LITHOS



Preliminary Geoenvironmental Investigation

Land at Halifax Road, Thurgoland

For Mr J Elmhirst

Report no: 2928/1

Date: December 2017

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APPENDICES

Appendix A – General notes

01	Environmental setting

Appendix B – Drawings

Drawing	Title
2928/1	Site location plan
2928/2	Not produced
2928/3	Site features
2928/4	Site photos
2928/5	Preliminary conceptual site model

Appendix C - Commission

Appendix D – Historical OS plans*

Appendix E – Search responses*

From	Date	Content
Landmark	21st November 2017	Envirocheck report
Coal Authority	21st November 2017	Mining report

* Some of this data is not included within the paper copy of this report; most is included in the PDF copy and all is included on the CD

FOREWORD (preliminary geoenvironmental investigation report)

This report has been prepared for the sole use and reliance of the Client named on page 1 and cannot be relied upon by any other parties without the express written authorisation of Lithos Consulting Limited (Lithos). Any unauthorized third party relies on this report at their own risk and the authors owe them no duty of care.

The report presents observations and factual data obtained during our site investigation, and provides an assessment of geoenvironmental issues with respect to information provided by the Client regarding the proposed development. Further advice should be sought from Lithos prior to significant revision of the development proposals.

The report should be read in its entirety, including all associated drawings and appendices. Lithos cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context. However, it should be noted that in order to keep the number of sheets of paper in the hard copy to a minimum, some information (e.g. full copy of the Landmark/Groundsure Report) is only included within the "electronic", PDF Report on the accompanying CD.

The findings and opinions conveyed in any Desk Study section of the report (including review of any third party reports) are based on information obtained from the sources listed, which Lithos understands are reliable. All reasonable skill, care and diligence has been applied in examining the information obtained. However, Lithos accept no responsibility for inaccuracies in the data supplied or for opinions based on any such inaccurate data.

Where the report refers to the potential presence of invasive weeds such as Japanese Knotweed, or the presence of asbestos containing materials, it should be noted that the observations are for information only and should be verified by a suitably qualified expert.

Lithos reserve the right to amend their conclusions and recommendations in the light of further information that may become available.

PRELIMINARY GEOENVIRONMENTAL INVESTIGATION OF LAND AT HALIFAX ROAD, THURGOLAND

1 INTRODUCTION

1.1 The commission and brief

1.1.1 Lithos Consulting were commissioned by Mr J Elmhirst to carry out a preliminary investigation of land off Halifax Road.

1.1.2 Correspondence regarding Lithos' appointment, including the brief for this investigation, is included in Appendix C. The agreed scope of works included:

- A site walkover and inspection
- An assessment of the land use history
- Determination of the site's environmental setting
- A mining risk assessment in accordance with Coal Authority guidance.
- Assessment of anticipated ground conditions, including potential contaminants
- Assessment of anticipated foundation and engineering issues associated with redevelopment for a residential end-use
- Provision of recommendations for an appropriate ground investigation

1.1.3 This Preliminary Investigation comprised an inspection of historical and geological maps and information provided by the British Geological Survey, the Landmark Information Group, the Coal Authority and the Environment Agency. In addition a site inspection has been carried out by Lithos.

1.1.4 Primary aims of this investigation were to identify salient geoenvironmental issues affecting the site to enable design and costing of an appropriate intrusive investigation, and to support the submission of a planning application.

1.2 The proposed development

1.2.1 It is understood that consideration is being given to redevelopment of approximately one hectare in the far west of the site (see Drawing 2828/3) with 'traditional' two and three storey domestic dwellings, associated gardens, POS and adoptable roads and sewers. No site layout has been provided at this stage.

1.3 Report format and limitations

1.3.1 Standard definitions, procedures and guidance are contained within Appendix A, which includes background, generic information on assessment of the site's environmental setting.

1.3.2 General notes and limitations relevant to all Lithos preliminary investigations are described in the Foreword and should be read in conjunction with this report. The text of the report draws specific attention to any modification to these procedures and to any other special techniques employed.

2 SITE DESCRIPTION

2.1 General

2.1.1 The site's location is shown on Drawing 2928/1 presented in Appendix B to this report. Site details are summarised in the table below.

Detail	Remarks
Location	7km south west of Barnsley town centre
NGR	SE 291 011
Area	7.0 hectares (17.3 acres)
Known services	Overhead electrical utilities

2.2 Site features

2.2.1 Lithos completed a walkover survey of the site on 22nd November 2017. Existing salient features at the time of the walkover are presented on Drawing 2928/3 in Appendix B to this report.

2.2.2 The site is split into two parcels of land separated by arable farmland and for ease of reference the site has been divided into two areas (Parcels A & B); see Drawing 2928/3.

Parcel A (10,000m²)

2.2.3 The smaller, northern Parcel (A) is accessed via a public footpath off Fir Tree Estate in the west, and comprises a rectangular grassed field used for livestock which slopes gently down to the northeast. A public footpath crosses the north of the site from the western boundary to the northern corner.

2.2.4 Two metal gates are located on the site's boundary; one in the southern corner and another in the east both leading to unmettled farm tracks.

Parcel B (60,000m²)

2.2.5 The southern Parcel (B) is accessed off Smithy Hill in the east via a farm track, and comprises a disused farmyard occupying approximately (c. 3,000m²) in the far northeast with the remaining area comprising 3 fields. The track runs west to east adjacent to the farmyard leading to the surrounding fields.

2.2.6 A number of buildings are present in the farmyard area including a two storey farmhouse with outbuilding and a 'U' shaped two storey building, both of stone construction, located on the eastern boundary. The 'U' shaped building appears to have been used as a milking parlour and storage shed.

2.2.7 A smaller single storey building of brick construction is present in the centre south of the farmyard area which appears to be a garage/storage shed. In the north and centre of the farmyard area are concrete slabs surrounded by largely demolished breezeblock walls.

2.2.8 The east of the farmyard is overgrown with small areas of concrete hardstand.

2.2.9 The largest field within Parcel B occupies approximately 33,000m² and slopes down to the north and northeast and at the time of the walkover appears to have had a crop sown. A smaller field to the south (c. 17,500m²) is used for livestock and slopes down to the south. A small towed bowser is present in the far west of this field. The smallest field (c. 6,500m²), situated in the southwest corner, slopes down to the and is heavily overgrown with no obvious use.

2.2.10 All 3 fields are bounded by a mixture of dry stone walls, post & wire fencing and hedgerows with (semi)mature trees located sporadically on the boundaries.

2.2.11 An electric substation is present in the centre north of the farmyard with overhead cables running southeast to, and along the boundary between the larger two fields.

2.2.12 Existing salient features are summarised in the table below.

Feature	Parcel A	Parcel B
Current access	Via public footpath off Fir Tree Estate	Off Smithy Hill
Topography	Gently slopes down to the north	Slopes of up to 1 in 10
Approximate areas	10,000m^2 grass	530m^2 buildings 470m^2 concrete hardstand 59,000m^2 grass
Nature of boundaries	North, west & east – post & wire fencing with hedgerows South – dry stone wall	North & east – predominantly post & wire fencing with hedgerows South & west – predominantly dry stone walls with hedgerows
Surrounding land uses	North, east & south – open fields West – housing off Fir Tree Estate	North – housing off Fir Tree Estate and open fields. East – open fields South - Halifax Road, with open fields and garage beyond. West – housing off Smithy Hill

2.2.13 A selection of site photographs is included on Drawing 2928/4.

3 SITE HISTORY

3.1 In order to investigate the development history and previous land uses at the site and immediate surrounding land, site centred extracts from Ordnance Survey (OS) plans dating back to 1855 have been examined. These plans are presented in Appendix D to this report.

3.2 The table below provides a summary of the salient points relating to the history of the site with respect to the proposed end use. It is not the intention of this report to describe in detail all the changes that have occurred on or adjacent to the site. Significant former uses/operations are highlighted in **bold** text for ease of reference.

Date	Site (Parcel A)	Site (Parcel B)	Surrounding land
1855	Comprises arable farmland. Footpath runs north to south across.	Comprises farmland divided up into fields. Road/track enters the site from the west.	Predominantly farmland. **Railway** (Thurgoland Coal Branch) Immediately beyond north eastern boundaries. Thurgoland village immediately to the west. 'extraction coal mine' 50m north west. Halifax Road runs adjacent to southernmost boundary.
1894	No significant changes.	No significant changes.	Extraction coal mine no longer shown.
1906		Small **buildings** (likely farm buildings) in the far north west.	No significant changes.
1932		**Institute** of men built in south western corner.	Railway shown as dismantled. Pump immediately beyond southern boundary. Smithy no longer shown. War Memorial shown immediately beyond south western corner of site.
1956		No significant changes.	Development of Thurgoland with housing to the northeast & south.
1960			**Garage** (filling station) immediately south of Halifax Road.
1966		Further **buildings** in far west of the site	No significant changes.
1989		Buildings in west called Thurgoland Farm.	
2000		No significant changes.	
2006			
2017		Institute of men building no longer shown.	

