxial Type	Diameter	Cell Pressure	Corrected Deviator Stress	Undrained Shear Strength	Strain @ Failure	Mode of Failure	Hand Shear Vane *	One Dimensional Consolidation		
					%	%	%	%		%	%	%	Mg/m ³	Mg/m ³		Mg/m ³				MPa	MPa		mm	kPa	kPa	CuKPa	%		kPa			
CP4	D	41174	1			36	17	19	CI	90																						
CP4	B	41175	1.5												X																	
CP4	D	41176	2		12																											
CP4	B	41177	2.5		14								2.16	1.89																		
CP4	D	41178	3																													
CP4	D	41179	3.5			36	19	17	CI	88																						
CP4	D	41180	4																													
CP4	D	41181	4.5												X																	
CP4	B	41182	5																													
CP4	B	41183	5.5		17								2.12	1.81																		
CP4	D	41184	6																													
CP5	D	41185	0.5		16																											
CP5	D	41186	1			37	22	16	CI	88																						
CP5	B	41187	1		17								2.11	1.8																		
CP5	D	41188	1.5		7																											
CP5	B	41189	1.5												X																	
CP5	B	41190	2																													
CP5	B	41191	2.5		7.3								2.04	1.9																		
CP5	D	41192	3																													
CP5	D	41193	3.5			I/S	I/S	I/S	I/S	I/S																						
CP5	D	41194	4																													
CP5	D	41196	5																													
CP5	B	41204	4.5												X																	



Summary of Geotechnical Laboratory results

BH/TP No.	Samprnum	Depth	Laboratory Description	Remarks
TP01	41126	1.2-1.4	Grey Clay / Mudstone	
TP01	41127	2.4-2.6	Grey Clay / Mudstone	
TP02	41128	0.2-0.4	Grey Clay / Mudstone	
TP02	41129	2.5-2.8	Grey Clay / Mudstone	
TP04	41130	0.2-0.4	Grey Clay / Mudstone	
TP04	41131	1.4-1.6	Grey Clay / Mudstone	
TP04	41132	2.4-2.6	Grey Clay / Mudstone	
TP05	41133	1.2-1.4	Grey Clay / Mudstone	
TP07	41134	0.2-0.4	Brown/Grey CLAY	
TP07	41135	2.4-2.6	Grey Clay / Mudstone	
TP13	41136	1.4-1.6	Grey CLAY very friable	
TP13	41137	2.4-2.6	Grey Clay / Mudstone	
TP14	41138	0.1-0.15	Grey Clay / Mudstone	
TP14	41139	1.5-1.7	Grey Clay / Mudstone	
TP16	41140	0.2-0.4	Light Brown CLAY	
TP16	41141	2.1-2.3	Grey Very Friable CLAY	
CP1	41142	0.5	Grey Clay / Mudstone	
CP1	41143	1	Grey Clay / Mudstone	
CP1	41144	1.5	Grey Clay / Mudstone	
CP1	41145	2	Grey Clay / Mudstone	
CP1	41146	2.5	Grey Clay / Mudstone	
CP1	41147	3	Grey Clay / Mudstone	
CP1	41148	3.5	Soft Grey CLAY / mudstone	
CP1	41149	4	Grey Clay / Mudstone	
CP1	41150	5	Grey Clay / Mudstone	
CP1	41151	5.7	Soft Grey CLAY	
CP2	41152	0.5	Grey Clay / Mudstone	
CP2	41153	1	Grey Clay / Mudstone	
CP2	41154	1.5	Grey Clay / Mudstone	

Summary of Geotechnical Laboratory results

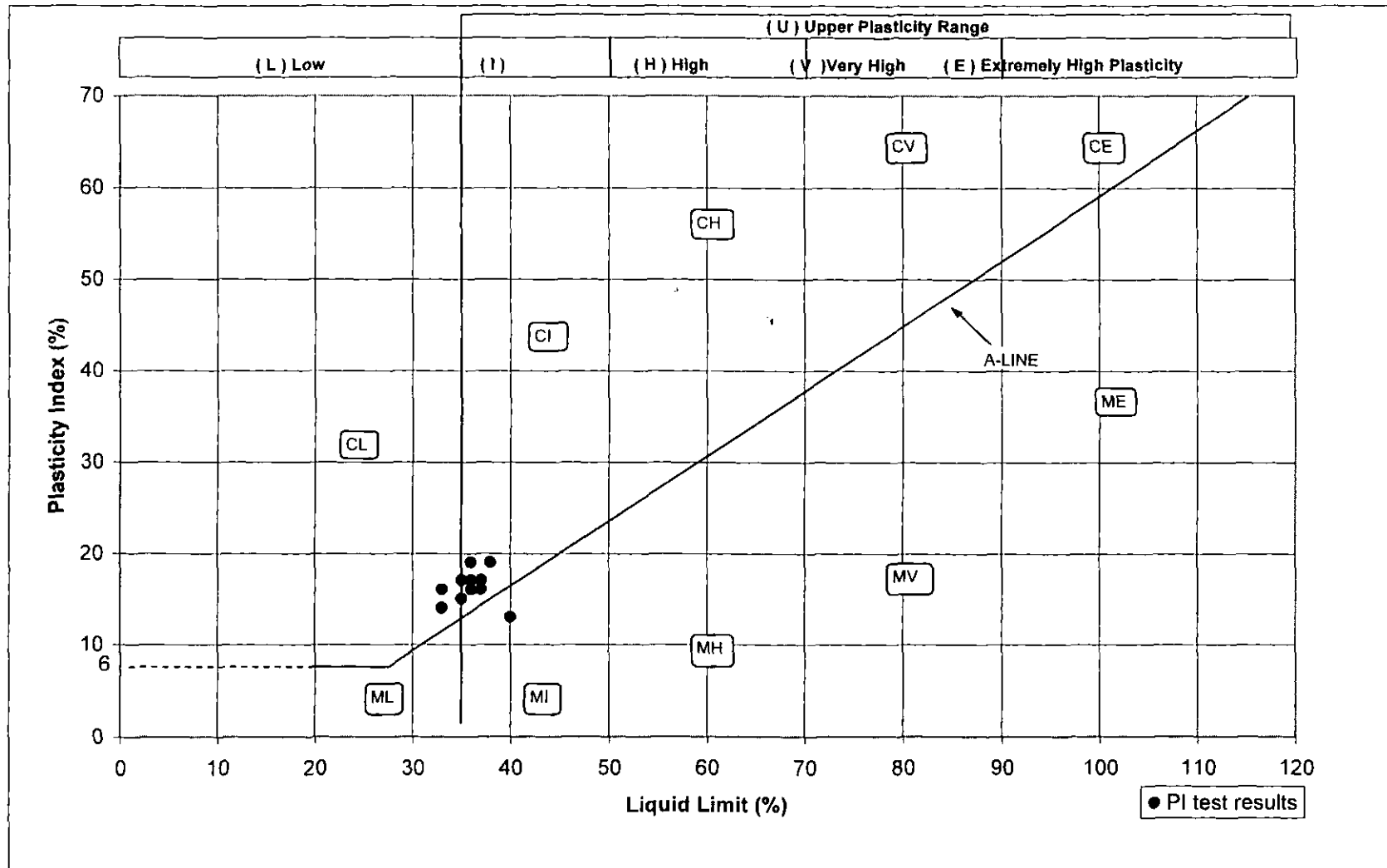
BH/TP No.	Sample No.	Depth	Laboratory Description	Remarks
CP2	41155	2	Firm Grey Slightly Gravelly CLAY	
CP2	41156	2.5	Grey Clay / Mudstone	
CP2	41157	3	Grey Clay / Mudstone	
CP2	41158	3.5	Grey Clay / Mudstone	
CP2	41159	4	Soft Grey Gravelly (Mudstone)CLAY	
CP2	41160	5	Grey Clay / Mudstone	
CP2	41161	5.5	Grey Clay / Mudstone	
CP3	41162	0.5	Firm Grey/Pale Brown, Slightly Sandy Gravelly CLAY	
CP3	41163	1	Grey Clay / Mudstone	
CP3	41164	1.5	Grey Clay / Mudstone	
CP3	41165	2	Grey Clay / Mudstone	
CP3	41166	2.5	Grey Clay / Mudstone	
CP3	41167	2.5	soft grey CLAY / SANDSTONE	
CP3	41168	3	Grey Clay / Mudstone	
CP3	41169	3.5	Grey Clay / Mudstone'	
CP3	41170	3.5	Grey Clay / Mudstone	
CP3	41171	4.5	Grey Clay / Mudstone	
CP3	41172	5.5	soft grey CLAY / SANDSTONE	
CP4	41173	0.5	Grey Clay / Mudstone	
CP4	41174	1	Grey CLAY with occ Gravel	
CP4	41175	1.5	soft grey CLAY / SANDSTONE	
CP4	41176	2	Grey Clay / Mudstone	
CP4	41177	2.5	Grey Clay / Mudstone	
CP4	41178	3	Grey Clay / Mudstone	
CP4	41179	3.5	Grey Clay / Mudstone	
CP4	41180	4	Grey Clay / Mudstone	
CP4	41181	4.5	soft-firm grey CLAY / SANDSTONE	
CP4	41182	5	Grey Clay / Mudstone	
CP4	41183	5.5	Grey Clay / Mudstone	

Summary of Geotechnical Laboratory results

BH/TP No.	Sample No.	Depth	Laboratory Description	Remarks
CP4	41184	6	Grey Clay / Mudstone	
CP5	41185	0.5	Grey Clay / Mudstone	
CP5	41186	1	Firm Grey/Black, occasional fine gravel CLAY	
CP5	41187	1	Grey Clay / Mudstone	
CP5	41188	1.5	Grey Clay / Mudstone	
CP5	41189	1.5	Grey Clay / Mudstone	
CP5	41190	2	Grey Clay / Mudstone	
CP5	41191	2.5	Grey Clay / Mudstone	
CP5	41192	3	Grey Clay / Mudstone	
CP5	41193	3.5	Grey Clay / Mudstone	
CP5	41194	4	Grey Clay / Mudstone	
CP5	41196	5	Grey Clay / Mudstone	
CP5	41204	4.5	Grey Clay / Mudstone	

PLASTICITY CHART from BS5930 : 2000

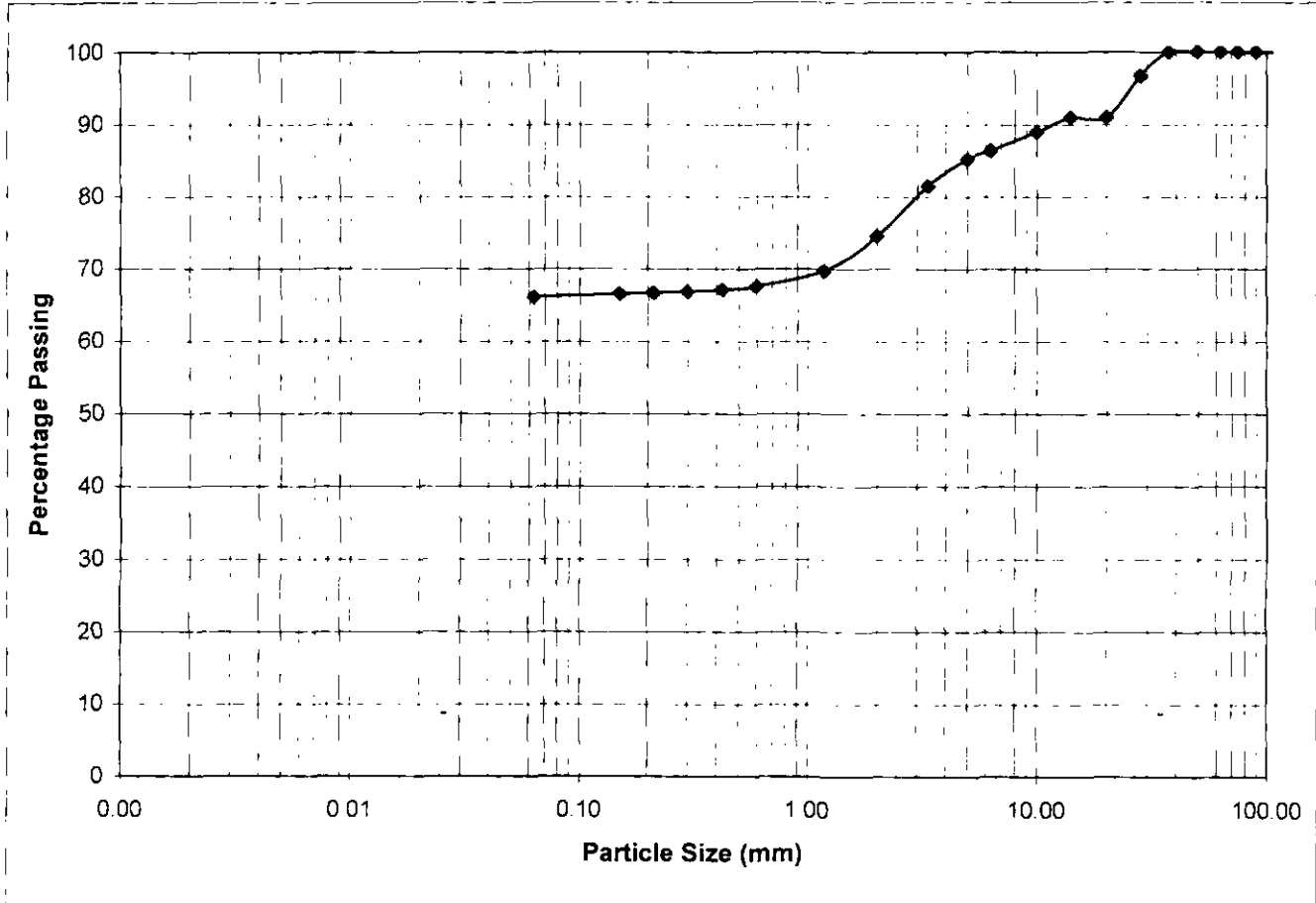
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Unit 5, Centurion Business Park
Dabell Avenue, Bulwell
Nottingham, NG6 8WA



PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: CL9.2 1990



PROJECT	Grimethorpe	SAMPLE	TP04 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	1 4-1.6	SAMPNUM	41131



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	96.73
20.00	91.03
14.00	91.03
10.00	88.96
6.300	86.43
5.000	85.22
3.350	81.49
2.000	74.54
1.180	69.82
0.600	67.55
0.425	67.17
0.300	66.92
0.212	66.76
0.150	66.59
0.063	66.16

PARTICLE DIAMETER (mm)	% PASSING
2.00	74.54
0.063	66.16

SOIL FRACTION	TOTAL %
GRAVEL	25.46
SAND	8.38
SILT OR CLAY	66.16

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

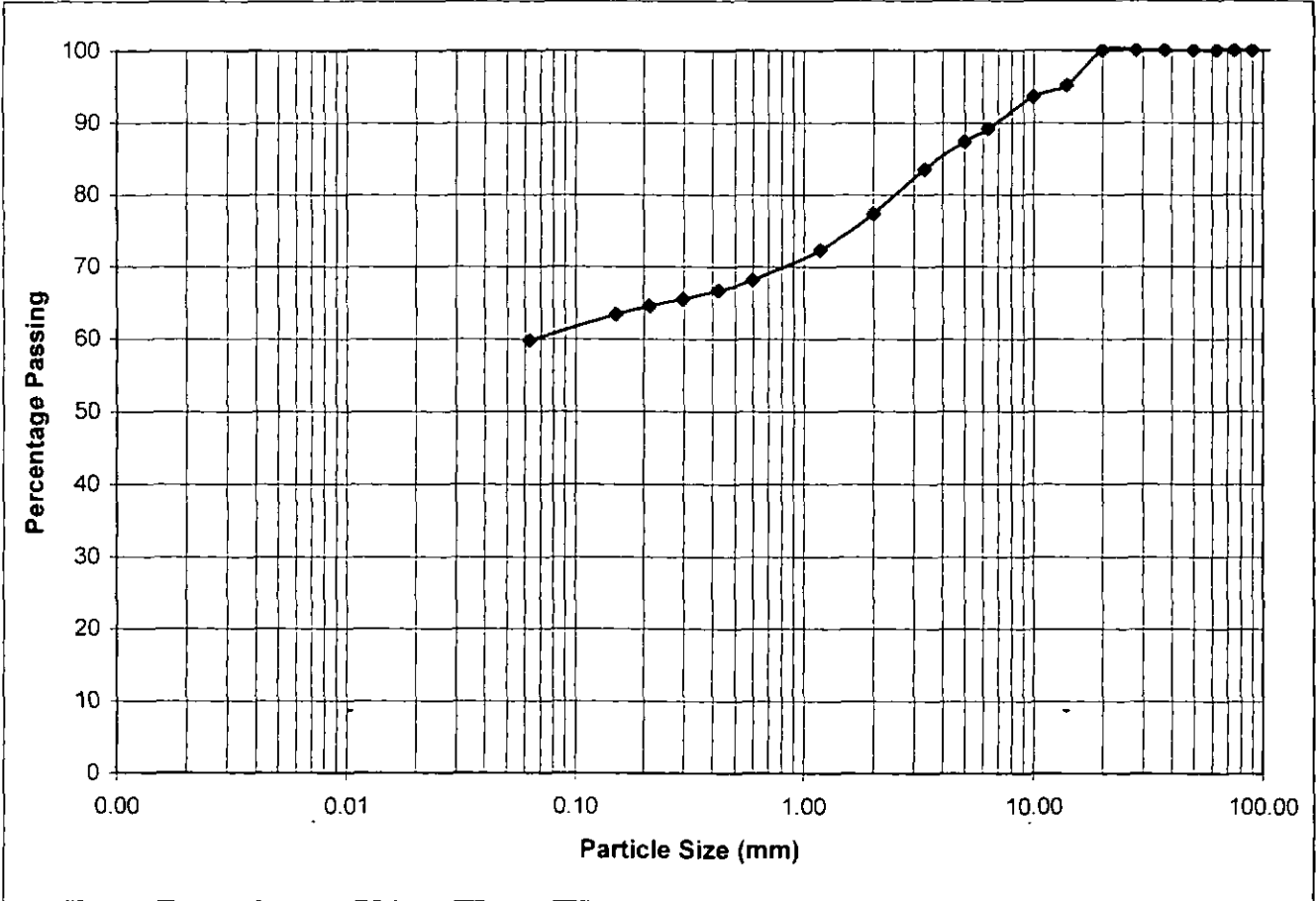
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PROJECT	Grimethorpe	SAMPLE	TP07 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	2.4-2.6	SAMPNUM	41135



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	100.00
14.00	95.15
10.00	93.55
6.300	89.13
5.000	87.35
3.350	83.55
2.000	77.33
1.180	72.34
0.600	68.16
0.425	66.76
0.300	65.57
0.212	64.62
0.150	63.45
0.063	59.80

PARTICLE DIAMETER (mm)	% PASSING	SOIL FRACTION	TOTAL %
2.00	77.33	GRAVEL	22.67
0.063	59.80	SAND	17.53
		SILT OR CLAY	59.80

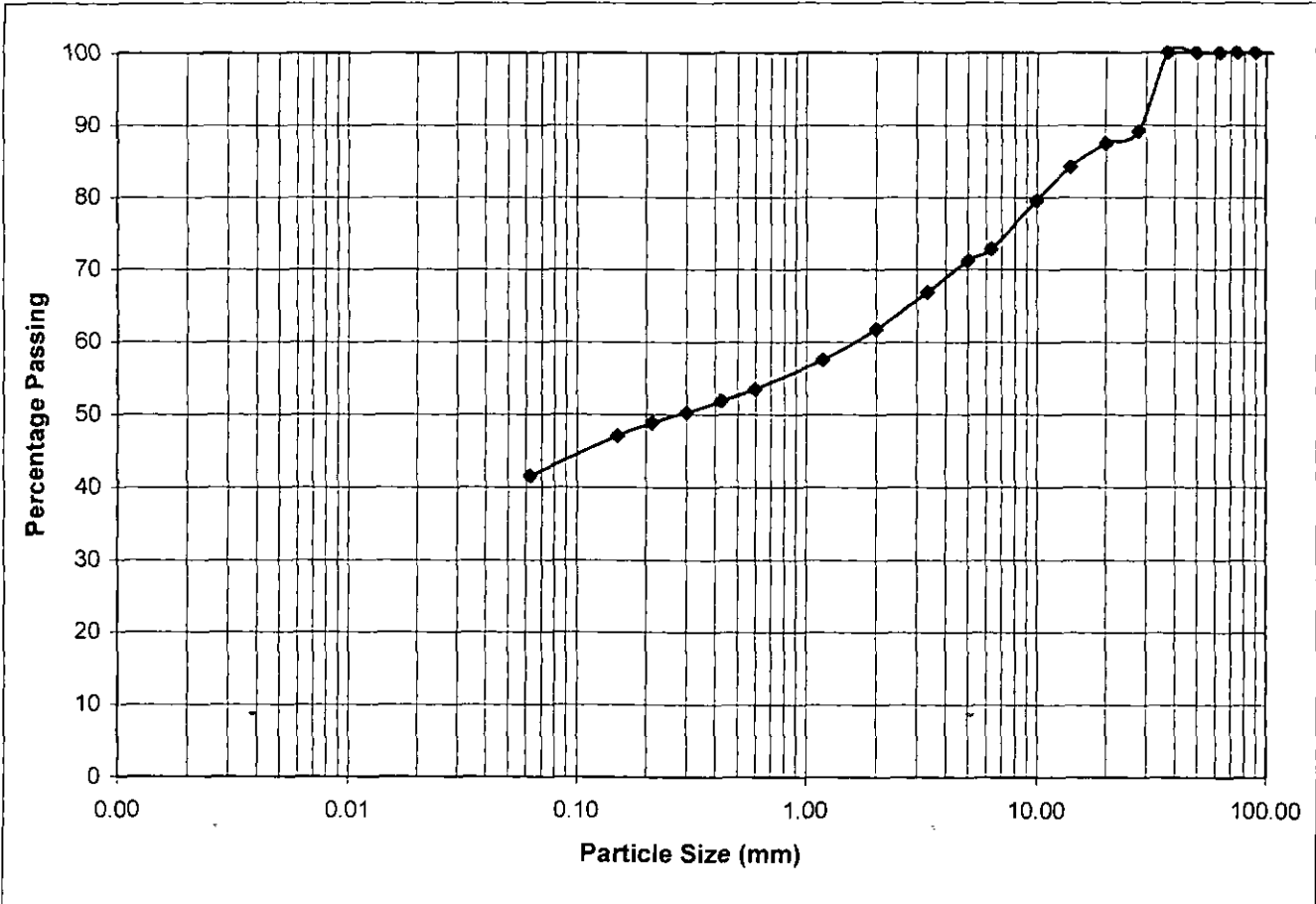
Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

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PROJECT	Grimethorpe	SAMPLE	TP14 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	0.1-0.15	SAMPNUM	41138



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	89.12
20.00	87.47
14.00	84.18
10.00	79.55
6.300	72.86
5.000	71.19
3.350	66.91
2.000	61.76
1.180	57.52
0.600	53.50
0.425	51.86
0.300	50.29
0.212	48.84
0.150	47.02
0.063	41.49

PARTICLE DIAMETER (mm)	% PASSING	SOIL FRACTION	TOTAL %
2.00	61.76	GRAVEL	38.24
0.063	41.49	SAND	20.27
		SILT OR CLAY	41.49

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

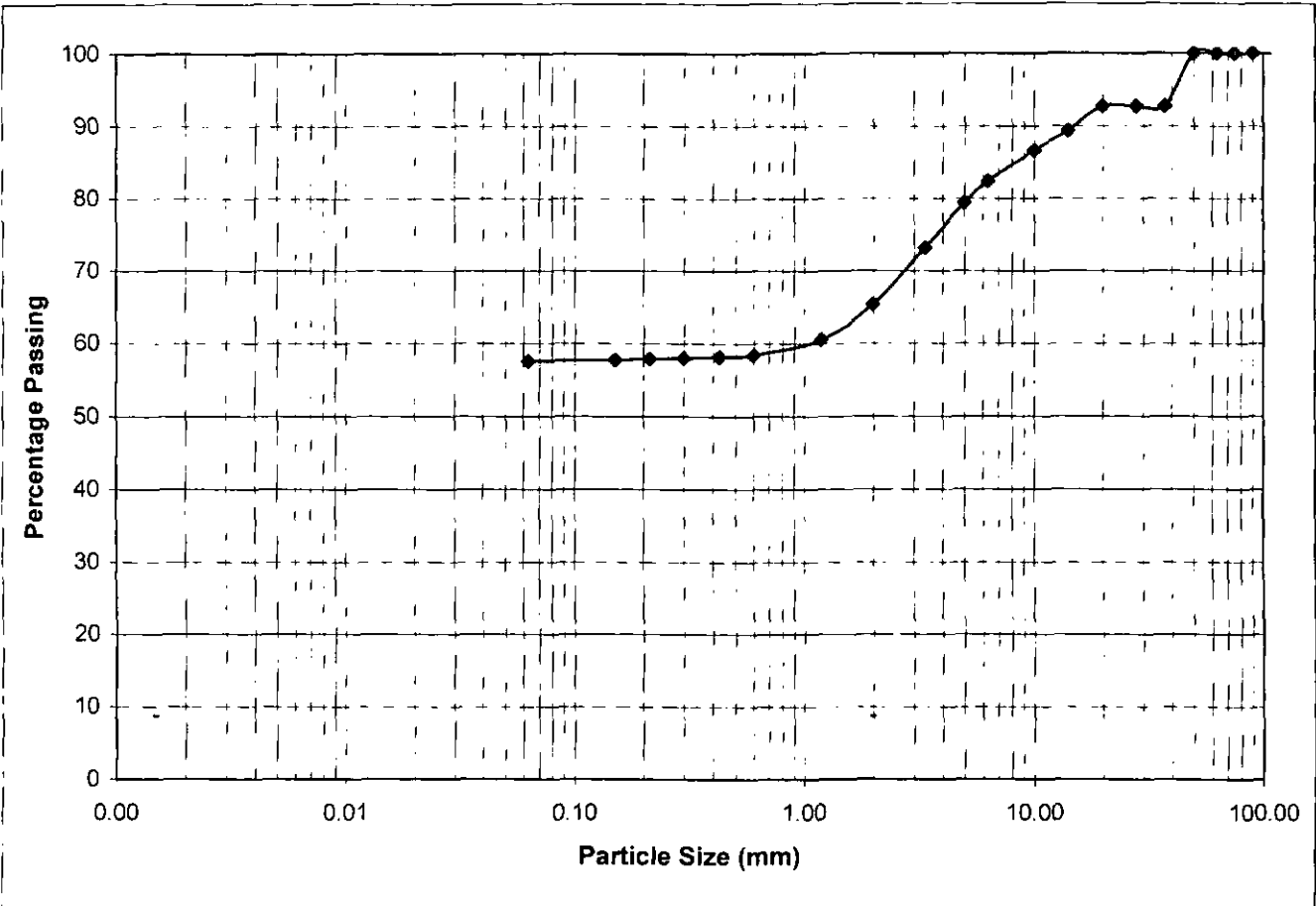
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PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: CL9.2 1990



PROJECT	Grimethorpe	SAMPLE	TP14 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	1.5-1.7	SAMPNUM	41139



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	92.68
28.00	92.68
20.00	92.68
14.00	89.29
10.00	86.61
6.300	82.36
5.000	79.36
3.350	73.20
2.000	65.36
1.180	60.53
0.600	58.44
0.425	58.15
0.300	57.96
0.212	57.87
0.150	57.76
0.063	57.60

PARTICLE DIAMETER (mm)	% PASSING
2.00	65.36
0.063	57.60

SOIL FRACTION	TOTAL %
GRAVEL	34.64
SAND	7.76
SILT OR CLAY	57.60

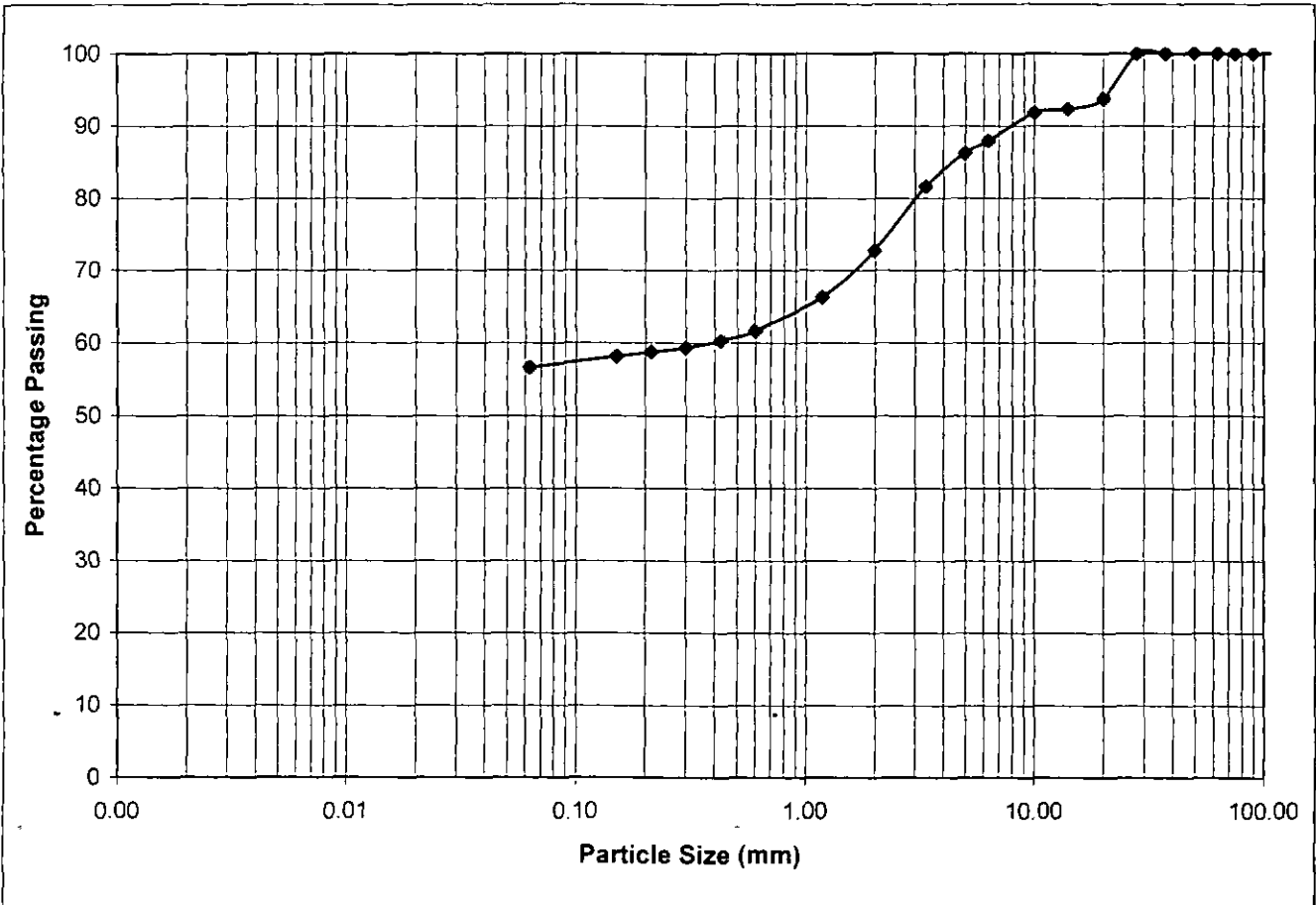
Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

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PROJECT	Grimethorpe	SAMPLE	CP1 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	3.5	SAMPNUM	41148



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	93.69
14.00	92.25
10.00	91.80
6.300	87.83
5.000	86.17
3.350	81.61
2.000	72.75
1.180	66.28
0.600	61.60
0.425	60.25
0.300	59.31
0.212	58.72
0.150	58.17
0.063	56.64