3.3 The Thurgoland Coal Branch railway, which runs north west to south east just to the north west of the site was opened in November 1847 to act as a link between Sheffield-Manchester Railway (to the south) and Stanhope Silkstone Colliery (to the north). The line was dismantled following closure of the Stanhope Colliery in 1875. Only coal fired trains were used on the line and it was never electrified.

3.4 Whilst not shown on historical mapping evidence from the BGS and Landmark shows that land to the north east has been historically worked for coal using opencast methods. See Section 4.2.

4 ENVIRONMENTAL SETTING

4.1 General

4.1.1 Notes describing how the site's environmental setting has been assessed are included in Appendix A to this report. The responses received from the Coal Authority, the BGS and extracts from the Landmark Report are presented in Appendix E.

Issue	Data reviewed	
Geology	1:10,000 BGS map (Sheet SE 20 SE) BGS Log SE20SE/21 BGS memoir no.87	Drift – none mapped – likely veneer of residual soils comprising gravelly clays. Solid – Penistone Flags Sandstone with Lower Coal Measures (interbedded mudstone, siltstone & sandstone) in far south & west. Shallowest coal seam – Un-named thin coal seam at shallow depth. Strata Dip - 4° to the north east. Faults – Fault crosses the south easternmost corner of the site.
Mining	Coal Authority BGS maps	This site is located within a Coal Mining Development Low Risk Area. Further details in Section 4.2 below.
Landfill	Environment Agency Envirocheck report	Disused railway cutting off A629 just beyond the eastern boundary of Parcel B, recorded as accepting inert waste. Further details in Section 4.3 below
Quarrying	Historical OS plans	None known within 250m of sites boundary
Radon	Environment Agency Envirocheck report	The site lies in an area where less than 1% of homes are estimated to be above the action level. Therefore no protective measures required.
Hydrogeology		Source Protection Zone? None beneath the site. Aquifer: None mapped (Drift); Secondary A Aquifer (Solid). Groundwater abstractions? None of significance to site. Soil leaching potential: Low in south of site. Intermediate in north of site. Pollution incidents? None of significance to the site.
Hydrology		Nearest watercourse(s) – 130m south – un-named tertiary stream; flows south. Tributary to River Don 830m south. Water quality - B. Pollution incidents? None of significance to the site. Abstractions? None of significance to the site. Discharge consents? None of significance to the site.
Flood risk		The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low. In accordance with Chapter 10 of the National Planning Policy Framework, a site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1.

4.2 Coal & mining

4.2.1 In July 2011 the Coal Authority (CA) formalised their requirements in relation to planning applications and introduced some new terminology relating to coal mining development areas. This Section provides the necessary mining risk assessment required by the proposed planning application.

4.2.2 Geological maps and BGS logs suggest that no significant (thick & economic) coal seams underlie the site at shallow depth; although the BGS memoir does suggest that the thin coals within the Penistone Flags (beneath this site) were occasionally worked from outcrop of shallow shafts.

4.2.3 The shallowest coal seams beneath this site are expected to be the:

- Cumberworth Thin Coal (thin & uneconomical) at about 10m depth and the;
- Charlton Brook Coal (thin to 0.6m thick) at about 40m depth.

4.2.4 The BGS memoir notes that the Whinmoor coal is extensively worked in the surrounding area. The Whinmoor Coal outcrops about 100m to the north east but does not underlie this site.

4.2.5 It should be noted that seam outcrops plotted on geological maps have been known to be inaccurate by distances in excess of 100m; indeed drilling supervised by Lithos on the nearby development site suggests the geological map is not wholly accurate.

4.2.6 The entire site lies within a Low Risk Area - within the defined coalfield, but no known defined risks have been recorded by the CA; there may still be unrecorded issues.

4.2.7 A CA mining report states that:

- *The property is not in an area that could be affected by underground mining.*
- *The property is not in an area that could be affected by present underground mining*
- *The property is not ins an area where the Coal Authority has plans to grant a license to remove coal using underground methods or where a licence has already been granted*
- *There are no known coal mine entries within, or within 20m of, the boundary of the property*
- *The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.*
- *The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.*
- *The Coal Authority has no record of a mines gas emission requiring action.*
- *The property is not in an area where a notice to withdraw support has been given*

4.2.8 However, it should be noted that it did not become a statutory requirement to maintain and preserve plans of abandoned mines until the Mine (Coal) Regulations Act of 1872 and consequently there may be mineworkings beneath the site for which the Coal Authority have no records.

4.3 Landfills

4.3.1 Known or suspected areas of landfill in the vicinity of the proposed development site are summarised below:

Location	NGR (proximity to site)	Remarks	Source of data
Disused Railway Cutting of A629	SE 295 010 (90m south east)	Inert waste deposited within disused railway cutting. Tipping began December 1980, cease December 1990. License held by South Yorkshire County Council.	Envirocheck report

4.3.2 The area of the infilled railway cutting is about 9,000m^2.

4.4 Hazardous gas

Methane & carbon dioxide

4.4.1 The site could be considered at risk from hazardous ground gas as the eastern boundary is approximately 90m from a recorded landfill. It is not unusual for inert landfills to include some degradable material. However, at present the intended development does not extend to this eastern area, being restricted to approximately one hectare in the far west.

4.4.2 It is considered highly unlikely that any gas from the landfill would migrate to the current development area. No gas monitoring is considered necessary.

4.4.3 Monitoring and characterisation of the ground gas regime may be required if, at a later date, the development extends towards this eastern boundary.

Radon

4.4.4 Requirements with respect radon measures are set out in Building Regulations Approved Document C. Probability bandings (based on the proportion of properties in a given area that exceed the Action Level; currently 200 Bq.m^{-3}) are used to determine whether a property requires no, basic or full measures. At present Approved Document C advocates basic measures for the probability banding 3% to 10% (full measures if >10%).

4.4.5 Information from Landmark suggests that radon protection measures are not required. This is confirmed by the Public Health England UK radon map which indicates that the site lies in an area where less than 1% of homes are estimated to be above the action level.

4.5 Land contamination - Part IIA & planning

4.5.1 Local Authorities have responsibilities with respect to land contamination in the context both of Part IIA of the Environmental Protection Act 1990, and Planning.

4.5.2 The contaminated land regime in Part IIA was introduced specifically to address the historical legacy of land contamination. It applies where there is unacceptable risk, assessed on the basis of the current use and the relevant circumstances of the land. It is not directed to assessing risks in relation to a future use of the land that would require a specific grant of planning permission. This is primarily a task for the planning system, which aims to control development and land use in the future.

Planning

4.5.3 As of 27th March 2012, Planning Policy Statement (PPS23) was replaced by the National Planning Policy Framework (NPPF). The NPPF includes the following with respect to contamination and site investigation:

4.5.4 'Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

4.5.5 Planning policies and decisions should ensure that:

- The site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses, and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the environmental protection act 1990; and

- Adequate site investigation information, prepared by a competent person, is presented'.

4.5.6 Annex 2 of the NPPF states that 'all investigations of land potentially affected by contamination should be carried out in accordance with established procedures (such as BS10175 - 2011, Code of Practice for the Investigation of Potentially Contaminated Sites)'.

This site

4.5.7 The underlying Penistone Flags Sandstone, and Lower Coal Measures, are classified as a Secondary A Aquifer. The nearest surface watercourse is an un-named tributary of the River Don which is located 90m to the south and flows in a southerly direction away from the site. Therefore, the site's environmental setting is considered to be moderate sensitivity.

4.5.8 With respect to human health, the proposed end use (residential) is also sensitive.

4.5.9 Current and historical use of the majority of the site area as farmland, is unlikely to have given rise to significant contamination; however operations within the farmyard area might have.

4.5.10 Nevertheless, it is considered that the site should be suitable for the proposed use subject to implementation of appropriate preparatory works.

4.6 Preliminary conceptual site model

4.6.1 A preliminary conceptual site model, presented as Drawing 2928/5 in Appendix B to this report, has been prepared. Clearly, the conceptual model will be subject to modification in light of data arising from the proposed intrusive ground investigation.

5 GROUND INVESTIGATION DESIGN

5.1 Anticipated ground conditions & potential issues

5.1.1 Ground investigation design has been restricted to the area of intended development, as shown on drawing 2928/3, it does not consider the wider agricultural land discussed in Section 2 (Site Description) above.