PARTICLE DIAMETER (mm)	% PASSING
2.00	72.75
0.063	56.64

SOIL FRACTION	TOTAL %
GRAVEL	27.25
SAND	16.11
SILT OR CLAY	56.64

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

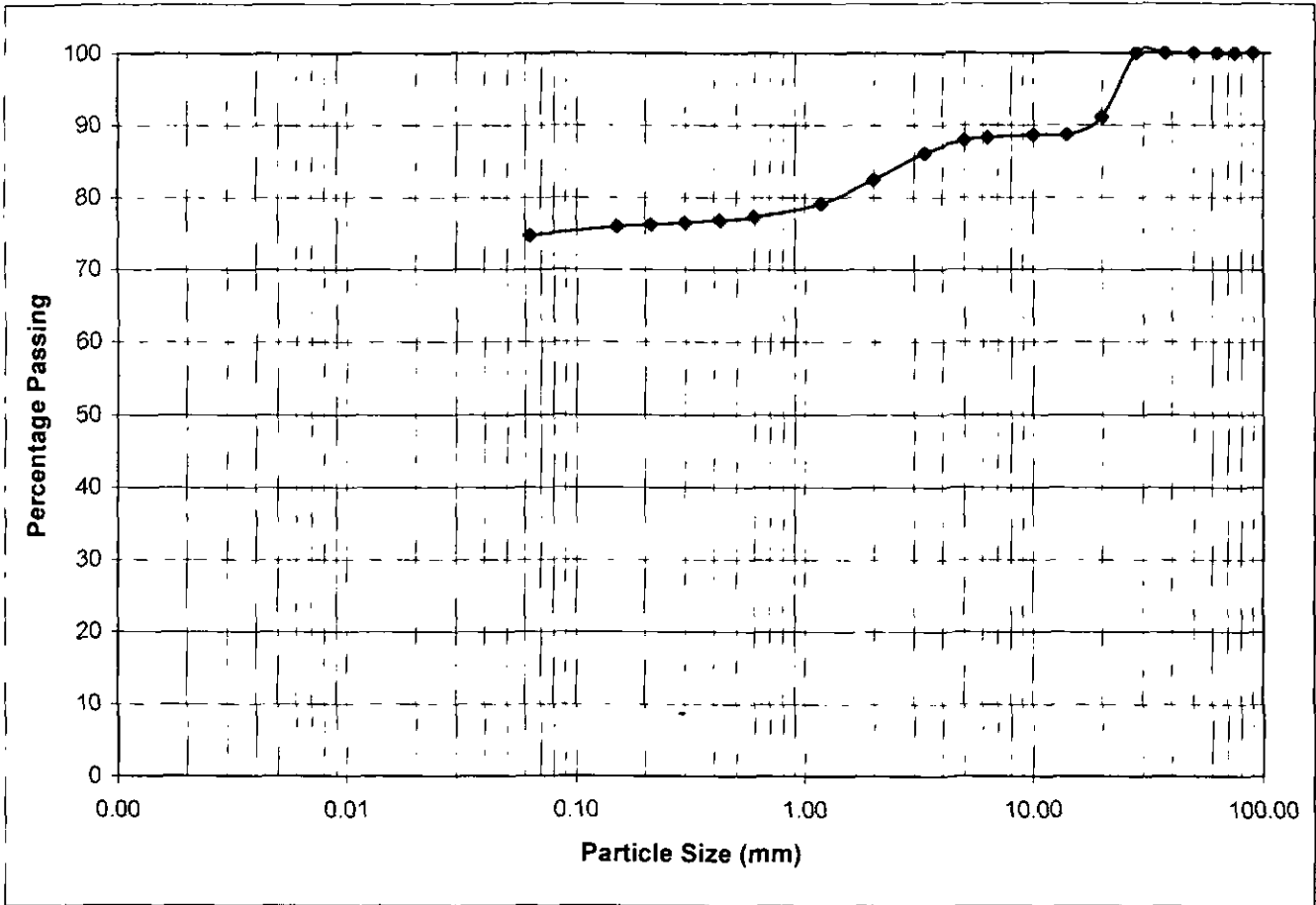
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PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: CL9.2 1990



PROJECT	Grimethorpe	SAMPLE	CP2 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	3.5	SAMPNUM	41158



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	91.12
14.00	88.59
10.00	88.59
6.300	88.17
5.000	87.85
3.350	86.11
2.000	82.42
1.180	79.15
0.600	77.22
0.425	76.80
0.300	76.48
0.212	76.25
0.150	75.97
0.063	74.68

PARTICLE DIAMETER (mm)	% PASSING	SOIL FRACTION	TOTAL %
2.00	82.42	GRAVEL	17.58
0.063	74.68	SAND	7.74
		SILT OR CLAY	74.68

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

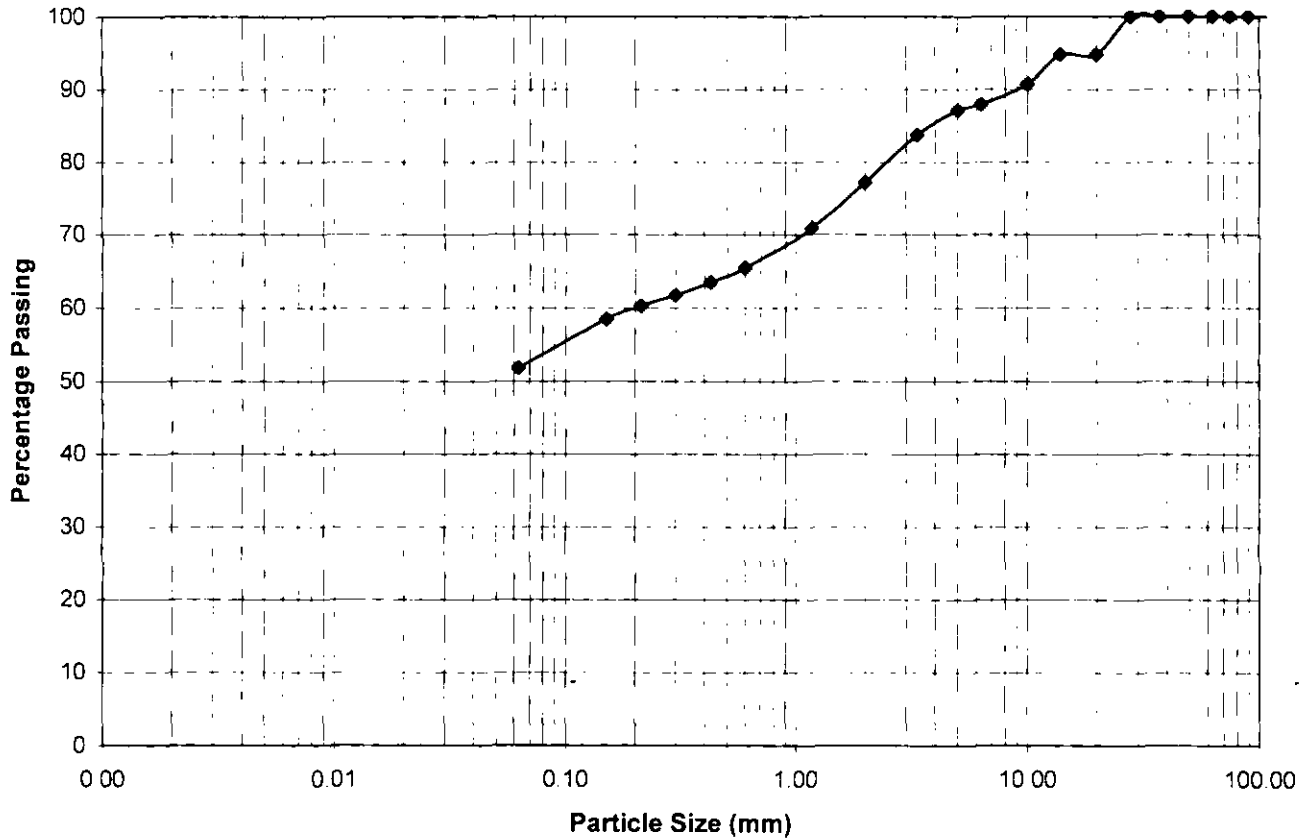
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Nottingham, NG6 8WA
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PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: CL9.2 1990



PROJECT	Grimethorpe	SAMPLE	CP3 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	2.5	SAMPNUM	41167



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	94.72
14.00	94.72
10.00	90.66
6.300	87.89
5.000	87.11
3.350	83.73
2.000	77.19
1.180	70.92
0.600	65.44
0.425	63.49
0.300	61.72
0.212	60.31
0.150	58.45
0.063	51.80

PARTICLE DIAMETER (mm)	% PASSING
2.00	77.19
0.063	51.80

SOIL FRACTION	TOTAL %
GRAVEL	22.81
SAND	25.39
SILT OR CLAY	51.80

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

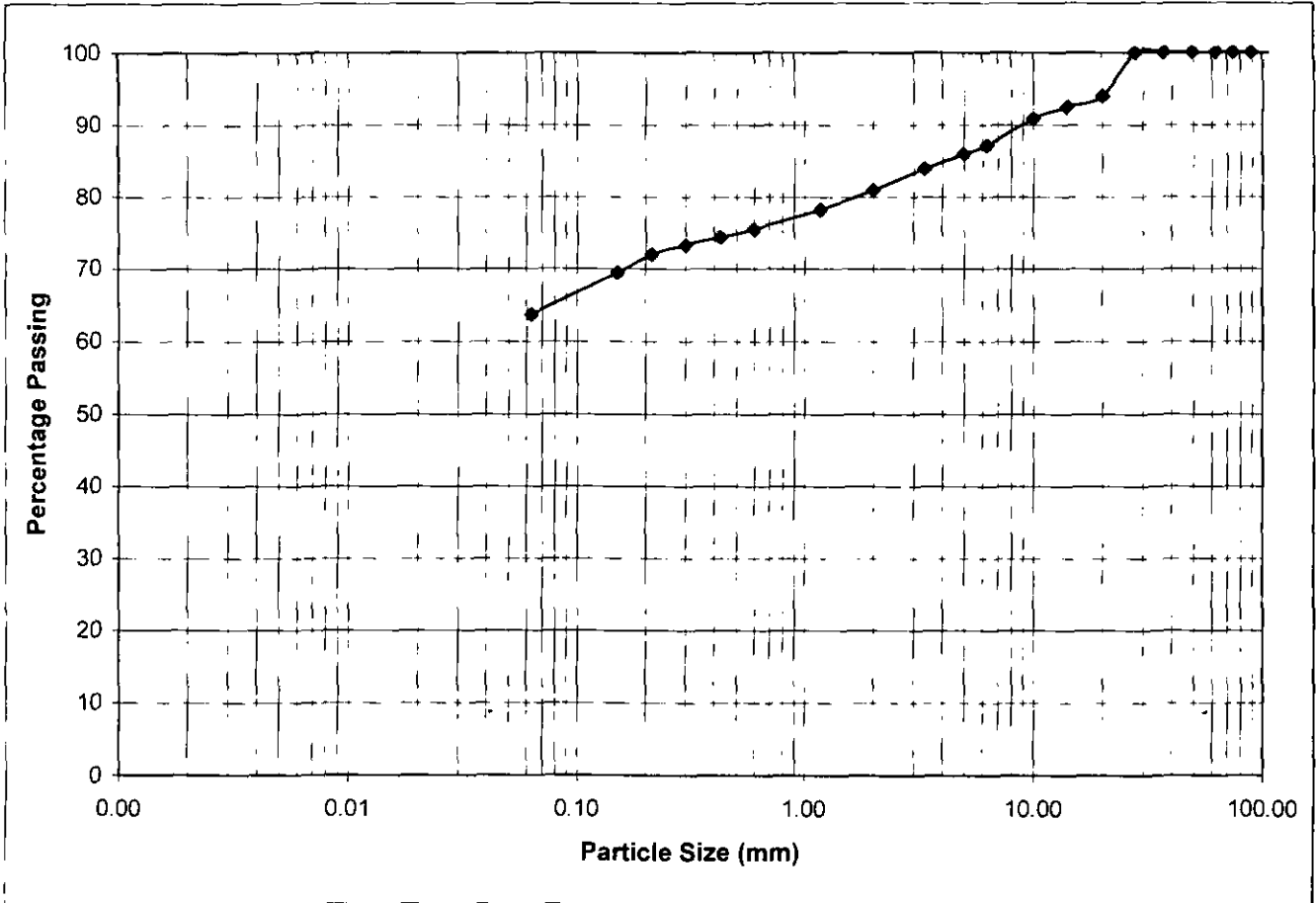
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Dabell Avenue, Butwell
Nottingham, NG6 8WA
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PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: CL9.2 1990



PROJECT	Grimethorpe	SAMPLE	CP3 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	5.5	SAMPNUM	41172



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	93.97
14.00	92.43
10.00	90.83
6.300	87.08
5.000	85.89
3.350	83.91
2.000	80.90
1.180	78.21
0.600	75.50
0.425	74.38
0.300	73.29
0.212	71.95
0.150	69.42
0.063	63.63

PARTICLE DIAMETER (mm)	% PASSING	SOIL FRACTION	TOTAL %
2.00	80.90	GRAVEL	19.10
0.063	63.63	SAND	17.27
		SILT OR CLAY	63.63

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

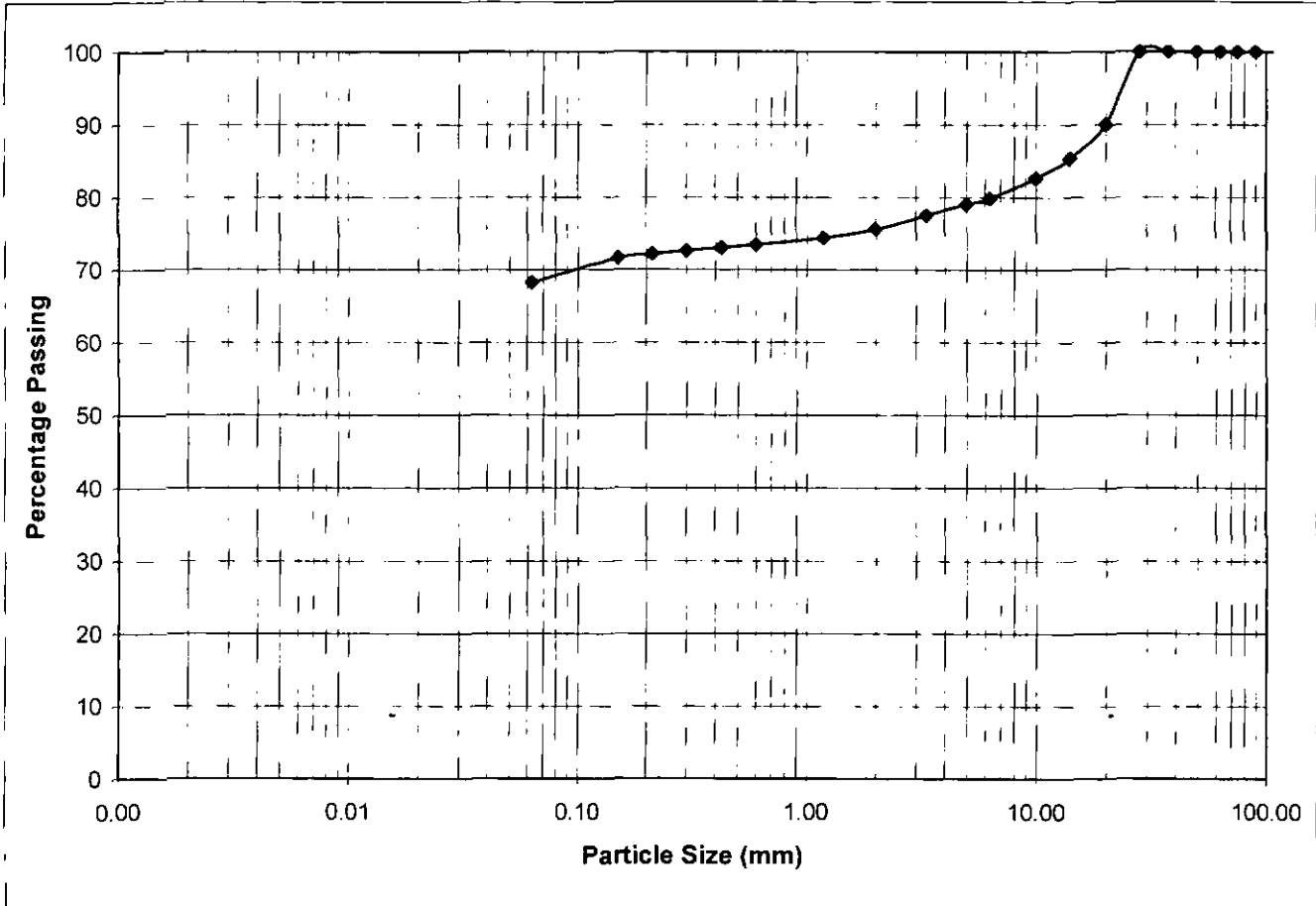
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ISSUE 1 REV 1 RP05 30/08/05



PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: CL9.2 1990



PROJECT	Grimethorpe	SAMPLE	CP4 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	1.5	SAMPNUM	41175



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	89.94
14.00	85.31
10.00	82.56
6.300	79.82
5.000	79.07
3.350	77.52
2.000	75.59
1.180	74.39
0.600	73.40
0.425	73.01
0.300	72.59
0.212	72.19
0.150	71.62
0.063	68.27

PARTICLE DIAMETER (mm)	% PASSING
2.00	75.59
0.063	68.27

SOIL FRACTION	TOTAL %
GRAVEL	24.41
SAND	7.32
SILT OR CLAY	68.27

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

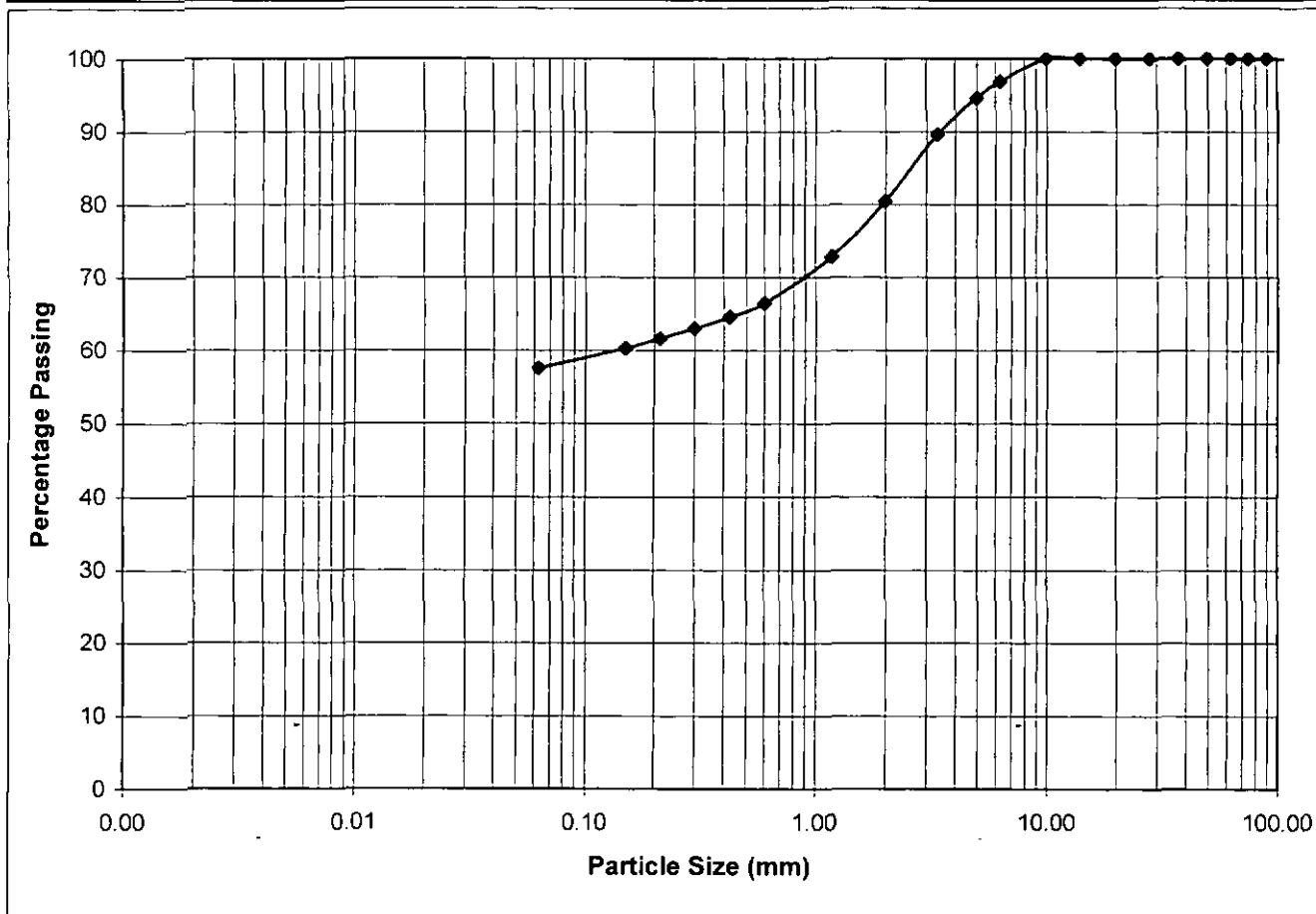
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PARTICLE SIZE DISTRIBUTION TEST: BS1377: PART 2: CL9:2 1991



PROJECT	Grimethorpe	SAMPLE	CP4 D	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	4.5	SAMPNUM	41181



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	100.00
20.00	100.00
14.00	100.00
10.00	100.00
6.300	96.83
5.000	94.60
3.350	89.54
2.000	80.36
1.180	72.81
0.600	66.47
0.425	64.58
0.300	62.95
0.212	61.66
0.150	60.29
0.063	57.55

PARTICLE DIAMETER (mm)	% PASSING
2.00	80.36
0.063	57.55

SOIL FRACTION	TOTAL %
GRAVEL	19.64
SAND	22.81
SILT OR CLAY	57.55

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

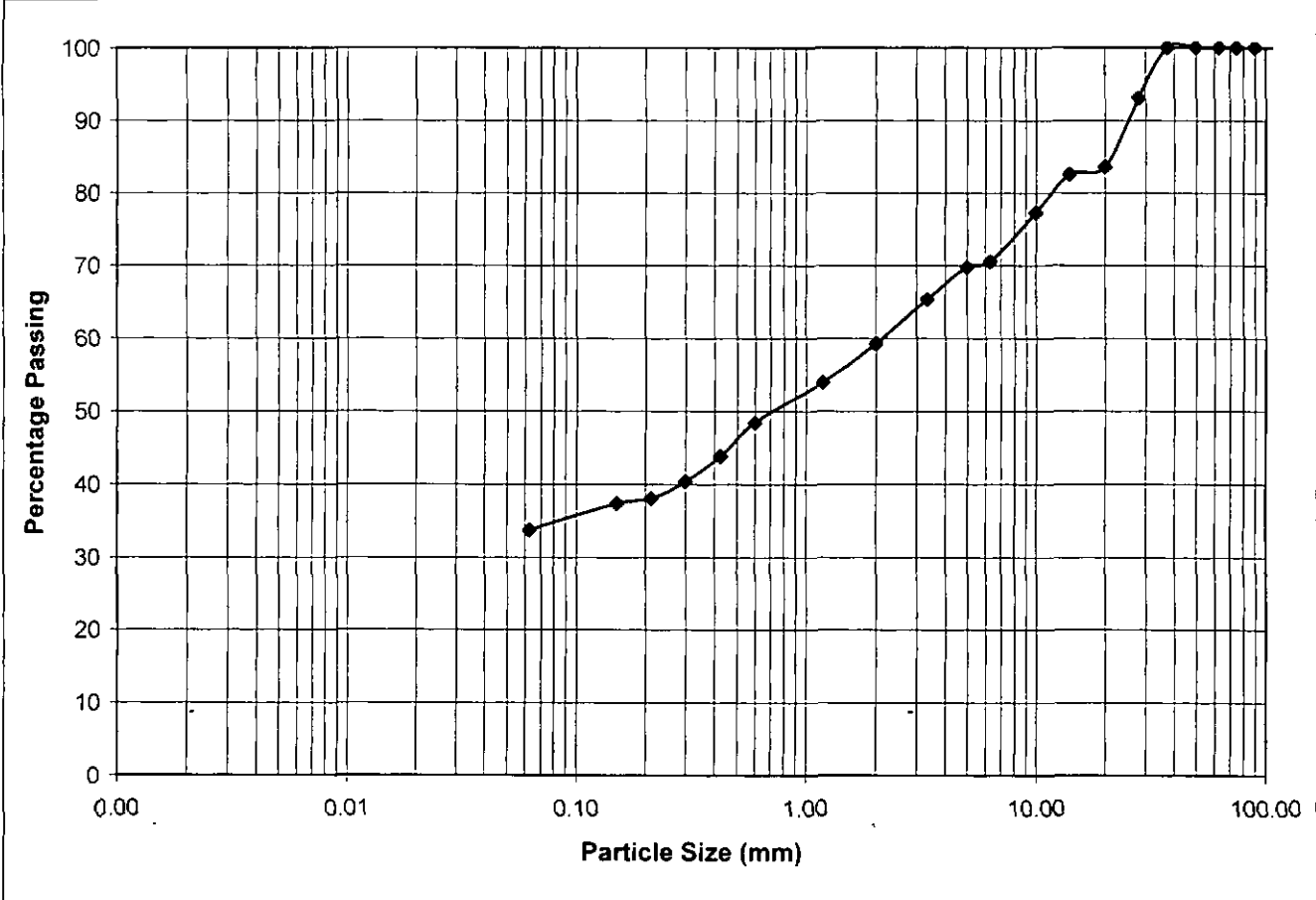
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PARTICLE SIZE DISTRIBUTION TEST: BS1377: PART 2: CL9.2: 1991



PROJECT	Grimethorpe	SAMPLE	CP5 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	1.5	SAMPNUM	41189



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	93.07
20.00	83.51
14.00	82.55
10.00	77.24
6.300	70.55
5.000	69.75
3.350	65.33
2.000	59.26
1.180	53.87
0.600	48.37
0.425	43.83
0.300	40.32
0.212	38.07
0.150	37.36
0.063	33.74

PARTICLE DIAMETER (mm)	% PASSING
2.00	59.26
0.063	33.74

SOIL FRACTION	TOTAL %
GRAVEL	40.74
SAND	25.52
SILT OR CLAY	33.74

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

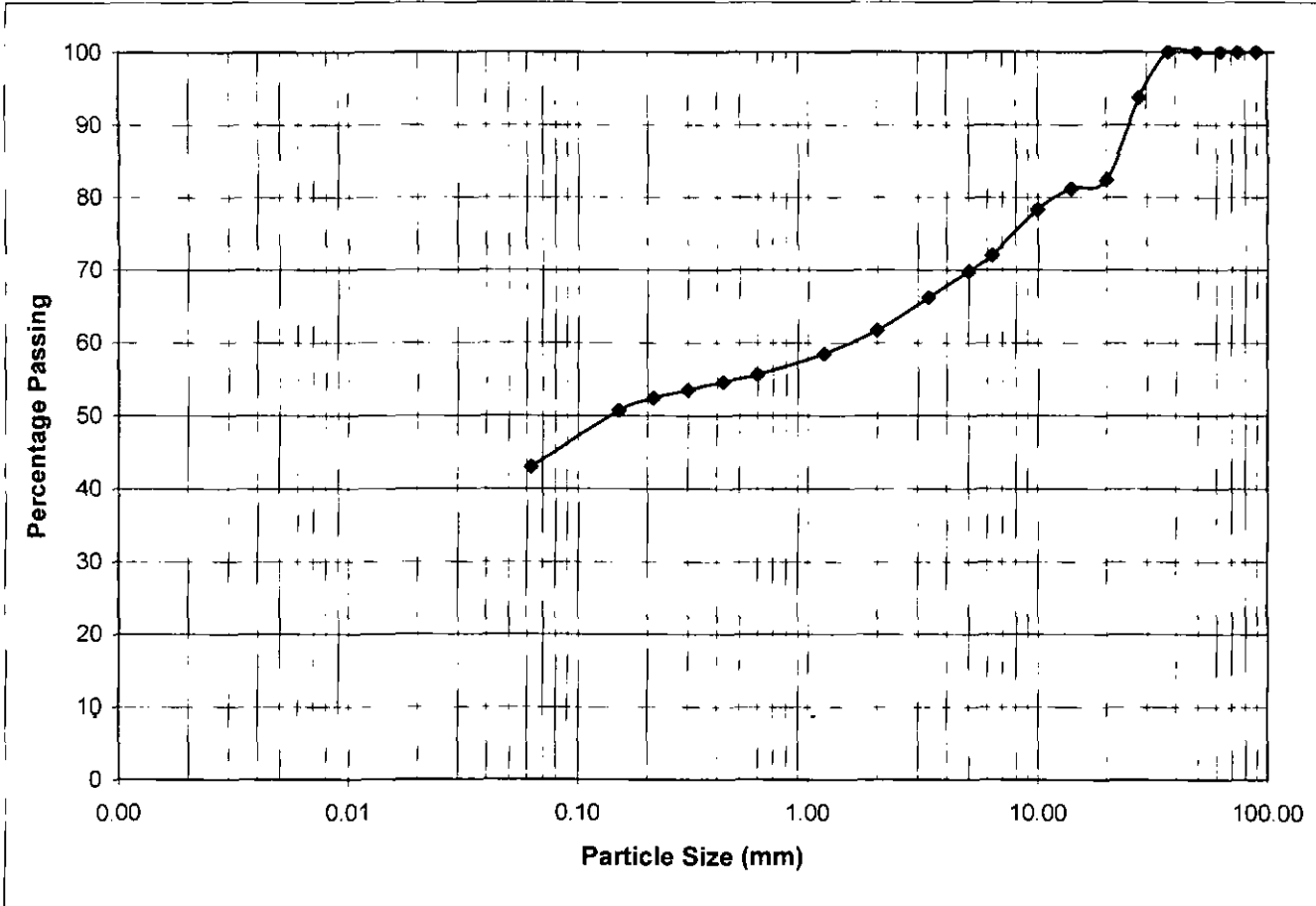
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PARTICLE SIZE DISTRIBUTION TEST : BS1377 : PART 2: CL9.2 1991



PROJECT	Grimethorpe	SAMPLE	CP5 B	JOB NO	08-02961
PROJECT NUMBER	12191056 001	DEPTH(m)	4.5	SAMPNUM	41204



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

SIEVE SIZE	% PASSING
125.00	100.00
90.00	100.00
75.00	100.00
63.00	100.00
50.00	100.00
37.50	100.00
28.00	93.70
20.00	82.34
14.00	81.12
10.00	78.23
6.300	71.99
5.000	69.81
3.350	66.18
2.000	61.75
1.180	58.46
0.600	55.57
0.425	54.56
0.300	53.52
0.212	52.41
0.150	50.65
0.063	42.95

PARTICLE DIAMETER (mm)	% PASSING
2.00	61.75
0.063	42.95

SOIL FRACTION	TOTAL %
GRAVEL	38.25
SAND	18.79
SILT OR CLAY	42.95

Tested by / date DP 7/3/08

NOTES:
* SIZE PARTICLES ABOVE 60mm CLASSIFY AS COBBLES

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**APPENDIX G:
CONCRETE CLASSIFICATION SUMMARY TABLE**

	Acid Soluble Sulphate	Water Soluble Sulphate	Concrete Class	Total Sulphur Solid	Total potential sulfate	Concrete Class	oxidisable sulfides
	AS (% SO4)	WS (mg/l SO4)		TS (% S)	TPS % SO4 = 3 x TS(% S)		OS % SO4 = TPS % SO4 - AS %
TOP 20% VALUES	1.04	440	DS-1	0.49			
	0.14	260	DS-1	0.38			
	0.12	130	DS-1	0.29			
MEAN OF TOP 20%	0.43	276.67	DS-1	0.39	1.16	DS-3	0.72666667

APPENDIX H:
APEX GEOSERVICES (UK) LTD GEOPHYSICAL SURVEY REPORT



DRAFT REPORT ON PHASE III OF A GEOPHYSICAL SURVEY

AT

HOUGHTON MAIN BUSINESS PARK

NEAR

GREAT HOUGHTON, SOUTH YORKSHIRE

FOR

WHITE YOUNG GREEN ENVIRONMENTAL

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PRIVATE AND CONFIDENTIAL

THE FINDINGS OF THIS REPORT ARE THE RESULT OF A GEOPHYSICAL SURVEY USING NON-INVASIVE SURVEY TECHNIQUES CARRIED OUT AT THE GROUND SURFACE. INTERPRETATIONS CONTAINED IN THIS REPORT ARE DERIVED FROM A KNOWLEDGE OF THE GROUND CONDITIONS, THE GEOPHYSICAL RESPONSES OF GROUND MATERIALS AND THE EXPERIENCE OF THE AUTHOR. APEX GEOSERVICES LTD. HAS PREPARED THIS REPORT IN LINE WITH BEST CURRENT PRACTICE AND WITH ALL REASONABLE SKILL, CARE AND DILIGENCE IN CONSIDERATION OF THE LIMITS IMPOSED BY THE SURVEY TECHNIQUES USED AND THE RESOURCES DEVOTED TO IT BY AGREEMENT WITH THE CLIENT. THE INTERPRETATIVE BASIS OF THE CONCLUSIONS CONTAINED IN THIS REPORT SHOULD BE TAKEN INTO ACCOUNT IN ANY FUTURE USE OF THIS REPORT.