5.1.2 Based on the data reviewed in Section 4 (Environmental Setting) anticipated ground conditions are expected to comprise:

Anticipated condition	Remarks
Made ground	Veneer of made ground in former farmyard area
Natural soils	Topsoil over residual soil (gravelly clay)
Bedrock	Pennine Flags Sandstone and Lower Coal Measures (mudstone, siltstone & sandstone) at shallow depth
Mineworkings	Shallow mineworkings are not likely to be present beneath the site
Groundwater	Likely to be at depth in bedrock

5.1.3 Based on the data above and that in Sections 2 (Site Description) and 3 (History), potential ground-related issues associated with this site are likely to include:

Type of issue	Specific issue	Remarks
Potential on-site contamination sources	1. former farmyard and Institute 2. naturally occurring contaminants	1. made ground and spillages of fuel 2. metals

Type of issue	Specific issue	Remarks
Potential off-site contamination sources	1. landfill 2. railway 3. garage	1. migration of hazardous gas 2. elevated concentrations of PAH associated with ash 3. migration of fuel/oil from spills and/or leakages
Potential geotechnical hazards	1. relict buried obstructions	1. associated with former far buildings
Other potential constraints	1. underground and overhead utilities	1. underground and overhead electric

5.2 Preliminary conceptual site model

5.2.1 A preliminary conceptual site model, presented as Drawing No 2928/5 in Appendix B, has been prepared after consideration of all the data presented in Sections 2 to 5.1 inclusive of this report.

5.2.2 Historical plans show that the majority of the development area has been occupied by arable farmland which is not considered likely to have caused significant ground contamination. Nonetheless, activities such as slurry spreading, the discharge of chemicals to ground, and unregulated burial have all occurred on farmland. Potential pollutants associated with farming activity might include any of the following:

Agricultural activity	Potential contaminant
Sewage farming, slurry spreading	Methane, metals, nitrates, oxygen depletion
Plant & animal protection	Pesticides & herbicides
Soil conditioners	Metals, sulphates, PAH
Equipment maintenance	Hydrocarbons, metals
Waste burial, land levelling, backfilling ponds/quarries	Methane, metals, PAH etc
Derelict buildings	Asbestos
Naturally occurring contaminants	Metals

5.2.3 Whilst it is likely that pesticides have been applied during arable use of the land, these are not likely to include the persistent organochloride pesticides such as Dieldrin, Aldrin, DDT etc. Pesticides routinely used on arable crops the UK (Phenoxy Acetic acid herbicide or PAAH) rapidly degrade in soils or leach via rainwater infiltration to groundwater. It is highly unlikely these would be detected by soil sampling and therefore these have not been included within the proposed sampling suite.

5.2.4 Anticipated potential contaminants, within soil and/or groundwater include:

- Inorganics (metals, asbestos)
- Organics (fuels/oils, PAH)

5.2.5 Potential pollutant linkages are shown on the preliminary conceptual site model.

5.2.6 Potential contaminant pathways include:

- Ingestion
- Dermal contact
- Inhalation of contaminated particulates
- Inhalation of vapours
- Surface water run-off, including existing drainage infrastructure
- Downward infiltration of leachable/mobile contaminants to groundwater

Receptors

5.2.7 Potential contaminant receptors include:

- The environment – Secondary A aquifer
- End users of the site (residents)

5.3 Ground investigation design & strategy

5.3.1 The preliminary conceptual site model has used as a basis for design of an appropriate ground investigation, the scope of which is summarised below.

Exploratory holes	Purpose
Twenty Trial Pits	To determine the general nature of soils underlying the site, including the: • nature, distribution and thickness of made ground • nature, degree and extent of contamination • proportion of undesirable elements eg biodegradable matter, foundations etc • suitability of the ground for founding structures and highways
Six Trial Pits	To determine whether soakaways could be utilised for storm water drainage.

5.3.2 Proposed exploratory hole locations should be selected to provide a representative view of the strata beneath the site and to target potential areas of interest identified in Section 5.1 above. A nominal 30m grid spacing should be appropriate within the grassed field, with additional exploratory locations scheduled as necessary in light of the ground conditions actually encountered, likely to be particularly relevant in the farmyard and identifying relict foundations of the former Institute.

5.3.3 Parts of the site were noted to be wet and soft during the site walkover. If ground investigation is not undertaken during drier summer months, it may be necessary to use a tracked excavator.

5.3.4 Representative soil samples of natural and any man-made ground should be taken during the works. The number of soil samples taken should be reflective of the geological complexity actually encountered, but in general about 3 samples should be taken from most exploratory holes.

5.3.5 The investigation should be undertaken in general accordance with:

- BS5930:2015 "Code of practice for site investigation"
- BS10175:2011+A1:2013 "Code of practice for the identification of potentially contaminated sites"
- "Technical Aspects of Site Investigation" – EA R&D Technical Report P5-065/TR (2000)
- "Development of appropriate soil sampling strategies for land contamination" – EA R&D Technical Report P5-066/TR (2001)

5.3.6 The mechanical excavator should be equipped with a breaker to enable excavation through near-surface and buried concrete slabs and obstructions and, where necessary, in bedrock for soakaway tests.

5.3.7 The in-situ shear strengths of any cohesive soils encountered should be determined by use of a hand-held shear vane.

5.3.8 The ground is expected to predominantly comprise residual soils with bedrock at shallow depth, and consequently soakaways may work. Testing should be carried out in at least 6 trial pits in order to assess the suitability of soakaways as a solution for the discharge of surface water run-off

5.3.9 Routine geotechnical soil analysis (moisture content, Atterberg limits, pH, water soluble sulphate) should be scheduled on about 8 samples, with some compaction testing on samples of made ground to assess suitability for use in earthworks ground improvement.

5.3.10 The majority of the site is essentially Greenfield, and therefore testing of potentially contaminated samples should only be required if made ground is encountered in the exploratory holes. However, analysis of topsoil (for pH, metals, TOC, speciated PAH and asbestos ID) should be undertaken in order to confirm its suitability for re-use.

5.3.11 It would be prudent to analyse about 6 topsoil samples to check compliance with BS3882 requirements, via testing for visible contaminants, sharps and clay/sand/silt content.

5.3.12 The gas generation and more specifically migration potential of gas sources (off-site landfill) is considered to be Very Low. No gas monitoring is proposed (see Section 4.4).

5.3.13 On completion of the fieldwork and laboratory testing a comprehensive bound, factual and interpretative report should be issued. This should contain detailed engineering records, laboratory test results, copies of all relevant correspondence and drawings of the site. The report should also include qualitative risk assessment with respect to both controlled waters and human health.

6 CONCLUSIONS & RECOMMENDATIONS

6.1 General

6.1.1 It is understood that Mr J Elmhirst is considering the redevelopment of approximately one hectare in the west of a wider site area with housing.

6.1.2 The main issues considered in this report, and in particular in Sections 3 and 4 are based on a review of historical maps and available geological/environmental data. This report provides an assessment of geoenvironmental issues and implications associated with the proposed residential redevelopment of the site.

6.2 Mining and quarrying

6.2.1 This site is underlain at depth by Pennine Flags Sandstone and Lower Coal Measures bedrock, and the shallowest workable coal seam lies at approximately 40m below the surface. Whilst the site lies within a Coal Authority Low Risk area, no significant risks have been identified, and an intrusive mining investigation will not be required.

6.3 Hazardous gas

6.3.1 An area of landfilling is located to the southeast (disused railway cutting) however this is not considered to present a risk to the development area and no gas monitoring is recommended.

6.3.2 The site is in an area where less than 1% of homes are estimated to be above the radon action level.

6.3.3 As such, no special precautions against ground gas are required.

6.4 Foundations

6.4.1 At present, no geotechnical ground investigation data is available and consequently it is only possible to estimate the ground conditions. Before firm foundation recommendations can be given, it will be necessary to undertake an appropriate ground investigation. However, tentative recommendations are provided below.

6.4.2 Made ground is not generally considered a suitable founding material and foundations should be taken through it, into underlying natural in-situ strata of adequate bearing capacity. Consequently, alternative foundation solutions will be required in any areas of deep made ground (greater than about 1.5m).

6.4.3 All concrete slabs and service ducts will require breaking out during the demolition of existing buildings. Foundations of plots that conflict with relict foundations should be taken to greater depth than the relict foundations and into natural ground of adequate bearing capacity.

6.4.4 The published geological data suggests that the site is underlain by Pennine Flags Sandstone and Lower Coal Measures (mudstone, siltstone & sandstone) with no recorded drift deposits.

6.4.5 Weathered Coal Measures should provide sufficient bearing capacity to enable the adoption of strip footings for two storey housing. Reinforcement, as a precaution against differential settlement, is recommended only where foundation excavations encounter significant lateral and vertical variations in strata.

6.4.6 If rock is encountered at shallow depth, foundations should be placed entirely on rock and not partially on rock and partially on residual soil. This may, depending on surface gradient, necessitate significant over deepening of foundations.

6.5 Highways and external works

6.5.1 Given the sloping nature of the site, there may be a need for retaining walls, underbuild, tanking etc.

6.5.2 Residual soils (gravelly clay/clayey gravel) should yield a CBR of at least 3%. This value should be verified prior to or during construction.

6.6 Soakaways & drainage

6.6.1 Given anticipated ground conditions, soakaways may provide a viable solution for the disposal of surface water, subject to on testing.

6.6.2 Should the site may not lend itself to the adoption of discrete soakaways, ground should have the capacity to absorb surface water run-off, and systems which spread infiltration over a wider area (e.g. an infiltration basin, swales and\or pervious paving) may provide the best solution.