AUTHOR	CHECKED	REPORT STATUS	DATE
DAVID CARPENTER BA, CGEOL, FGS	PETER JACKSON BSC	DRAFT	MAY 2008

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APPENDIX I METHODS

MAPS

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Map 2	Geophysical Survey Locations & Interpretation (Part 2)

FIGURES

Figure 1	Geophysical Section A
Figure 2	Geophysical Section B
Figure 3	Geophysical Section C
Figure 4	Geophysical Section D
Figure 5	Geophysical Section E
Figure 6	Geophysical Section F
Figure 7	Geophysical Section G
Figure 8	Geophysical Section H
Figure 9	Geophysical Section J
Figure 10	Geophysical Section K

1. INTRODUCTION

APEX Geoservices (UK) Ltd. was requested by White Young Green Environmental Ltd to investigate a landfilled former opencast coal site which is to be redeveloped as a business park. Field work was carried out between the 14th and 15th February 2008.

Additional work was carried out at the site on 3rd April 2008, and a third phase on the 29th April 2008.

Survey References: Phase I - AGLUK08001; Phase II - AGLUK08014.; Phase III - AGLUK08021.

1.1 Survey Objectives

The objective of the survey was:

- ❖ To map the highwall of a former opencast pit.

1.1 Survey Methodology

Phase I: 4 (No) Geophysical Sections (A - D)

Phase II: 3 (No) Geophysical Sections (E - G)

Phase III: 4 (No) Geophysical Sections (H - K, plus repeat of C)

comprising a total of:

- ❖ 11 (No) Seismic Refraction Profiles
- ❖ 12 (No) 2D Resistivity Imaging Profiles

1.3 Site Background

The site is located adjacent to the A6195, Park Spring Road approximately 1.0km to the west of Great Houghton, near Bamsley, South Yorkshire. Grid Ref: SE 417 064.

Originally part of Houghton Main colliery, the site was subsequently opencast mined, and backfilled with spoil, and is to be redeveloped as a business park.

The BGS 1:50,000 map covering the site (Sheet 87, Bamsley S&D) describes the solid geology of the site as Upper Carboniferous Coal Measures. The Mexborough Rock (sandstone) lies to the west of the site, and the Ackworth Rock (sandstone) lies to the east of the site. Overlying the bedrock within the western edges of the site are alluvial deposits associated with the nearby River Deame.

1.4 Report Outline

- ❖ The survey results are interpreted in Section 2.
- ❖ Summary and Recommendations are contained in Section 3.
- ❖ The Geophysical Survey Locations and Interpretation are shown on Map 1.
- ❖ The Interpreted Resistivity Imaging Profiles with the Seismic Refraction results are shown in Figures 1 - 10.
- ❖ Details of the methodology used are given in Appendix I.

2. RESULTS

The range of resistivities observed on site was 10 – 1416 ohm m.

The range of seismic P-wave velocities observed on site was 244 – 1957 m/s.

The geophysical data were interpreted using the following criteria:

Seismic P-wave velocity (m/s)	Resistivity range (ohm m)	Interpretation
250 - 500	10 - 60	Soil / loose fill
500 - 1100	10 - 80	Fill of Coal Measures Spoil
> 1400	80 – 250	In-situ Coal Measures

For Phase I, initially, four 2D Resistivity Imaging profiles were planned, with four corresponding seismic refraction profiles. However, it was decided on-site that a fifth profile was required in order to extend the coverage of Geophysical Section C to ensure that the highwall had been crossed. Resistivity Profile 2 showed a clear indication of the location of the highwall, and was thus used as a bench-mark for the interpretation.

Geophysical Section A comprised 2D Resistivity Imaging Profile R1 and Seismic Refraction Profile S3. Geophysical Section B comprised 2D Resistivity Imaging Profile R2 and Seismic Refraction Profile S2. Geophysical Section C comprised 2D Resistivity Imaging Profiles R3 & R5 and Seismic Refraction Profile S1.

Geophysical Section D comprised 2D Resistivity Imaging Profile R4 and Seismic Refraction Profile S4.

Phase II comprised a further three geophysical sections of one seismic refraction and one 2D Resistivity Imaging profile each.

Geophysical Section E comprised 2D Resistivity Imaging Profile R6 and Seismic Refraction Profile S5. Geophysical Section F comprised 2D Resistivity Imaging Profile R7 and Seismic Refraction Profile S6. Geophysical Section G comprised 2D Resistivity Imaging Profile R8 and Seismic Refraction Profile S7.

Phase III comprised three additional geophysical sections and an overlapping continuation of Section C extending the coverage to the banks of the River Deame. Each of the four geophysical sections included a 2D Resistivity Imaging profile, and a seismic refraction profile. A 4m electrode spacing was employed for the resistivity profiles in order to increase the coverage, and investigate deeper.

Geophysical Section C (extended) comprised 2D Resistivity Imaging Profile R9 and Seismic Refraction Profile S8.

Geophysical Section H comprised 2D Resistivity Imaging Profile R10 and Seismic Refraction Profile S9.

Geophysical Section J comprised 2D Resistivity Imaging Profile R11 and Seismic Refraction Profile S10.

Geophysical Section K comprised 2D Resistivity Imaging Profile R12 and Seismic Refraction Profile S11.

Geophysical Section A

This section was located in the central and northern part of the site and crossed a bund between the edge of the site and a disused railway.

The observed resistivities (2D Resistivity Profile R1) were generally in the range of 10 – 80 ohm m (interpreted as backfill material), but higher resistivities (> 80 ohm m) were observed near the base of the profile towards the edge of the backfilled opencast area.

Seismic Refraction Profile S3 indicated a four-layer model with a low velocity surface layer (441 m/s) interpreted as soil or loose fill, over the bund, and extending to approximately 2m over the leveled part of the site. The underlying seismic layers indicated a gradual increase in velocity from 1050 – 1200 m/s as might be expected from compacted landfill. The seismic layers indicated an upward gradient towards the edge of the backfilled area which was coincident with the higher resistivity zone.

The higher resistivity zone (> 80 ohm m) and the upward gradient of the seismic layers has been interpreted as the location of the highwall in this area.

Geophysical Section B

This section was located in the north-west of the site, and was over flat ground.

An obvious increase in resistivity was seen towards the edge of the backfilled area and at the base of 2D Resistivity Profile 2. This has been interpreted as the boundary between backfill and in-situ coal measures, and was therefore used to interpret the other resistivity profiles.

Seismic Refraction profile S2 indicated a three layer model with soil/loose fill within an apparent surface depression on the edge of the backfilled area (561 m/s), and compacted material towards the centre of the site (871 m/s). An increase in velocity to 1957 m/s towards the edge of the backfilled area and at a depth of approximately 14m correlates well with the higher resistivity zone on Resistivity Profile R2.

Geophysical Section C

This section was located in the south-western part of the site over gently sloping ground.

Initially, 2D Resistivity Imaging Profile R3 was acquired and indicated resistivities in the range of 10 – 70 ohm m, which were interpreted as backfill material. It was therefore decided to acquire an additional Profile (R5) to ensure that the highwall had been crossed. Profile R5 indicated an increase in resistivity (>80 ohm m) away from the backfilled area and has been interpreted as indicating the location of the highwall.

A third 2D Resistivity Imaging Profile (R9) was subsequently acquired with a 4m electrode spacing in order to increase the depth of investigation in this area. The profile was also located as close to the River Deame as possible in order to optimise the length of profile above the highwall. The resistivity profile indicated an increase in resistivity (>80 ohm m) 24.5 m from the western end which was interpreted as the location of the highwall. This position is coincident with the position marked on the abandonment plan.

A four layer model was constructed from Seismic Refraction Profiles S1 and S8 which indicated a gradual increase in P-wave velocity similar to Profile S3 of Geophysical Section A, and has been

interpreted as compacted fill. A refracting horizon with a velocity of 1592 m/s was observed close to the interpreted base of the former open pit. This horizon has been interpreted as stiffly compacted fill material or fractured bedrock.

Geophysical Section D

This section was located in the north-eastern part of the site and crossed the bund.

2D Resistivity Profile R4 indicated resistivities in the range of 10 – 60 ohm m over the bund and towards the central part of the site over the backfilled area. An increase in resistivities (> 80 ohm m) away from the backfilled area was interpreted as the location of the highwall.

Seismic refraction profile S4 indicated a two layer model with a thin (1 - 2m) layer with a velocity of 244 m/s indicative of soil or loose fill, over a layer of velocity 1093 m/s which has been interpreted as homogeneous backfilled material.

Geophysical Section E

This section was located in the north-eastern part of the site and crossed the bund between and parallel to Geophysical Sections A and D, closer to Geophysical Section A.

2D Resistivity Profile R6 indicated resistivities in the range of 10 – 60 ohm m from beneath the bund and towards the central part of the site over the backfilled area which has been interpreted as the backfill material. Towards the edge of the site (to the NW), the resistivities increase slightly, but do not reach 80 ohm m until about 6m from the end of the profile where the depth of investigation is minimal. However, the character of the profile is similar to Geophysical Section F (see below) where the high wall has been fairly confidently interpreted, and thus the character of Section F was used to refine the interpretation of the highwall on Section E. An increase in resistivities (>80 ohm m) at depth of between 6 – 14m beneath the central area of the resistivity profile has been interpreted as evidence of a ridge of bedrock running along the openpit floor.

Seismic refraction profile S5 indicated a three layer model with a thin (2 - 3m) layer with a velocity of 556 m/s indicative of soil or loose fill, over a layer of velocity 862 m/s interpreted as more compact fill material showing a similar increase in compaction of the fill as seen in Sections A and C. A third layer of P-wave velocity 1596 m/s correlating with the 70 ohm m resistivity contour, and giving further credence to an interpretation of a ridge of bedrock running along the former openpit floor.

Geophysical Section F

This section was located in the north-eastern part of the site and crossed the bund between and parallel to Geophysical Sections A and D, closer to Geophysical Section D.

2D Resistivity Profile R7 indicated resistivities in the range of 10 – 60 ohm m over the bund and towards the central part of the site over the backfilled area. An increase in resistivities (> 80 ohm m) away from the backfilled area was interpreted as the location of the highwall. At depth to the NW of the profile a localised increase in resistivities (> 80 ohm m) has been tentatively interpreted as an indication of a bench.

Seismic refraction profile S6 indicated a three layer model with a thin (1 - 3m) layer with a velocity of 613 m/s indicative of soil or loose fill, over successive layers of 746 m/s and 871 m/s interpreted as homogeneous backfilled material with compaction increasing with depth.

Geophysical Section G

This section was located in the western part of the site between Geophysical Sections A and D, parallel to Geophysical Section A.

2D Resistivity Profile R8 is similar in character to the neighbouring Profile R2, and again indicated resistivities in the range of 10 – 60 ohm m over the bund and towards the central part of the site over the backfilled area. An increase in resistivities (> 80 ohm m) away from the backfilled area was confidently interpreted as the location of the highwall, but the absence of an increase in resistivity along the base of the profile suggests that the original openpit floor may be deeper in this area.

Seismic refraction profile S7 indicated a three layer model with a thin (1m) layer with a velocity of 542 m/s indicative of soil or loose fill, over successive layers of 782 m/s and 922 m/s interpreted as homogeneous backfilled material with compaction increasing with depth.

Geophysical Section H

This section was located in the south-western part of the site parallel to and some 60m from Geophysical Section C.

The 2D resistivity imaging profile (R10) exhibits an obvious zone of higher resistivities (>80 ohm m) 38 m from the western end which was interpreted as the location of the highwall. This position is approximately 5m further away from the River Deame than the position marked on the abandonment plan. A refracting horizon of 1965 m/s has been interpreted as indicating the base of the landfill.

Geophysical Section J

This section was located in the western part of the site parallel to and some 36m from Geophysical Section B.

The 2D resistivity imaging profile (R11) is similar in character to profile R10 of Geophysical Section H, with an obvious zone of higher resistivities (>80 ohm m) 58.5 m from the western end which was interpreted as the location of the highwall. This position is approximately 3m further away from the River Deame than the position marked on the abandonment plan. A refracting horizon of 1948 m/s has been interpreted as indicating the base of the landfill.

Geophysical Section K

This section was located in the northern part of the site sub-parallel to and approximately 45 m from Geophysical Section D.

The 2D resistivity imaging profile (R12) is similar in character to the profiles on the southern boundaries of the site, with an obvious zone of higher resistivities (>80 ohm m) 59 m from the northern end and is coincident with the position marked on the abandonment plan. A second zone of higher resistivities (>80 ohm m) is also apparent approximately 13 m further along the profile, and extending for 18 m. This zone has resistivities similar to those interpreted as in-situ Coal Measures, but has a P-wave velocity of 586 m/s, which is consistent with loose fill material. The feature is therefore interpreted as a zone of higher resistivity fill material, possibly backfilled sandstone. A refracting horizon of 1837 m/s has been interpreted as indicating the base of the landfill.

3.0 SUMMARY & RECOMMENDATIONS

- A programme of 11 seismic refraction profiles and 12 2D resistivity imaging profiles was acquired at the site at ten locations (10 Geophysical Sections).
- Geophysical Section B (Resistivity Profile R2 and Seismic Refraction Profile S2) from Phase I of the investigation displayed a clear indication of the location of the in-situ coal measures material, and was thus used as a bench-mark for the interpretation of all the geophysical data from the site.
- Geophysical Section G (Resistivity Profile R8 and Seismic Refraction Profile S7) was similar in character to Geophysical Section B giving further support to the use of Section B as the correlating section for the site dataset.
- After discussion of the results of Phases I and II of the investigation, and further analysis of old mining records, it became apparent that the abandonment plans may be incomplete, and that an old railway cutting may be buried beneath the backfilled material. A third phase of geophysical investigation with a follow-up invasive investigation programme was commissioned.
- The resistivity profiles from Phase III showed clear indications of the highwall location in the southern and south-western parts of the site.
- The location of the highwall has been interpreted from the geophysical data with a reasonable degree of certainty. In the case of Geophysical Sections B, C, G, H and J, the certainty is high. Clear indications of the highwall are also evident in Geophysical Sections A, D, & F, but the highwall within Sections A, C, & G does not appear to be vertical.
- Geophysical Section K displayed a clear indication of the highwall which was coincident with the abandonment plan location. However, a secondary zone of higher resistivity material was observed which has been interpreted as resistive fill material due to its low seismic P-wave velocity.
- The least confident interpretation of the highwall location is seen on Section E, although the similar character of the adjacent Section F was used to aid the interpretation of resistivity profile.
- Indications of benching within the openpit were seen on Sections C & F, and a possible ridge of bedrock was seen on Section E.
- A programme of invasive investigations is to be carried out to confirm and consolidate the geophysical results.



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- LEGEND:
- S1 Seismic refraction profile with start location
 - R1 2D resistivity profile with start location
 - Interpreted location of highwall

Houghton Main Business Park			
Site 1: Survey Locations & Interpretation (Part 1)			
DATE:	April 2008		
CLIENT:	White Young Green Environmental Ltd.		
SCALE:	1:1000 @A3		
Number	Date	Drawn by	Checked
1	21 / 02 / 2008	DC	DC
2	07 / 04 / 2008	DC	DC
3	30 / 04 / 2008	DC	DC



Railway

PARK SPRING ROAD



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 E: info@apexgeoservices.co.uk
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LEGEND:
 0m S1 Seismic refraction profile with start location
 0m R1 2D resistivity profile with start location
 Interpreted location of Highwall

Houghton Main Business Park

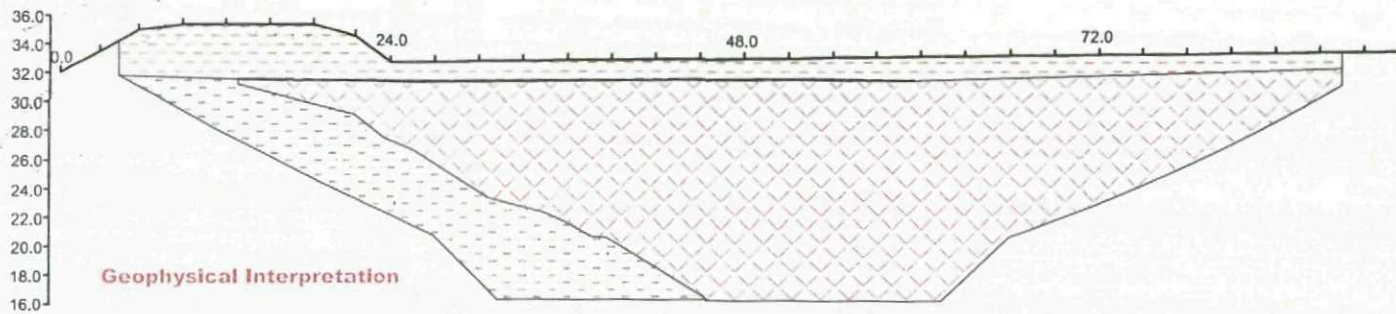
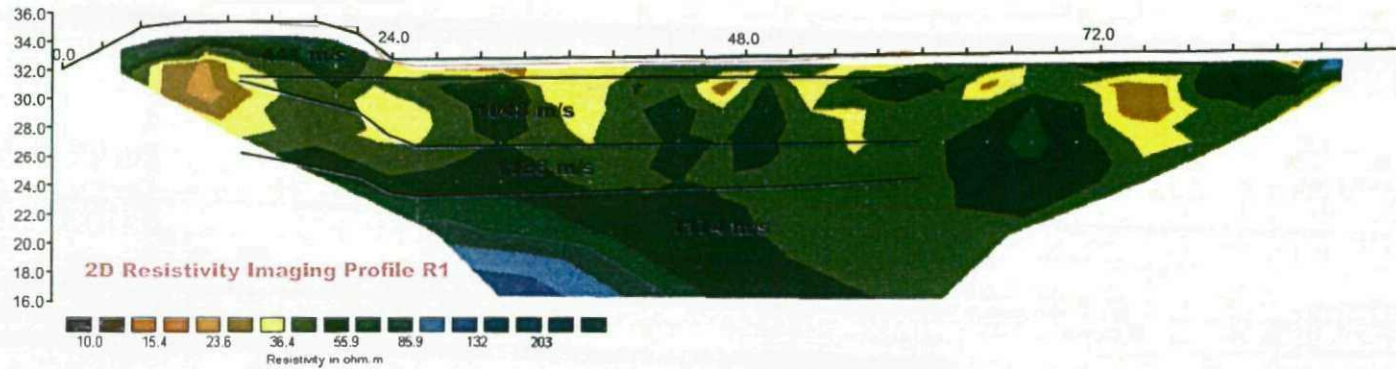
DATE:	April 2008		
CUSTOMER:	White Young Green Environmental Ltd.		
SCALE:	1:1000 @A3		
Issue No.	Issue Date	Initials	Checked
1	21 / 02 / 2008	DC	
2	07 / 04 / 2008	DC	
3	30 / 04 / 2008	DC	

NW




Geophysical Section A

SE

Seismic Refraction Profile S3



LEGEND:

-  Soil/loose fill
-  In-situ coal measures
-  Backfilled open pit



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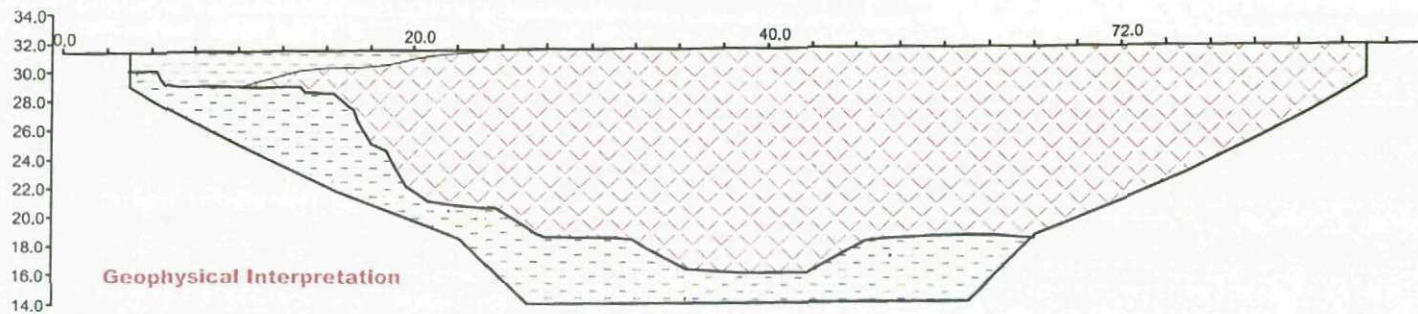
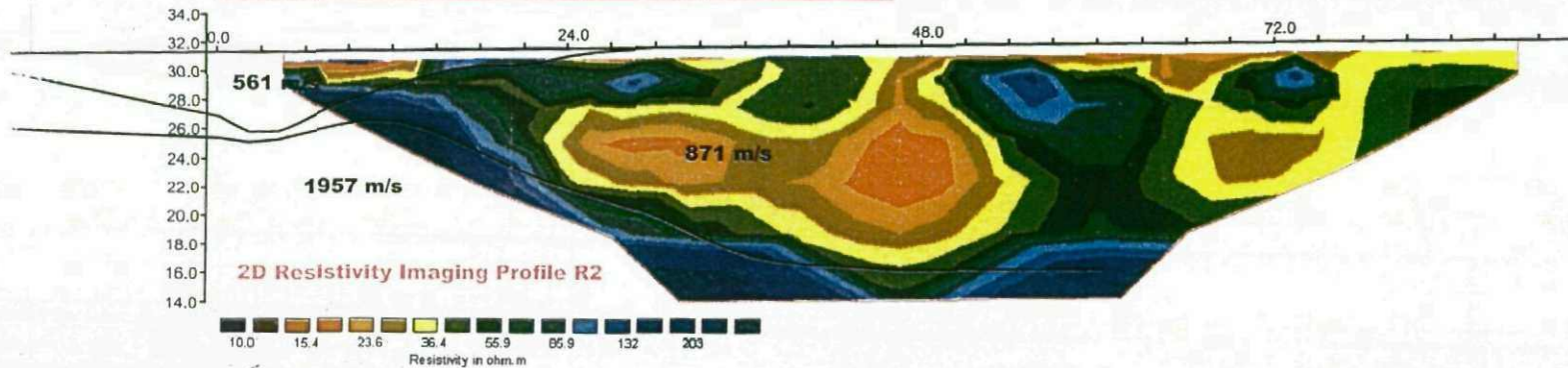
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DRAWING No.:	Geophysical Section A		
DATE:	February 2008		
CLIENT:	White Young Green Environmental Ltd.		
SCALE:	1:500 @A4		
Version:	Date:	Drawn By:	Checked:
No.		Initials	Initials
1	21/02/2008	DC	

W




Geophysical Section B

E

Seismic Refraction Profile S2



LEGEND:

-  Soil/loose fill
-  In-situ coal measures
-  Backfilled open pit



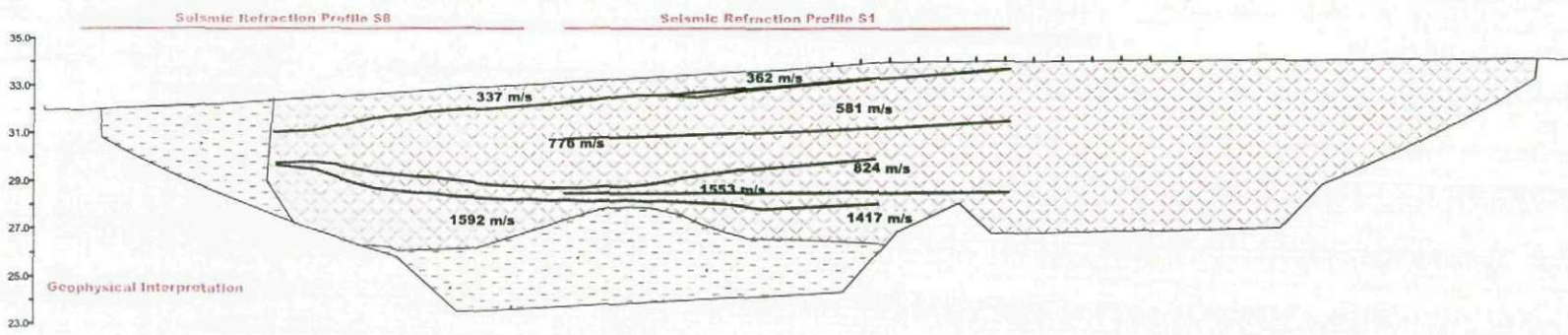
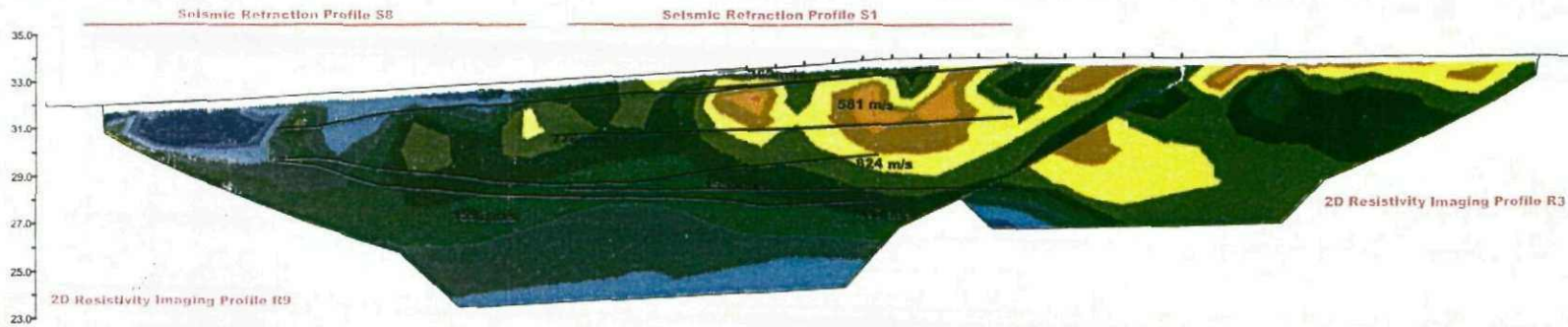
Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourne, Derby, DE73 8DY
 Tel. +44-(0)844 8700 692
 E: info@apexgeoservices.co.uk
 www.apexgeoservices.co.uk

PROJECT:		Houghton Main Business Park	
DRAWING No.:		Geophysical Section B	
DATE:		February 2008	
CLIENT:		White Young Green Environmental Ltd.	
SCALE:		1:500 @A4	
Version:	Date:	Drawn By:	Checked:
1	21/02/2008	DC	

SW

Geophysical Section C

NE



INDEX MAP:



LEGEND:

- Soil/loose fill
- In-situ coal measures
- Backfilled open pit



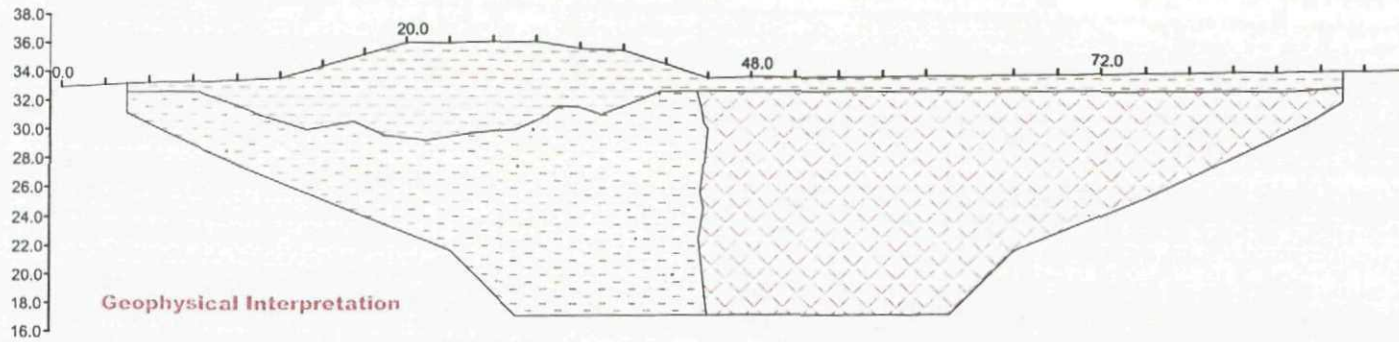
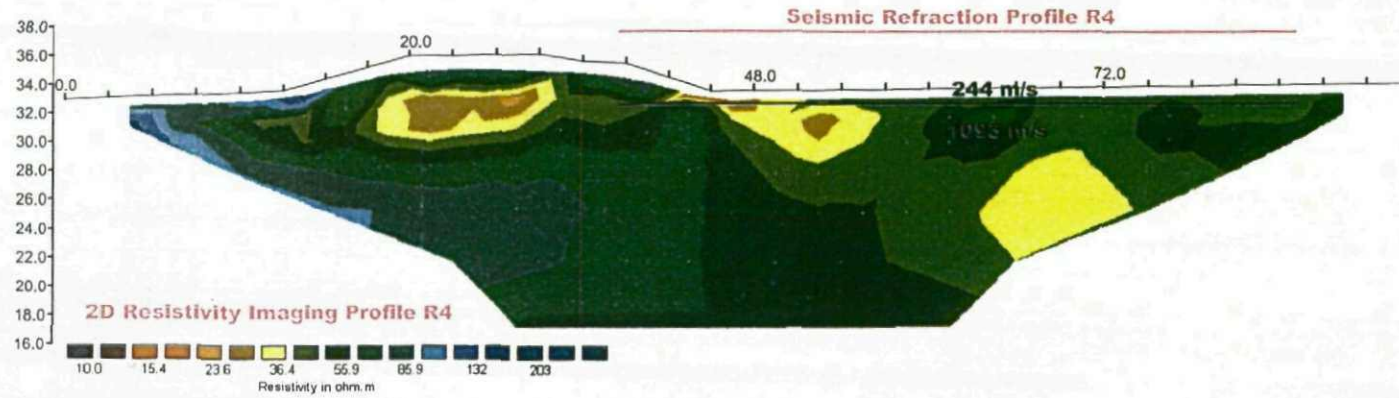
Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourne, Derby, DE73 8DY
 Tel: +44-(0)844 9700 692
 E: info@apexgeoservices.co.uk
 www.apexgeoservices.co.uk

PROJECT:		Houghton Main Business Park	
DRAWING No.:		Geophysical Section C	
DATE:		February 2008	
CLIENT:		White Young Green Environmental Ltd.	
SCALE:		1:750 @A4	
Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	21/02/2008	DC	
2	30/04/2008	DC	




NW

Geophysical Section D

SE



LEGEND:

-  Soil/loose fill
-  In-situ coal measures
-  Backfilled open pit



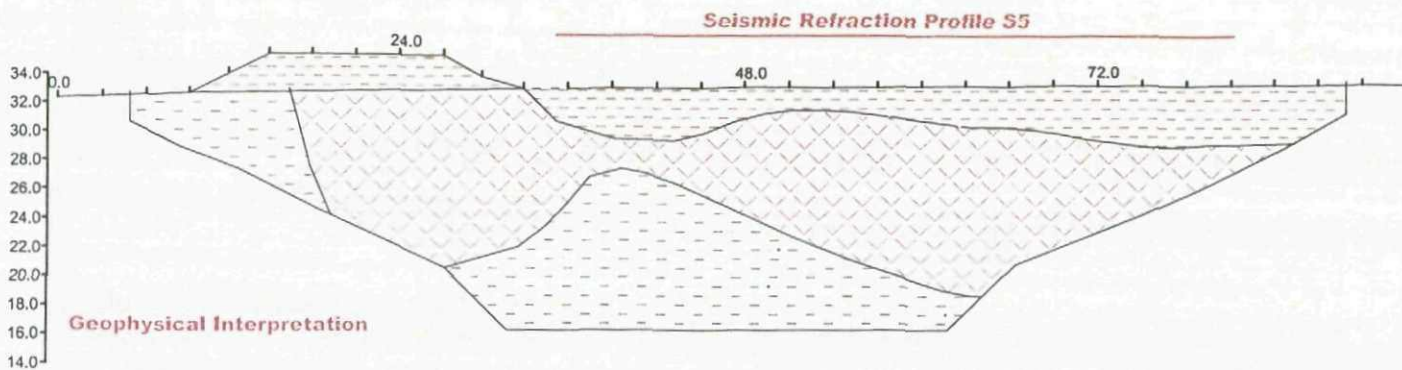
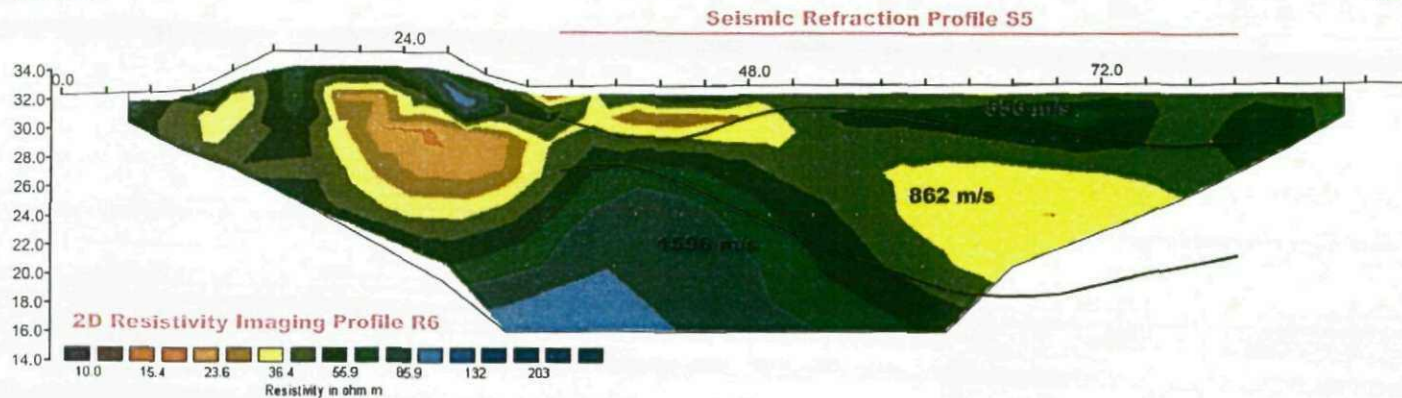
Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourne, Derby, DE73 8DY
 Tel. +44-(0)1844 3700 692
 E: info@apexgeoservices.co.uk
 www.apexgeoservices.co.uk