6.6.3 Alternative SUDS options (see CIRIA C697:2007 for further details) include:

- Swales – linear grassed features in which surface water can be stored or conveyed. Where suitable, swales can be designed to allow infiltration.
- Infiltration basins – vegetated depressions designed to store runoff and infiltrate it gradually into the ground.
- Pervious Pavements – provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate into subsurface storage, with subsequent infiltration or controlled discharge. Pavement could be porous (water able to infiltrate across entire surface material; e.g. reinforced grass), or permeable (water infiltrates via joints between concrete blocks).
- Ponds – designed to have permanent pool of water, but with capacity to provide temporary storage controlled discharge.

6.6.4 Yorkshire Water have published a guide[1] for developers and designers outlining their design requirements for surface water attenuation assets.

6.6.5 With respect to detention basins, which should normally be dry, water table levels taken from borehole monitoring wells over 4 consecutive seasons, for at least 3 points in the basin area. Ground conditions must be suitable to allow free drainage from the detention basin all year round by having regard to groundwater levels, and impermeable liners are not to be used.

6.6.6 The guide also discusses required access to flow control chambers, large diameter (i.e. >900mm) surface water storage pipes, and surface water storage tanks.

6.6.7 It is recommended that the developer contact Yorkshire Water Services with respect to capacity in existing foul and surface water sewers in the vicinity of the development area.

6.7 Contamination

6.7.1 The site's environmental setting is considered to be of moderate sensitivity. With respect to human health, the proposed end use (residential) is also sensitive.

6.7.2 Based on observations made during the site walkover, and given the site's former and recent uses, a veneer of made ground is anticipated in the farmyard area and around the former Institute, and it is considered likely that some (probably minor) ground contamination will be present in shallow soils.

6.7.3 The remaining site area is essentially Greenfield and no significant contamination is anticipated. The site has been occupied by arable farmland, none of which is considered likely to have caused significant ground contamination. Nonetheless, activities such as the discharge of chemicals to ground and burning of waste may have occurred.

6.7.4 Consequently, a ground investigation is required in order to assess the degree and extent of any ground contamination, and enable the preparation of a Remediation Strategy.

6.8 Potential development constraints

6.8.1 The overhead electric utilities present a potential development constraint unless they can be relocated. Additional enquiries are required to ascertain the feasibility of such diversionary works and the particular easement required by each service undertaker if they remain in-situ.

6.9 Further investigation

6.9.1 Whilst the site is considered suitable for its current and proposed use, the proposed change in use will require intrusive investigation.

6.9.2 This would include:

- Machine-excavated trial pits to determine near surface ground conditions including depth to bedrock, the presence of obstructions, groundwater and stability
- Geotechnical soils analysis to enable foundation recommendations
- Chemical testing of soil and if necessary groundwater, samples to assess the significance of any contamination, as a result of former land use

6.9.3 An appropriate ground investigation strategy is presented in Section 5.3.

[1] *Design Requirements for Surface Water Attenuation Assets, February 2017.*

Appendix A

General Notes

01 - Environmental setting
Generic notes – geoenvironmental Investigations

General

Third party information obtained from the British Geological Survey (BGS), the Coal Authority, the Local Authority etc is presented in the "Search Responses" Appendix of this Geoenvironmental Report.

Geology, mining & quarrying

In order to establish the geological setting of a site, Lithos refer to BGS maps for the area, and the relevant geological memoir. Further information is sourced by reference to current and historical OS plans.

In July 2011, the Coal Authority (CA) formalised their requirements in relation to planning applications and introduced some new terminology. The CA, using its extensive records has prepared plans for all coalfield Local Planning Authorities, which effectively refines the defined coalfield areas into High Risk and Low Risk areas. High Risk areas are likely to be affected by a range of legacy issues that pose a risk to surface stability, including: mine entries; shallow coal workings; workable coal seam outcrops; mines gas; and previous surface mining sites. Low Risk areas comprise the remainder of the defined coalfield, and are areas where no known defined risks have been recorded; although there may still be unrecorded issues. Where a site lies within either a High or Low Risk area, a mining report is obtained from the CA.

Landfills

Lithos obtain data from Landmark or Groundsure, the Environment Agency and the Local Authority with respect to known areas of landfilling within 250m of the proposed development site. Historical OS plans are also inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips etc.

Radon

Radon is a colourless, odourless gas, which is radioactive. It is formed in strata that contain uranium and radium (most notably granite), and can move though fissures eventually discharging to atmosphere, or the spaces under and within buildings. Where radon occurs in high concentrations, it can pose a risk to health.

In order to assess potential risks associated with radon gas, Lithos refer to BRE Report BR211[1], and the Public Health England website. Advice on the limitation of exposure of the population to radon in buildings was originally published in 1990 by the National Radiological Protection Board (NRPB), which joined the Health Protection Agency (HPA) in 2005; the HPA updated NRPB advice in July 2010[2]. The HPA became part of Public Health England in 2013.

The HPA recommended that the NRPB radon Action Level for homes be retained, and a new Target Level for radon in homes be introduced. The values of the Action Level and Target Level, expressed as the annual average radon concentration in the home, are 200 Bqm^{-3} and 100 Bqm^{-3} respectively. The Target Level was to provide an objective for remedial action in existing homes and preventive action in new homes.

The term 'radon Affected Area' is defined as those parts of the country with >1% of homes estimated to be above the Action Levels. The NRPB first indicated which parts of the country should be regarded as radon Affected Areas in 1990. A more detailed mapping method was developed by the HPA in conjunction with the British Geological Survey in 2007[3]. The level of protection needed is site-specific and can be determined by reference to this mapping on the Public Health England website, which indicates the highest radon potential within each 1km grid square. Each 1km grid square is classified on the basis of the percentage of existing homes within that grid square estimated to have radon concentrations above the Action Level. There are 6 'bands': <1%; 1 to 3%; 3 to 5%; 5 to 10%; 10 to 30%; and >30%.

The NRPB advised that action should be taken to reduce radon concentrations in existing homes if the radon concentration exceeded the Action Level of 200 Bqm^{-3} in room air averaged over a year; ten times the average UK domestic radon concentration. NRPB advice informed changes in the requirements for radon protection in new buildings.

- **Basic** preventive measures are required in new buildings, extensions, conversions and refurbishments if the probability of exceeding the Action Level is **>3%** in England and Wales, and >1% in Scotland and Northern Ireland.
- Provision for further preventive (**Full**) measures is required in new buildings if the probability of exceeding the Action Level is **>10%**.

At present Building Regulations Approved Document C advocates basic measures for the probability banding 3% to 10%, and full measures if >10%. However, Public Health England would like to see all new build include basic measures.

Action and Target Levels should also be applied to non-domestic buildings with public occupancy exceeding 2,000 hours per year and to all schools.

Hydrogeology

Lithos obtain information from the Environment Agency (EA), and Landmark or Groundsure with respect to:

- Groundwater quality
- Recorded pollution incidents
- Licensed groundwater abstractions

From April 2010 the EA's Groundwater Protection Policy uses aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply), but also their role in supporting surface water flows and wetland ecosystems. The aquifer designation data is based on geological mapping provided by the British Geological Survey. The maps are split into two different types of aquifer designation:

- Superficial (Drift) - permeable unconsolidated (loose) deposits. For example, sands and gravels
- Bedrock - solid permeable formations e.g. sandstone, chalk and limestone

The maps display the following aquifer designations:

Principal aquifers: These are layers of rock or superficial deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary aquifers: These include a wide range of rock layers or superficial deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into three types:

- 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
- Secondary B - predominantly lower permeability layers which may store and 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
- Secondary undifferentiated - In most cases, this is because the rock type in question has previously been designated as both a minor and non-aquifer in different locations due to the variable characteristics.

[1] BRE Report BR211, 2015: "Radon: guidance on protective measures for new buildings.

[2] Limitation of Human Exposure to Radon, Documents of the Health Protection Agency - Radiation, Chemical and Environmental Hazards, RCE-15. July 2010.

[3] Miles JCH, Appleton JD, Rees DM, Green BMR, Adlam KAM and Myers AH (2007). Indicative Atlas of Radon in England and Wales. Chilton, HPA-RPD-033.

Unproductive strata: These are rock layers or superficial deposits with low permeability that have negligible significance for water supply or river base flow.

The EA maps only display the principal and secondary aquifers as coloured areas. All uncoloured areas on the map will be unproductive strata. However, for uncoloured areas on the superficial (drift) designation map it is not possible to distinguish between areas of unproductive strata and areas where no superficial deposits are present; to do this, it is necessary to consult the published geological survey maps.

For the purposes of the EA's Groundwater Protection Policy the following default position applies, unless there is site specific information to the contrary:

- If no superficial (drift) aquifers are shown, the bedrock designation is adopted
- In areas where the bedrock designation shows unproductive strata (the uncoloured areas) the superficial designation is adopted
- In all other areas, the more sensitive of the two designations is used (e.g. If secondary superficial overlies principal bedrock, an overall designation of principal is assumed)

The EA have also designated groundwater Source Protection Zones, which are based on proximity to a groundwater source (springs, wells and abstraction boreholes). The size of a Source Protection Zone is a function of the aquifer, volume of groundwater abstracted and the effective rainfall, and may vary from tens to several thousand hectares.