PROJECT:		Houghton Main Business Park	
DRAWING No.:		Geophysical Section D	
DATE:		February 2008	
CLIENT:		White Young Green Environmental Ltd.	
SCALE:		1:500 @A4	
Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	21/02/2008	DC	

NW

Geophysical Section E




SE



INDEX MAP:



LEGEND:

-  Soil/loose fill
-  In-situ coal measures
-  Backfilled open pit



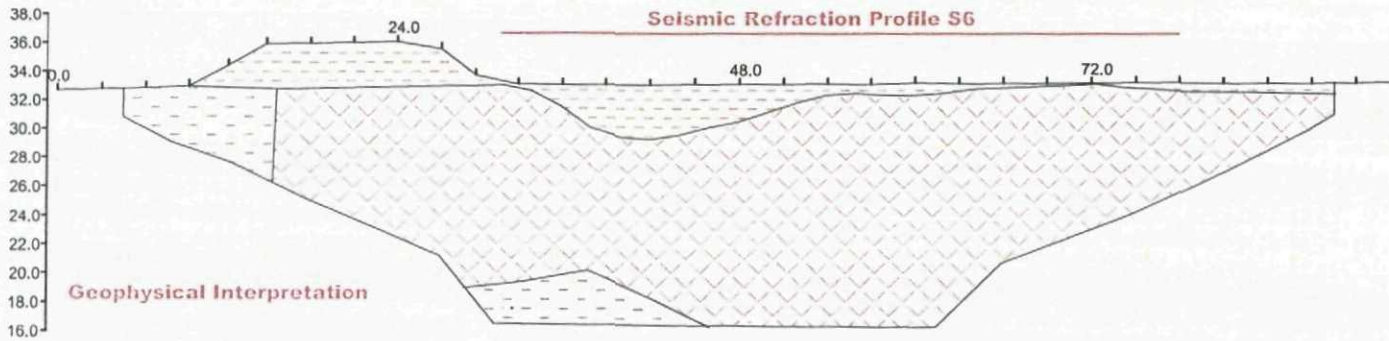
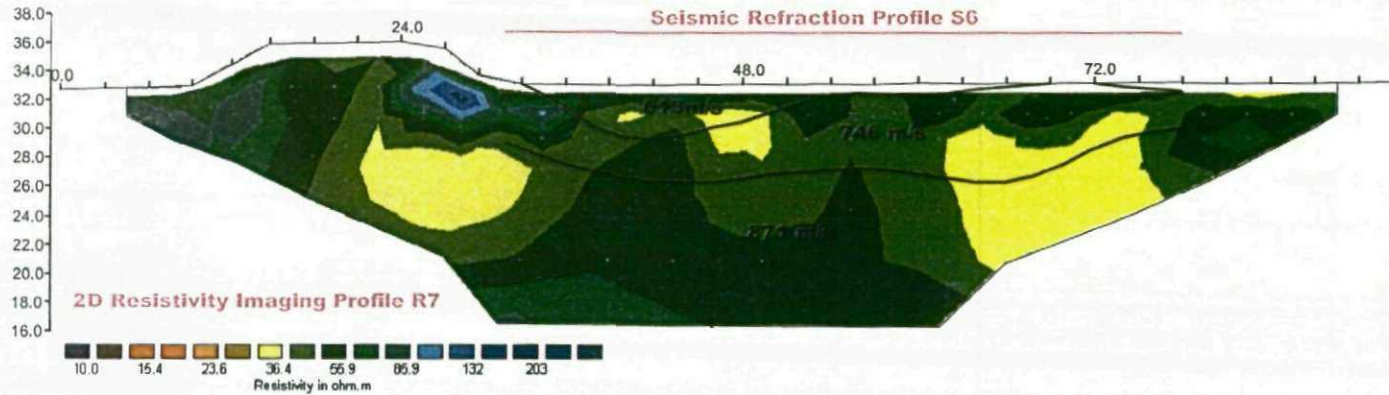
Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourne, Derby, DE73 8DY
 Tel: +44-(0)544 8700 692
 E: info@apexgeoservices.co.uk
 www.apexgeoservices.co.uk

PROJECT:		Houghton Main Business Park	
DRAWING No.:		Geophysical Section E	
DATE:		April 2008	
CLIENT:		White Young Green Environmental Ltd.	
SCALE:		1:500 @A4	
Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	04/04/2008	DC	

NW

Geophysical Section F




SE



INDEX MAP:



LEGEND:

-  Soil/loose fill
-  In-situ coal measures
-  Backfilled open pit



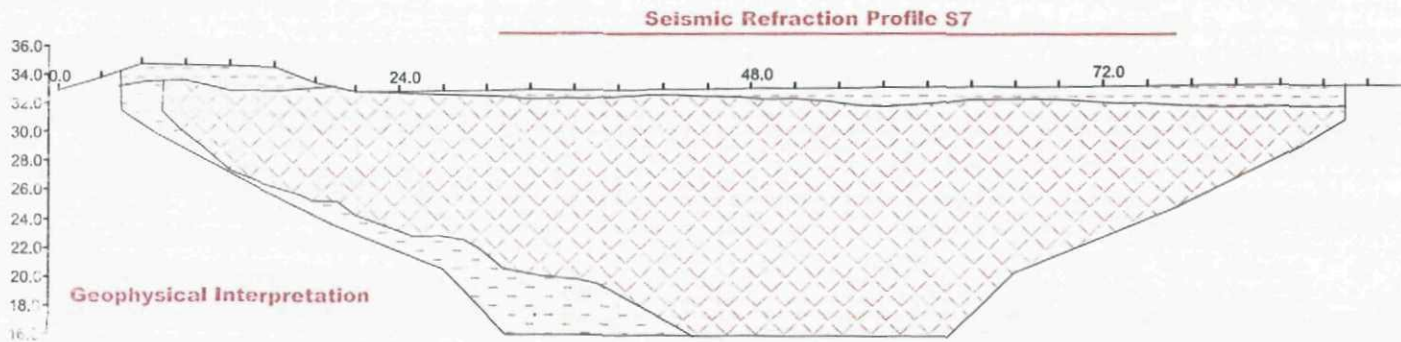
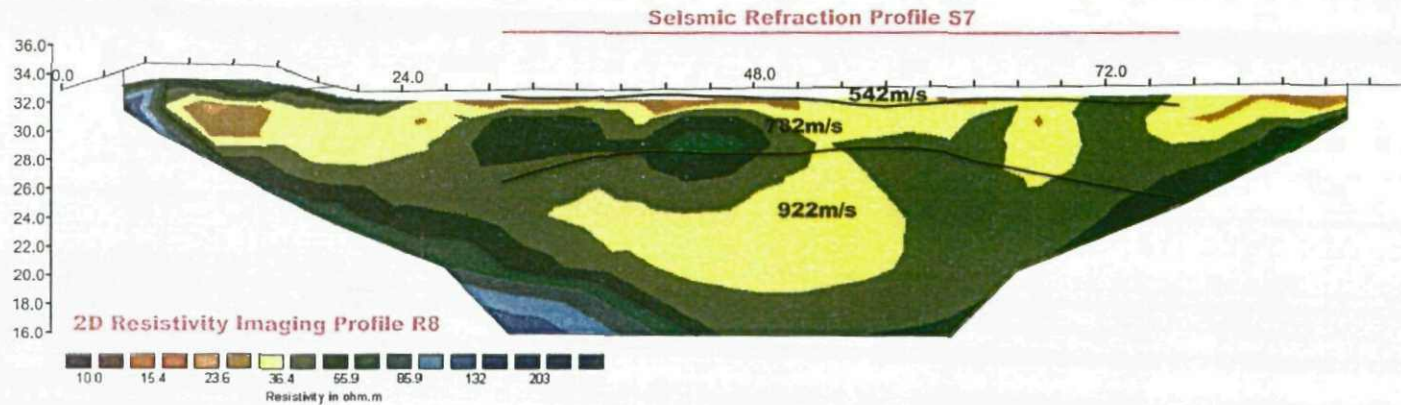
Unit 2, TLF Units, Castle Lane Ind. Est.
 Milbourne, Derby, DE73 8DY
 Tel. +44-(0)1334 3700 692
 E: info@apexgeoservices.co.uk
 www.apexgeoservices.co.uk

PROJECT:		Houghton Main Business Park	
DRAWING NO.:		Geophysical Section F	
DATE:		April 2008	
CLIENT:		White Young Green Environmental Ltd.	
SCALE:		1:500 @A4	
Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	04/04/2008	DC	

NW

Geophysical Section G




SE



INDEX MAP:



LEGEND:

-  Soil/loose fill
-  In-situ coal measures
-  Backfilled open pit



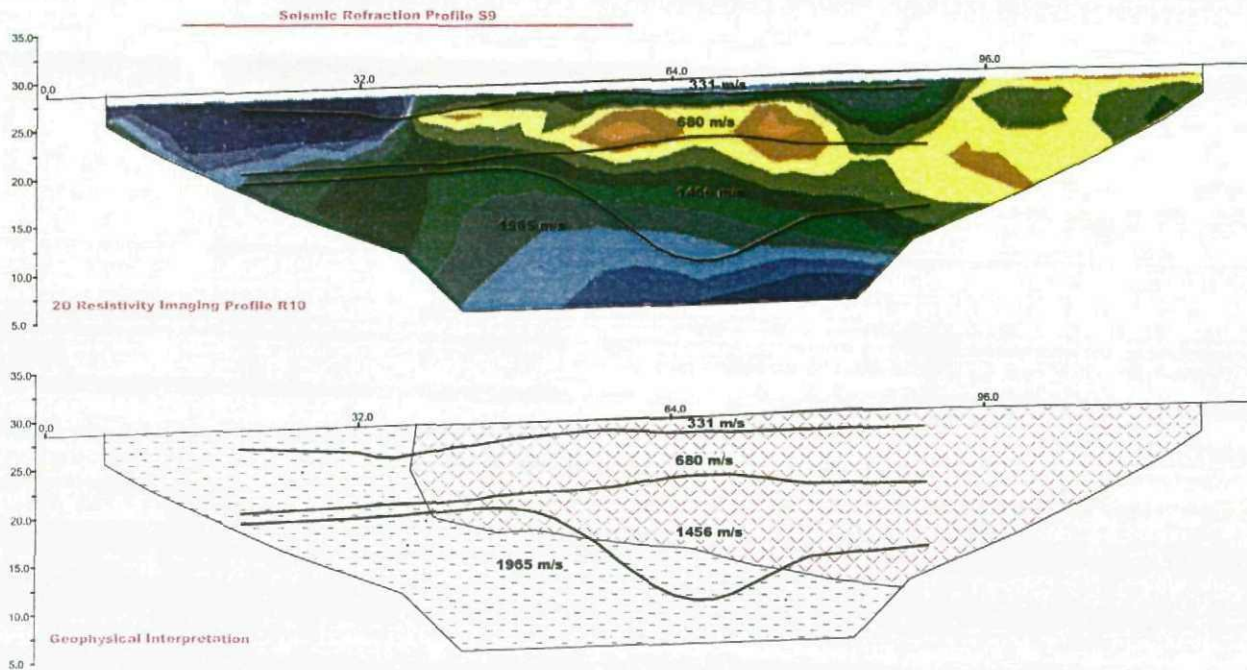
Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourne, Derby, DE73 8DY
 Tel. +44-(0)844 3700 632
 E: info@apexgeoservices.co.uk
 www.apexgeoservices.co.uk

PROJECT:	Houghton Main Business Park		
DRAWING No.:	Geophysical Section G		
DATE:	April 2008		
CLIENT:	White Young Green Environmental Ltd.		
SCALE:	1:500 @A4		
Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	04/04/2008	DC	

SW

Geophysical Section H




NE



INDEX MAP:



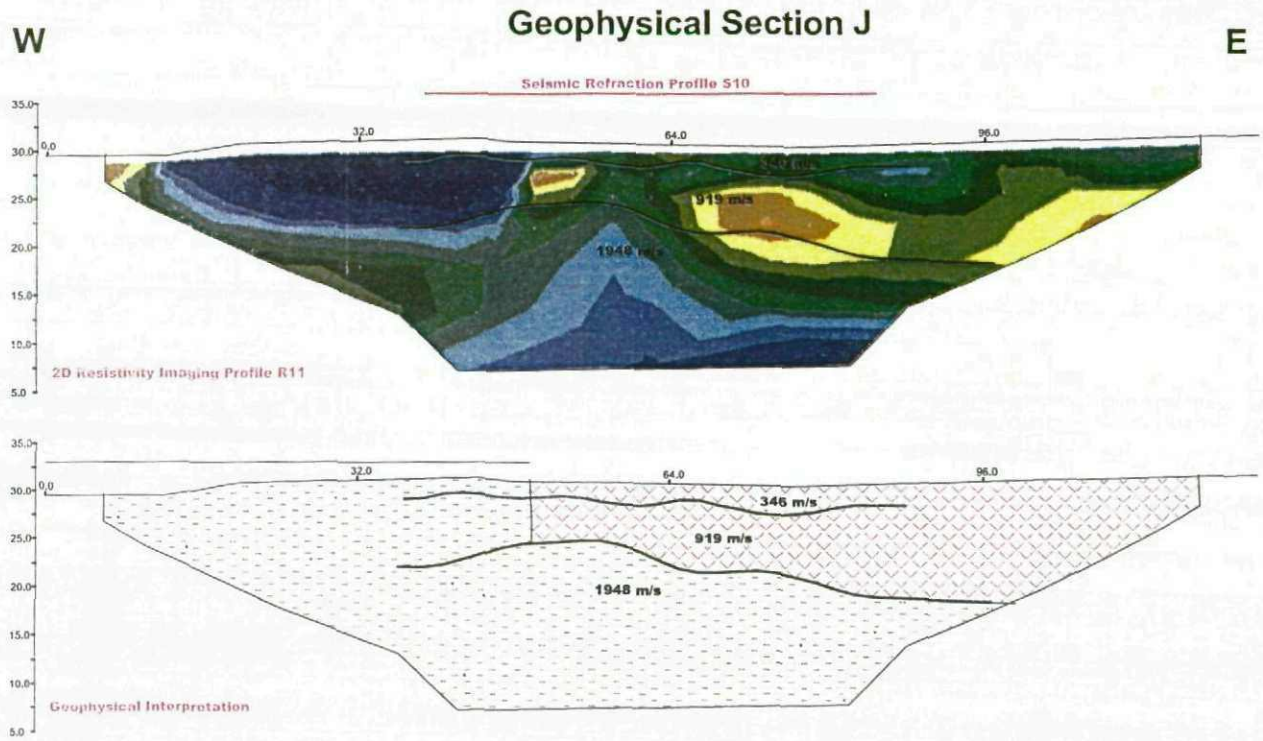
LEGEND:

-  Soil/loose fill
-  In-situ coal measures
-  Backfilled open pit



Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourn, Derby, DE73 8DY
 Tel: +44-(0)1433 700 032
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PROJECT:		Houghton Main Business Park	
DRAWING No.:		Geophysical Section H	
DATE:		April 2008	
CLIENT:		White Young Green Environmental Ltd.	
SCALE:		1:750 @A4	
Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	30/04/2008	DC	