Hydrology

Lithos obtain information from the Environment Agency and Landmark or Groundsure with respect to:

- Surface water quality
- Recorded pollution incidents
- Licensed abstractions (groundwater & surface waters)
- Licensed discharge consents
- Site susceptibility to flooding

The EA have set water quality targets for all rivers. These targets are known as River Quality Objectives (RQOs). The water quality classification scheme used to set RQO planning targets is known as the River Ecosystem scheme. The scheme comprises five classes (RE1 to RE5) which reflect the chemical quality requirements of communities of plants and animals occurring in our rivers.

General Quality Assessment (GQA) grades reflect actual water quality. They are based on the most recent analytical testing undertaken by the EA. There are 6 GQA grades (denoted A to F) defined by the concentrations of biochemical oxygen demand, total ammonia and dissolved oxygen.

The susceptibility of a site to flooding is assessed by reference to a Flood Map on the Environment Agency's website. These maps show natural floodplains - areas potentially at risk of flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas. There are two different kinds of area shown on the Flood Map:

1. Dark blue areas (Flood Zone 3) could be flooded by the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year, or by a river by a flood that has a 1% (1 in 100) or greater chance of happening each year
2. Light blue areas (Flood Zone 2) show the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Where there is no blue shading (Flood Zone 1), there is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

The maps also show all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods.

The Agency's assessment of the likelihood of flooding from rivers and the sea at any location is based on the presence and effect of all flood defences, predicted flood levels, and ground levels.

It should also be noted that as the floodplain shown is the 1 in 100 year, areas outside this may be flooded by more extreme floods (e.g. the 1 in 1000 year flood). Also, parts of the areas shown at risk of flooding will be flooded by lesser floods (e.g. the 1 in 5 year flood). In some places due to the shape of the river valley, the smaller floods will flood a very similar extent to larger floods but to a lesser depth.

If a site falls within a floodplain, it is recommended that a flood survey be undertaken by a specialist who can advise on appropriate mitigating measures; i.e. raising slab levels, provision of storage etc. In accordance with Chapter 10 of the National Planning Policy Framework, a site-specific flood risk assessment is required for: proposals of 1 hectare or greater in Flood Zone 1, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and any new development in Flood Zones 2 and 3.

COMAH & explosive sites

Lithos obtain information from Landmark or Groundsure with respect to Control of Major Accident Hazards (COMAH) or explosive sites within 1km of the proposed development site. Lithos' report refers to any that are present, and recommends that the Client seeks further advice from the HSE.

Areas around COMAH sites (chemical plants etc) are zoned with respect to the implementation of emergency plans. The HSE are a statutory consultee to the local planning authority for all COMAH sites. The COMAH site may have to revise its emergency action plan if development occurs. This might be quite straightforward or could entail significant expenditure. Consequently, the COMAH site may object to a proposed development (although it is the Local Authority who have final say, and they are likely to place more weight on advice from the HSE).

Preliminary conceptual site model

The site's environmental setting (and proposed end use) is used by Lithos to assess the significance of any contamination encountered during the subsequent ground investigation.

Assessment of contaminated land is based on an evaluation of pollutant linkages (source-pathway-receptor). Contaminants within the near surface strata represent a potential source of pollution. The environment (most notably groundwater), site workers and end users are potential receptors.

Potential pollutant linkages are shown on a preliminary conceptual site model (pCSM). A CSM is essentially a cross-section through a site that reflects both the surface topography and underlying geology, and shows surface features of interest. The most significant sources of contamination are then superimposed onto this cross-section together with potential receptors (human health & controlled waters), and plausible pathways between the two. In addition to environmental issues, the CSM should also highlight geotechnical issues.

A pCSM is prepared after consideration of all available "desk study" data, and before design of the ground investigation. Data reviewed should include historical plans (with superimposition on a current-day plan), previous SI reports, geological maps etc. The pCSM, in conjunction with knowledge of site constraints (buildings, services, slopes etc) is used to design the ground investigation.

The revised CSM takes account of data obtained during the ground investigation, including the distribution of made ground, the nature and distribution of contamination etc.

Appendix B

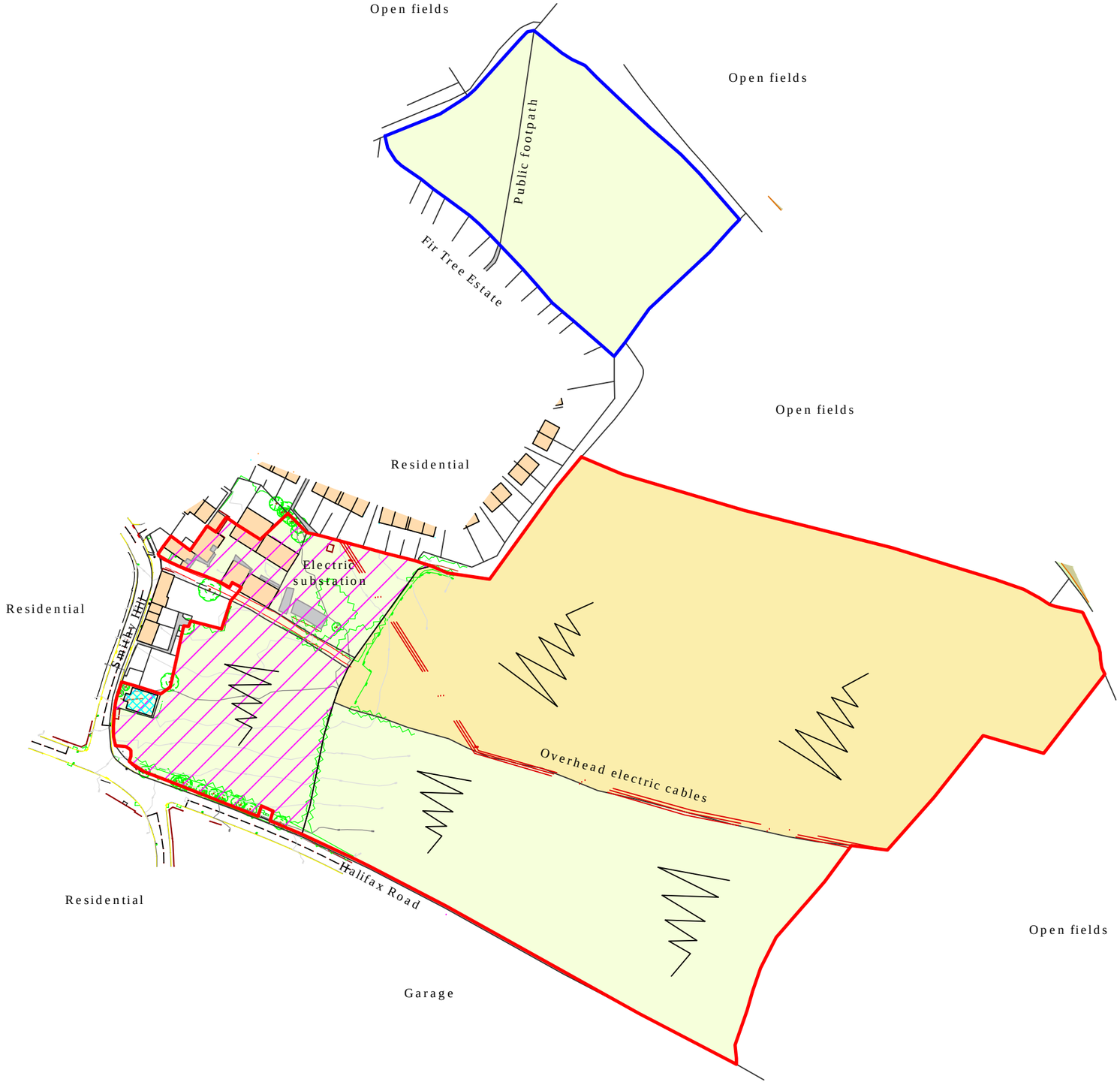
Drawings



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LITHOS CONSULTING
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Tel 01937 545330

CLIENT	MR J ELMHIRST
JOB TITLE	HALIFAX ROAD, THURGOLAND
DRAWING TITLE	SITE LOCATION PLAN
DRAWN	GLM
DATE	12 12 17
CHECKED	REG
DATE	12 12 17
STATUS	FOR COMMENT ☐ DRAFT ☐ FOR APPROVAL ☐ FINAL ☑
SCALE	1:25,000
SHEET	A4
DRAWING NO.	2928/1
REVISION	



N
W E
S

NOTES

- GRASS & OVERGROWN AREAS
- CROPPED FIELD
- BUILDING
- CONCRETE HARDSTAND
- APPROXIMATE FOOTPRINT OF FORMER BUILDING (1932 - 2017)
- APPROXIMATE AREA OF PROPOSED DEVELOPMENT
- APPROXIMATE SITE BOUNDARY (PARCEL A)
- APPROXIMATE SITE BOUNDARY (PARCEL B)

REV.	DESCRIPTION	DATE

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CLIENT

MR J ELMHIRST

JOB TITLE

HALIFAX ROAD,
THURGOLAND

DRAWING TITLE

SITE FEATURES

DRAWN	DATE	STATUS
GLM	12 12 17	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	12 12 17	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2000	A3	2928/3	





























NOTES

- GRASS & OVERGROWN AREAS
- CROPPED FIELD
- BUILDING
- CONCRETE HARDSTAND
- APPROXIMATE SITE BOUNDARY (PARCEL A)
- APPROXIMATE SITE BOUNDARY (PARCEL B)
- LOCATION & ORIENTATION OF PHOTOGRAPH

REV.	DESCRIPTION	DATE

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CLIENT

MR J ELMHIRST

JOB TITLE

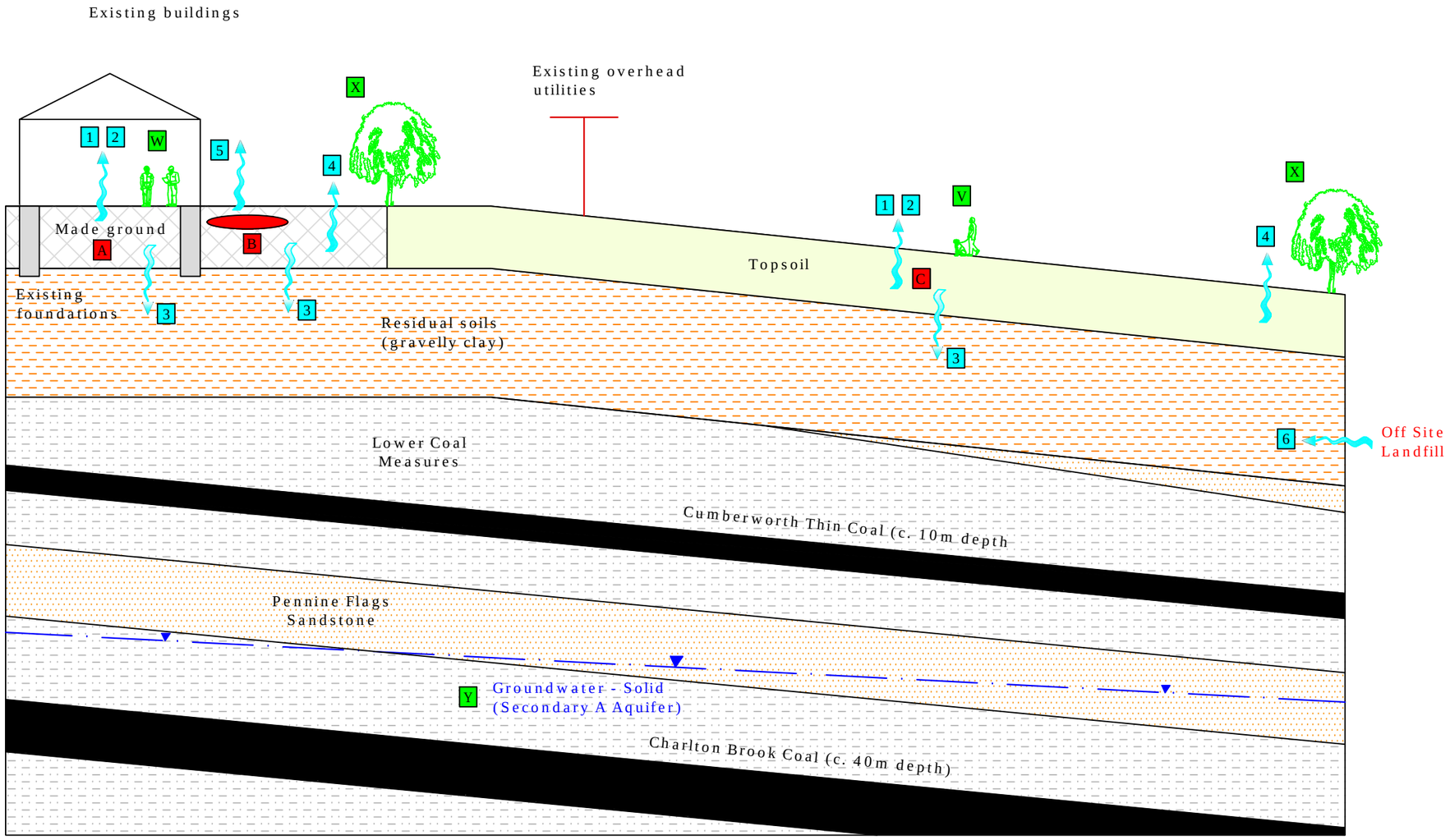
HALIFAX ROAD,
THURGOLAND

DRAWING TITLE

SITE PHOTOGRAPHS

DRAWN	DATE	STATUS
GLM	12 12 17	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	12 12 17	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
1:2500	A3	2928/4	



SOURCES	
A	MADE GROUND (INORGANICS)
B	LEAKAGE/SPILLAGE (ORGANICS)
C	NATURALLY OCCURRING CONTAMINANTS (METALS)

PATHWAYS	
1	DERMAL CONTACT
2	INGESTION/INHALATION
3	LEACHING OF CONTAMINANTS
4	UPTAKE BY PLANTS
5	VOLATILISATION
6	MIGRATION OF GAS

RECEPTORS	
V	END USERS (RESIDENTS)
W	SITE WORKERS
X	VEGETATION
Y	GROUNDWATER

NOTES

REV.	DESCRIPTION	DATE

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CLIENT

MR J ELMHIRST

JOB TITLE

HALIFAX ROAD, THURGOLAND

DRAWING TITLE

PRELIMINARY CONCEPTUAL SITE MODEL

DRAWN	DATE	STATUS
GLM	12 12 17	FOR COMMENT ☐
CHECKED	DATE	FOR APPROVAL ☐
REG	12 12 17	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
Not to scale	A3	2928/5	

Appendix C

Commission

002/2928/GLM

9th November 2017

Registered in England 07068066

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LS22 5DZ

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Mr L Herring
Johnson & Mowat
Coronet House
Queen Street
Leeds
LS1 2TW

Dear Luke

Halifax Road, Thurgoland

Further to your recent invitation, please find below our proposal for undertaking a geotechnical and environmental desk study appraisal of the above land.

It is understood that whilst the site occupies an area of about 7.9 hectares, at this stage you only require consideration an area of 1,100m^2 in the west of the wider site. This quote refers to this smaller portion of the wider site however please note that Lithos could undertake a desk study of the entire site area at no extra cost.

It is understood that the site comprises a single parcel of land which predominantly comprises rough grassland (presumably for animal grazing) which has remained undeveloped throughout its history. However; the north west of the site is occupied by farm buildings (presumably barns etc) with associated hardstand, and a former 'men's institute' (about 160m^2) was located in the south west of (but appears to have recently been demolished).

Brief examination of the relevant geological map suggests the site is underlain by the Lower Coal Measures and the Penistone Flags Sandstone. Thin coal seams are anticipated at shallow (<30m) depth beneath the site. However, it is considered unlikely that these seams have been historically worked.

The site is located within a Coal Mining Development Low Risk Area (within the defined coalfield, but no known defined risks have been recorded by the Coal Authority; there may still be unrecorded issues), and therefore a mining report will be obtained and a desk based mining risk assessment will be undertaken, although at this stage it is considered unlikely that an intrusive mining investigation will be required.

Environmental search data and historical maps (obtained from Landmark or Groundsure), will be reviewed in order to determine whether any past land uses have had any effect on the proposed development. In addition we will visit site to undertake a walkover survey.

The report will include preliminary recommendations with respect to mining, foundations, contamination and hazardous gas. The report will also include recommendations for an appropriate, intrusive ground investigation, together with a costed proposal.

It is anticipated that a final bound report will be available within 3 weeks of receiving your written instruction to proceed. Our lump sum fee for provision of this report is **£** plus VAT.

We will need a Promap or topo survey in CAD format, to provide a base plan for technical drawings etc. If do not have one, we could obtain at cost plus £

With respect to the anticipated ground investigation, this is likely to comprise a days' trial pitting, and possibly a days' rotary drilling (with application for a Permit from the CA), soils analysis, gas monitoring,

and reporting. It is likely that the rotary drilling will need to be undertaken using water as the flushing medium. At this stage, the total cost of such an investigation is likely to be in the range of £ to £ The actual cost would be confirmed on completion of the desk study.

This work will be undertaken in accordance with our Standard Terms and Conditions, a copy of which are enclosed.

It is hoped the above is sufficient for your present needs. However, should you require any further information, please contact the undersigned.