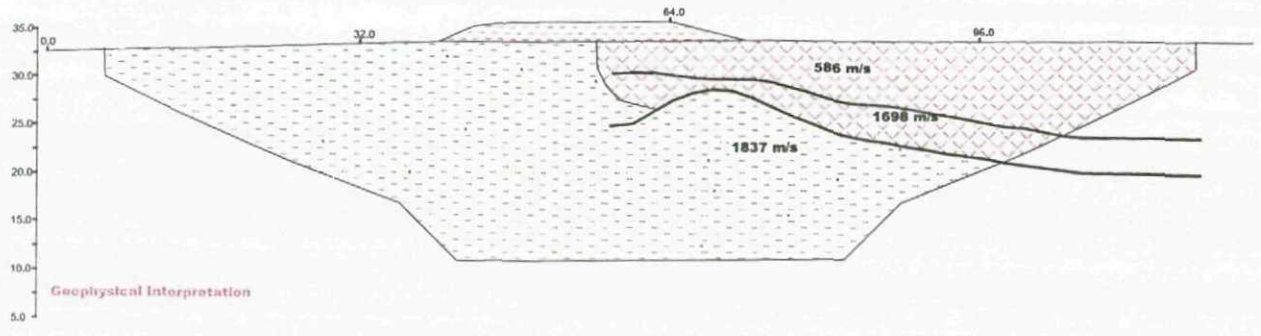
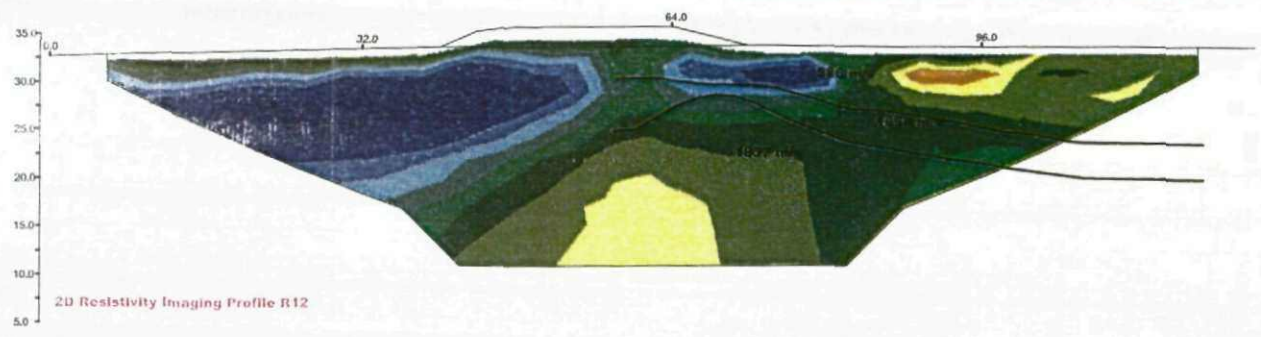
- LEGEND:**
- Soil/loose fill
 - In-situ coal measures
 - Backfilled open pit



Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourne, Derby, DE73 8DY
 Tel: +44-(0)1334 3700 532
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 www.apexgeoservices.co.uk

PROJECT:		Houghton Main Business Park	
DRAWING No.:		Geophysical Section J	
DATE:		April 2008	
CLIENT:		White Young Green Environmental Ltd.	
SCALE:		1:500 @A4	
Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	30/04/2008	DC	

Geophysical Section K
Seismic Refraction Profile S11



LEGEND:

- Soil/loose fill
- In-situ coal measures
- Backfilled open pit



Unit 2, TLF Units, Castle Lane Ind. Est.
 Melbourne, Derby, DE73 8DY
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 www.apexgeoservices.co.uk

PROJECT:	Houghton Main Business Park		
DRAWING NO.:	Geophysical Section K		
DATE:	April 2008		
CLIENT:	White Young Green Environmental Ltd.		
SCALE:	1:500 @A4		

Version	Date	Drawn By:	Checked:
No.	Initials	Initials	Initials
1	30/04/2008	DC	

APPENDIX I GEOPHYSICAL METHODOLOGY

- M1. Methods Used**
- 1.1 Seismic Refraction Profiling
 - 1.2 2D Resistivity Imaging

- M2. Equipment Used**
- 2.1 Seismic Refraction Profiling
 - 2.2 2D Resistivity Imaging

- M3. Field Procedure**
- 3.1 Seismic Refraction Profiling
 - 3.2 2D Resistivity Imaging

- M4. Data Processing**
- 4.1 Seismic Refraction Profiling
 - 4.2 2D Resistivity Imaging

M1. Methods Used

1.1 Seismic Refraction Profiling

This method measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities. Readings are taken using geophones connected via multi-core cable to a seismograph.

1.2 2D Resistivity Imaging

This surveying technique makes use of the Wenner resistivity array. The 2D-resistivity profiling method records a large number of resistivity readings in order to map lateral and vertical changes in material types. The 2D-resistivity profiling method involves the use of up to 64 electrodes connected to a resistivity meter, using computer software to control the process of data collection and storage.

M2. Equipment Used

2.1 Seismic Refraction Profiling

The equipment used was a Geometrics Geode seismograph, a 24 geophone array, and sledgehammer and plate source.

2.2 2D-Resistivity Profiling

The equipment used was a Campus Tigre resistivity meter, imaging software, a 32 takeout multicore cable and 32 stainless steel electrodes. The recorded data was processed and viewed immediately after the survey.

M3. Field Procedure

3.1 Seismic Refraction Profiling

Each seismic spread consisted of 24 collinear geophones. Records from up to seven different positions were taken on each spread (2 x off-end, 2 x end, 3 x within the geophone array) to ensure optimum coverage of all refractors. Ongoing estimation of refractor velocities was carried out to monitor refractor type and depth.

Each of the profiles had the following recording parameters:

Profile	Geophones	Spacing	Length	Azimuth
No.	No.	(m)	(m)	
S1	24	2	46	SW - NE
S2	24	2	46	W - E
S3	24	2	46	NW - SE
S4	24	2	46	NW - SE
S5	24	2	46	NW - SE
S6	24	2	46	NW - SE
S7	24	2	46	NW - SE
S8	24	2	46	SW - NE
S9	24	2	46	SW - NE
S10	24	2	46	W - E
S11	24	2	46	NW - SE

3.2 2D-Resistivity Imaging Profiles

The 2D-Resistivity profiles have the following recording parameters:

Profile	Electrodes	Spacing	Length	Depth of Investigation	Azimuth
No.	No.	(m)	(m)	(m)	
R1	32	3	93	17	NW - SE
R2	32	3	93	17	W - E
R3	32	3	93	17	SW - NE
R4	32	3	93	17	NW - SE
R5	32	3	93	17	SW - NE
R6	32	3	93	17	NW - SE
R7	32	3	93	17	NW - SE
R8	32	3	93	17	NW - SE
R9	32	4	124	25	SW - NE
R10	32	4	124	25	SW - NE
R11	32	4	124	25	W - E
R12	32	4	124	25	NW - SE

M4. Data Processing

4.1 2D Resistivity Imaging

The field readings were stored in computer files and inverted using the RES2DINV package (Campus Geophysical Instruments, 1997) with up to 5 iterations of the measured data carried out for each profile to obtain a 2D-Depth model of the resistivities.

The inverted 2D-Resistivity models and corresponding interpreted geology are displayed as Profile 6. The chainage is indicated along the horizontal axis of the profile and the elevation in m is indicated on the vertical axis. All profiles have been contoured using the same contour intervals and colour codes.

It is important to note that the data displayed on the 2D-Resistivity profiles is real physical data however interpretation of the geophysical results is required to transform the resistivities directly into geological layers.

4.2 Seismic Refraction Profiling

First break picking in digital format was carried out using PICKWIN for input into PLOTREFA software.. The thickness estimates were plotted at the relevant locations on the Geophysical Sections.

**APPENDIX I:
GAS AND GROUNDWATER MONITORING DATA**

WHITE YOUNG GREEN ENVIRONMENTAL

Newstead Court, Little Oak Drive,
 Sherwood Business Park, Annesley,
 Nottingham, NG15 0DR



GROUNDWATER / GAS MONITORING RECORD SHEET

Client: William Saunders Partnership LLP **Job No.:** A042741 **Instruments Used:** Infra Red gas analyser and Dip Meter
Project: Grimethorpe **Date:** 07.03.08 **Monitored By:**

Installation No.	Elevation of cover (mAOD)	Peak ¹		Steady ²			Flow Rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (m bgl)	Base Depth (m bgl)	Water Level (mAOD)	Remarks
		CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)						
CP01	31.77	0.0	0.1	0.0	0.1	20.4	0.0	1008	4.88		26.89	
CP02	33.49	0.0	0.0	0.0	0.0	20.6	0.0	1008	5.79		27.70	
CP03	33.29	-	-	-	-	-	-	-	-		-	No gas reading due to surface water which drained when bung pulled
CP04	33.56	0.0	0.0	0.0	0.1	20.5	0.0	1008	6.37		27.19	
CP05	33.72	0.0	0.0	0.0	0.0	20.6	0.0	1007	5.50		28.22	

Background Gas Levels:

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.0	0.0	20.5	1009
After Monitoring	0.0	0.0	20.6	1008

- 1 The peak reading is the maximum recorded level during a monitoring event.
- 2 The steady reading is the level which remained constant after approximately 1 minute.

WHITE YOUNG GREEN ENVIRONMENTAL

Newstead Court, Little Oak Drive,
Sherwood Business Park, Arnesley,
Nottingham, NG15 0DR



GROUNDWATER / GAS MONITORING RECORD SHEET

Client: William Saunders Partnership LLP		Job No.: A042741		Instruments Used: Infra Red gas analyser and Dip Meter								
Project: Gnmethorpe		Date: 12.03.2006		Monitored By: Chris Amott								
Weather: Very Windy, Dry and bright												
Installation No.	Elevation of cover (mAOD)	Peak ¹		Steady ²			Flow Rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (m bgl)	Base Depth (m bgl)	Water Level (mAOD)	Remarks
		CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)						
CP01	31.77	-	-	-	-	-	-	-	-	-	-	Hole vandalised, tap removed and bung forced down into standpipe
CP02	33.49	0.0	0.0	0.0	0.0	20.6	0.0	994	5.84	-	27.65	
CP03	33.29	-	-	-	-	-	-	-	-	-	-	Hole completely submerged in large pool of surface water, borehole draining pond when bung pulled
CP04	33.56	0.0	0.1	0.0	0.1	20.8	0.0	994	6.40	-	27.16	
CP05	33.72	0.0	0.0	0.0	0.0	20.9	0.0	993	5.53	-	28.19	

Background Gas Levels:

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.0	0.1	20.9	994
After Monitoring	0.0	0.0	20.6	995

¹ The peak reading is the maximum recorded level during a monitoring event.

² The steady reading is the level which remained constant after approximately 1 minute

WHITE YOUNG GREEN ENVIRONMENTAL

Newstead Court, Little Oak Drive,
 Sherwood Business Park, Annesley,
 Nottingham, NG15 0DR



GROUNDWATER / GAS MONITORING RECORD SHEET

Client: William Saunders Partnership LLP		Job No.: A042741		Instruments Used: Infra Red gas analyser and Dip Meter								
Project: Grimethorpe		Date: 17.03.08		Monitored By: Chris Arnott								
Weather: sunny and windy												
Installation No.	Elevation of cover (mAOD)	Peak ¹		Steady ²			Flow Rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (m bgl)	Base Depth (m bgl)	Water Level (mAOD)	Remarks
		CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)						
CP01	31.77	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			Hole vandalised, tap removed and bung forced down into standpipe
CP02	33.49	0.0	0.2	0.0	0.2	20.7	0.0	1023	6.85		26.6	
CP03	33.29	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.88		28.4	Some surface water still draining into borehole
CP04	33.56	0.0	0.1	0.0	0.1	20.8	0.0	1023	6.38		27.2	
CP05	33.72	0.0	0.2	0.0	0.2	20.5	0.0	1022	5.49		28.2	

Background Gas Levels:

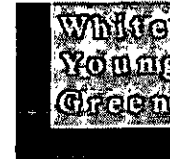
	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.0	0.1	20.8	1024
After Monitoring	0.0	0.1	20.7	1022

1 The peak reading is the maximum recorded level during a monitoring event.

2 The steady reading is the level which remained constant after approximately 1 minute.

WHITE YOUNG GREEN ENVIRONMENTAL

Newstead Court, Little Oak Drive,
 Sherwood Business Park, Annesley,
 Nottingham, NG15 0DR



GROUNDWATER / GAS MONITORING RECORD SHEET

Client: William Saunders Partnership LLP	Job No.: A042741	Instruments Used: Infra Red gas analyser and Dip Meter
Project: Grimethorpe	Date: 09.05.08	Monitored By: AN
Weather: sunny and dry		

Installation No.	Elevation of cover (mAOD)	Peak ¹		Steady ²			Flow Rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (m bgl)	Base Depth (m bgl)	Water Level (mAOD)	Remarks
		CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)						
CP01	31.77	0.0	10.8	0.0	10.8	7.7	0.4	1012	2.97		28.80	
CP02	33.49	0.0	4.4	0.0	4.4	7.1	0.2	1012	7.13		26.36	
CP03	33.29	0.1	8.5	0.0	8.5	5.6	0.1	1011	5.83		27.46	
CP04	33.56	0.0	3.5	0.0	3.5	12.5	0.1	1012	7.16		26.40	
CP05	33.72	0.0	7.9	0.0	7.9	8.3	0.7	1011	5.65		28.07	

Background Gas Levels:

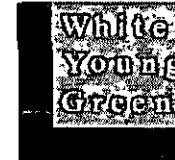
	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.0	0.0	20.6	1012
After Monitoring	0.0	0.0	20.4	1011

1 The peak reading is the maximum recorded level during a monitoring event.

2 The steady reading is the level which remained constant after approximately 1 minute.

WHITE YOUNG GREEN ENVIRONMENTAL

Newstead Court, Little Oak Drive,
 Sherwood Business Park, Annesley,
 Nottingham, NG15 0DR



GROUNDWATER / GAS MONITORING RECORD SHEET

Client: William Saunders Partnership LLP	Job No.: A042741	Instruments Used: Infra Red gas analyser and Dip Meter
Project: Grimethorpe	Date: 21.05.08	Monitored By: AN
Weather: sunny and dry; windy		

Installation No.	Elevation of cover (mAOD)	Peak ¹		Steady ²			Flow Rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (m bgl)	Base Depth (m bgl)	Water Level (mAOD)	Remarks
		CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)						
CP01	31.77	0.0	4.3	0.0	4.3	12.3	0.4	1012	3.00		28.77	
CP02	33.49	0.0	0.6	0.0	0.6	13.2	0.6	1011	7.07		26.42	
CP03	33.29	0.0	3.3	0.0	3.3	12.1	0.1	1012	5.97		27.32	
CP04	33.56	0.0	1.0	0.0	1.0	14.9	0.1	1011	7.26		26.30	
CP05	33.72	0.0	5.9	0.0	5.9	11.3	0.0	1011	5.83		27.89	

Background Gas Levels:

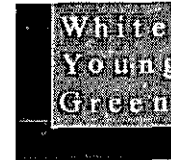
	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.0	0.0	20.9	1012
After Monitoring	0.0	0.0	20.9	1011

1 The peak reading is the maximum recorded level during a monitoring event.

2 The steady reading is the level which remained constant after approximately 1 minute.

WHITE YOUNG GREEN ENVIRONMENTAL

Newstead Court, Little Oak Drive,
 Sherwood Business Park, Annesley,
 Nottingham, NG15 0DR



GROUNDWATER / GAS MONITORING RECORD SHEET

Client: William Saunders Partnership LLP	Job No.: A042741	Instruments Used: Infra Red gas analyser and Dip Meter
Project: Grimethorpe	Date: 03.06.08	Monitored By: AN
Weather: Rainy and overcast		

Installation No.	Elevation of cover (mAOD)	Peak ¹		Steady ²			Flow Rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (m bgl)	Base Depth (m bgl)	Water Level (mAOD)	Remarks
		CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)						
		CP01	31.77	0.0	4.3	0.0						
CP02	33.49	0.0	0.7	0.0	0.7	15.7	0.9	1007	5.80		27.69	
CP03	33.29	0.0	0.7	0.0	0.7	6.0	8.2	1007	3.59		29.70	
CP04	33.56	0.0	0.5	0.0	0.5	8.5	0.3	1007	7.33		26.23	
CP05	33.72	0.0	5.9	0.0	5.9	12.5	0.1	1006	4.21		29.51	

Background Gas Levels:

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.0	0.0	20.9	1007
After Monitoring	0.0	0.0	20.9	1007

1 The peak reading is the maximum recorded level during a monitoring event.

2 The steady reading is the level which remained constant after approximately 1 minute.