Yours sincerely



George Morton
Senior Engineer

for and on behalf of
LITHOS CONSULTING LIMITED

Terms and Conditions for the Appointment of Lithos Consulting Limited

V005.16

1 DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, unless the context otherwise requires, the following words and expressions have the following meanings:

"Agreement" shall mean these Terms (entitled "Terms and Conditions for the Appointment of Lithos Consulting"), the Proposal, any document recording the Client's unequivocal acceptance of the Proposal and any other documents or parts of other documents expressly referred to in any of the foregoing:

"Client" shall mean the party for whom the Services are being provided by Lithos;

"Documents" shall mean all documents of any kind and includes plans, drawings, reports, programmes, specifications, Bills of Quantities, calculations, letters, e-mails, faxes, memoranda, films and photographs (including negatives), or any other form of record prepared or provided or received by, or on behalf of Lithos, and whether in paper form or stored electronically or on disk, or otherwise;

"Lithos" shall mean Lithos Consulting Limited whose registered office is at Parkhill, Walton Road, Wetherby, West Yorkshire, LS22 5DZ.

"Intellectual Property" includes all rights to, and any interests in, any patents, designs, trade marks, copyright, know-how, trade secrets and any other proprietary rights or forms of intellectual property (protectable by registration or not) in respect of any technology, concept, idea, data, programme or other software (including source and object codes), specification, plan, drawing, schedule, minutes, correspondence, scheme, programme, design, system, process logo, mark, style, or other matter or thing, existing or conceived, used, developed or produced by any person;

"Parties" shall mean the Client and Lithos

"Project" shall mean the project described in the Proposal and any enquiry from the Client on which Lithos has based its Proposal;

"Proposal" means the offer document prepared by Lithos in response to an enquiry or otherwise, in connection with the proposed provision of the Services;

"Services" means the work and services relating to the Project to be provided by Lithos pursuant to the Agreement and as set out in the Proposal and shall include any additions or amendments thereto made in accordance with these Terms;

"Terms" means these terms entitled "Lithos Consulting Terms of Appointment".

1.2 Words importing the singular only shall also include the plural and vice versa, where the context requires.

1.3 Words importing persons or parties shall include firms, corporations and any organisation having legal capacity and vice versa, where the context requires; and words importing a particular gender include all genders.

1.4 The sub-headings to the clauses of these Terms are for convenience only and shall not affect the construction of the Agreement.

1.5 A reference to legislation includes that legislation as from time to time amended, re-enacted or substituted and any Orders in Council, orders, rules, regulations, schemes, warrants, by-laws, directives or codes of practice issued under any such legislation.

1.6 In the event of conflict between the documents forming part of the Agreement, the Proposal shall prevail, followed by the Terms.

2 APPOINTMENT

2.1 The Client agrees to engage Lithos and Lithos agrees to provide the Services in accordance with the provisions of the Agreement.

3 OBLIGATIONS OF LITHOS

3.1 Lithos shall perform the Services using the reasonable standard of skill and care normally exercised by similar professional Environmental firms in performing similar services under similar conditions.

3.2 Lithos shall use all reasonable endeavours to perform the Services in accordance with all relevant environmental and safety legislation.

4 OBLIGATIONS OF THE CLIENT

4.1 Throughout the period of this Agreement the Client shall afford to Lithos or procure the affording to Lithos of access to any site where access is required for the performance of the Services.

4.2 The Client accepts responsibility for ensuring that Lithos is notified in writing of all special site and/or plant conditions, including without prejudice to the generality of the foregoing, the existence and precise location of all underground services, cables, pipes, drains or underground buildings, constructions or any hazards known or suspected by the Client, which the Client shall clearly mark on the ground or identify on accurate location plans supplied to Lithos prior to the commencement of the Services. The Client shall also inform Lithos in writing of any relevant operating procedures including any site safe operating procedures and any other regulations relevant to the carrying out of the Services. The Client shall indemnify Lithos against all costs, claims, demands and expenses arising as a result of any non-disclosure in this respect, including but not limited to indemnification against any action brought by the owner of the land or otherwise.

4.3 If the Client discovers any conflict, defect or other fault in the information or designs provided by Lithos pursuant to the Agreement, he will advise Lithos in writing of such defect, conflict or other fault and Lithos shall have the right to rectify the same or where necessary, to design the solution for rectification of any works carried out by others pursuant the conflicting, defective or in any other way faulty information or designs.

5 INTELLECTUAL PROPERTY

5.1 The copyright in all Intellectual Property prepared by or on behalf of Lithos in connection with the Project for delivery to the Client shall remain vested in Lithos.

5.2 The Client shall have a non-exclusive licence to copy and use such Intellectual Property for purposes directly related to the Project. Such licence shall enable the Client to copy and use the Intellectual Property but solely for its own purposes in connection with the Project and such use shall not include any licence to reproduce any conceptual designs or professional opinions contained therein nor shall it include any license to amend any drawing, design or other Intellectual Property produced by Lithos.

5.3 Should the Client wish to use such Intellectual Property in connection with any other works or for any other purpose not directly related to the Project or wish to pass any Intellectual Property to any third party, it must obtain the prior written consent of Lithos. The giving of such consent shall be at the discretion of Lithos and shall be upon such terms as may be required by Lithos. Lithos shall not be liable for the use by any person of such Intellectual Property for any purpose other than that for which the same were prepared by or on behalf of Lithos.

5.4 Ownership of any proposals submitted to the Client that are not subsequently confirmed as part of the Services to be provided for the Client remain with Lithos and such proposals must not be used as the basis for any future work undertaken by the Client or a third party and no liability can be accepted howsoever arising from such proposals.

5.5 In the event of the Client being in default of payment of any fees or other amounts due, Lithos may suspend further use of the licence on giving 2 days' notice of the intention to do so. Use of the licence may be resumed on receipt of the outstanding amounts.

6 TITLE

6.1 Lithos shall transfer only such title or rights in respect of the Documents as it has, and if any part is purchased from a third party Lithos shall transfer only such title or rights as that party had and has transferred to Lithos.

6.2 Title in the Documents shall remain with and shall not pass to the Client until the amount due under the invoice(s) (including interest and costs) has been paid in full.

6.3 Until title passes, the Client shall hold the Documents as bailee for Lithos and shall store or mark them so that they can at all times be identified as the property of Lithos.

6.4 At any time before title passes (save and except where payment is not due), but only after prior consultation with the Client, Lithos may without any liability to the Client repossess and use or sell all or any of part of the Documents and by doing so terminate the right of the Client to use, sell or otherwise deal in the Documents.

6.5 Lithos may maintain an action for the price of the Documents notwithstanding that title in them has not passed to the Client.

7 CONFIDENTIALITY

7.1 Lithos undertakes not to divulge or disclose to any third party without the written consent of the Client information which is designated confidential by the Client or which can reasonably be considered to be confidential and arises during the performance of the Services unless required to do so by law or necessary in the proper performance of its duties in relation to the Project, or in order to make full frank and proper disclosure to its insurers or intended insurers, or to obtain legal or accounting advice.

7.2 Subject to the above, Lithos shall be permitted to use information related to the Services it provides in connection with the Project for the purposes of marketing its services and in proposals for work of a similar type.

8 THIRD PARTIES

8.1 The Agreement or any part thereof or any benefit or interest thereunder may not be assigned by the Client without the prior written consent of Lithos. The giving of such consent shall be at the discretion of Lithos and Lithos will only agree to an assignment on its terms and in return for payment of a fee by the Client to Lithos to cover Lithos's legal and other costs associated with any assignment.

8.2 The Agreement shall not confer and shall not purport to confer on any third party any benefit or any right to enforce any term of this Agreement for the purposes of the Contracts (Rights of Third Parties) Act 1999 or otherwise.

8.3 Lithos will consider and may consent to any request from the Client for Lithos to enter a collateral warranty with a third party with regard to the Services provided under the Agreement. The giving of such consent shall be at the discretion of Lithos and Lithos will only enter a collateral warranty on its terms and in return for payment of a fee by the Client to Lithos to cover Lithos's legal and other costs associated with any collateral warranty.

9 INSURANCE

9.1 Lithos warrants to the Client that there is in force a policy of Professional Indemnity insurance covering its liabilities for negligence under this Agreement, with a limit of indemnity of £5,000,000 (FIVE MILLION POUNDS) any one claim, save for pollution and contamination claims and asbestos claims both of which carry £2,000,000 (TWO MILLION) in the aggregate cover. This policy is annually renewable and whilst renewal is not automatic, Lithos agrees to use reasonable endeavours to maintain such insurance at all times until six years from the date of the completion (or termination) of the Services under the Agreement, provided such insurance is available at commercially reasonable rates having regard, inter alia, to premiums required and policy terms obtainable.

9.2 If for any period such insurance is not available at commercially reasonable rates, Lithos shall forthwith inform the Client and shall obtain in respect of such period such reduced level of Professional Indemnity insurance as is available and as would be fair and reasonable in the circumstances for Lithos to obtain.

10 LIMITATIONS ON LIABILITY

10.1 Unless otherwise agreed in writing, Lithos's liability under or in connection with the Agreement whether in contract, tort, negligence, breach of statutory duty or otherwise (other than in respect of personal injury or death) shall be limited to and shall not exceed the lesser of either five million pounds in the aggregate (unless it is a pollution, contamination or asbestos claim in which case it is two million pounds in the aggregate) or 10 times the total value of invoices issued to the Client for consultancy work instructed under the Agreement.

10.2 No action or proceedings under or in respect of the Agreement whether in contract, tort, negligence, under statute or otherwise shall be commenced against Lithos after the expiry of a period of six years from the date of the completion (or termination) of the Services under the Agreement.

10.3 Whilst Lithos will scan all potential exploratory locations with a Cable Avoidance Tool, Lithos shall not be liable for any damage to underground services, cables, pipes, drains or underground buildings, constructions and the like which were either not marked on site or for which accurate plans were not provided.

10.4 Lithos shall not be liable for the cost of rectifying any defect, conflict or other fault in the information or designs provided by Lithos or for the cost of designing a solution for and rectifying any subsequent works carried out by others pursuant to the conflicting, defective or in any other way faulty information or designs, unless Lithos has been advised in writing of the same by the Client and has been given the opportunity to rectify the same or where necessary, to design the solution for rectification of any subsequent works carried out by others pursuant to the same.

11 PAYMENT

11.1 Invoices for services rendered will be submitted for payment in accordance with the Proposal.

11.2 The due date for payment is the date of the invoice and the final date for payment is 28 days from the date of the invoice.

11.3 If the Client disputes the amount included for payment in an invoice a written notice must be served on Lithos by the Client not later than 14 days before the final date for payment. If no notice is given the amount due shall be the amount stated in the invoice.

11.4 In the event of failure on the part of the Client to pay any monies in accordance with the foregoing payment provisions, Lithos will be entitled to charge interest on any monies owed to it by the Client, such interest to be at a rate of 8% above the base rate of a clearing bank from time to time calculated from the final date for payment to the date of actual payment on a compound basis.

12 DELAY

12.1 Lithos will comply with any timescale agreed for completion of the Services unless delayed or prevented by circumstances beyond its reasonable control and in the event of any such circumstances arising Lithos undertakes to complete the Services within a reasonable period, but will not be liable to the Client for any delay as a result.

13 TERMINATION

13.1 The Agreement may be terminated by either party in the event of the other making a composition or arrangement with its creditors, becoming bankrupt, or being a company, making a proposal for a voluntary arrangement for a composition of debts, or has a provisional liquidator appointed, or has a winding-up order made, or passes a resolution for voluntary winding-up (except for the purposes of a bona fide scheme of amalgamation or reconstruction), or has an administrator or an administrative receiver appointed to the whole or any part of its assets. Notice of termination must be given to the party which is insolvent by the other party.

13.2 If for any reason the performance of the Services by Lithos is suspended for a period in excess of three calendar months then Lithos shall be entitled to terminate its appointment in respect of the Services by seven days written notice to the Client.

13.3 If the Client shall fail to pay in full any sum due under the terms of the Agreement by the final date for payment for that sum and no effective notice of intention to withhold payment has been issued, Lithos may serve written notice on the Client demanding payment within 14 days of such notice. If the Client shall fail to comply with such notice, Lithos shall be entitled to terminate its employment under the Agreement forthwith.

13.4 Any termination of the appointment of Lithos howsoever caused shall be without prejudice to the right of Lithos to require payment for all services performed up to the date of such termination including but not limited to payment of a fair and reasonable proportion of any figure identified in the Proposal or otherwise for fees in respect of a particular service which Lithos has started, but not completed.

14 NOTICES

14.1 Any notice provided for in the Agreement shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post to the address of the relevant party as may have been notified by each party to the other or, in the absence of notification, to the address of Lithos set out above or to the registered address of the Client.

14.2 Such notice shall be deemed to have been received on the day of delivery if delivered by hand or on the second working day after the day of posting if sent by first class post.

15 ENTIRE AGREEMENT

15.1 The Agreement constitutes the complete and entire agreement between the Client and Lithos with respect to the Services and supersedes any prior oral and/or written warranties, terms, conditions, communications and representations, whether express or implied and any claim against Lithos in respect of the Services can only be made in contract under the provisions of the Agreement and not otherwise under the law or tort or otherwise.

15.2 No amendments, modifications or variation of the Agreement shall be valid unless made in writing and agreed to by both the Client and Lithos; such agreement must be recorded in writing by at least one of the Parties.

15.3 Lithos will not be bound by any standard or printed terms or conditions furnished by the Client in any of its documents unless Lithos specifically states in writing separately from such documents that it intends such terms and conditions to apply.

16 DISPUTES AND GOVERNING LAW

16.1 The Agreement shall be governed by and construed in accordance with English law and the Parties irrevocably and unconditionally submit to the jurisdiction of the English Courts.

16.2 Where the Housing Grants, Construction and Regeneration Act 1996 applies, any dispute between the Parties may be referred to adjudication in accordance with The Scheme for Construction Contracts Regulations 1998 or any amendment or modification thereof being in force at the time of the dispute, as applicable to England, Wales, Scotland and Northern Ireland.

Lewis Whiteley

From: George Morton
Sent: 20 November 2017 17:16
To: 'Luke Herring'
Cc: Reg
Subject: RE: Land off Halifax Road, Thurgoland

Luke

Good afternoon.

Following on from our phone call this afternoon (17.10pm – 20/11/2017) we have agreed that Lithos will include the entire site in our desk study as there is no additional cost involved to Lithos or yourselves.

Yours

George Morton

George Morton
Lithos Consulting Ltd
M 07887 367 346
DD 01937 545 338
www.lithos.co.uk
LITHOS





From: Luke Herring [mailto:luke@johnsonmowat.co.uk]
Sent: 16 November 2017 11:24
To: George Morton <George.Morton@lithos.co.uk>
Cc: Guy Titchmarsh <guy@titchmarshandbagley.com>; Reg <Reg@lithos.co.uk>
Subject: RE: Land off Halifax Road, Thurgoland

Good morning George

Topo now landed and attached. Please keep us updated on progress.

Best Regards

Luke Herring MRTPI
Senior Planner

Johnson Mowat
Planning and Development Consultants

Coronet House, Queen Street, Leeds, LS1 2TW

☎: 0113 887 0120 : www.johnsonmowat.co.uk

From: Luke Herring
Sent: 13 November 2017 14:07

To: 'George Morton' <George.Morton@lithos.co.uk>
Cc: Guy Titchmarsh <guy@titchmarshandbagley.com>; Reg <Reg@lithos.co.uk>
Subject: RE: Land off Halifax Road, Thurgoland

Good afternoon George

Thank you for the quote. I can confirm your fee quote is accepted therefore please proceed with the Desk Study. We are expecting the topo to land in the next few days so we will forward this across once it lands.

The client is Mr Jake Elmhirst, invoicing details below.

Mr Jake Elmhirst, Oswaldkirk Hall, Oswaldkirk, York, YO62 5XT 07903 017 972.

elmhirst23@hotmail.com

Anything further at all then please get in touch.

Best Regards

Luke Herring MRTPI
Senior Planner

Johnson Mowat
Planning and Development Consultants

Coronet House, Queen Street, Leeds, LS1 2TW

☎: 0113 887 0120 : www.johnsonmowat.co.uk

From: George Morton [mailto:George.Morton@lithos.co.uk]
Sent: 09 November 2017 12:02
To: Luke Herring <luke@johnsonmowat.co.uk>
Cc: Guy Titchmarsh <guy@titchmarshandbagley.com>; Reg <Reg@lithos.co.uk>
Subject: RE: Land off Halifax Road, Thurgoland

Dear Luke

Good afternoon.

Please find our quote for your enquiry attached.

Please note that whilst you have asked for a desk study for a small portion of a wider site, and out quote only considers this smaller portion, we could undertake a desk study of the whole site area for no extra cost if required.

However in the future a 'full SI' with intrusive investigations (trial pits, gas monitoring etc) would of course cost quite a bit more due to the larger site area.

I hope that the attached is suitable for your needs. If you have any queries please do not hesitate to get in touch.

Yours

George Morton.

George Morton
Lithos Consulting Ltd
M 07887 367 346
DD 01937 545 338
www.lithos.co.uk

From: Luke Herring [mailto:luke@johnsonmowat.co.uk]
Sent: 08 November 2017 13:58
To: Reg <Reg@lithos.co.uk>
Cc: Guy Titchmarsh <guy@titchmarshandbagley.com>
Subject: Land off Halifax Road, Thurgoland

Reg

Good afternoon, I trust you are well.

We're currently looking at an opportunity for a swift application to be submitted on a piece of safeguarded land in Thurgoland, Barnsley.

I've attached the extent of the clients landownership, however we're only looking at the safeguarded land I've coloured up in pink. Could you provide your quote for preparing a Phase 1 Desk Study to support an outline application and anticipated timescales for a draft? We're looking at a submission before Christmas.

Guy has instructed a topo which we should have in the next week or so.

Any queries at all then please get in touch.

Best Regards

Luke Herring MRTPI
Senior Planner

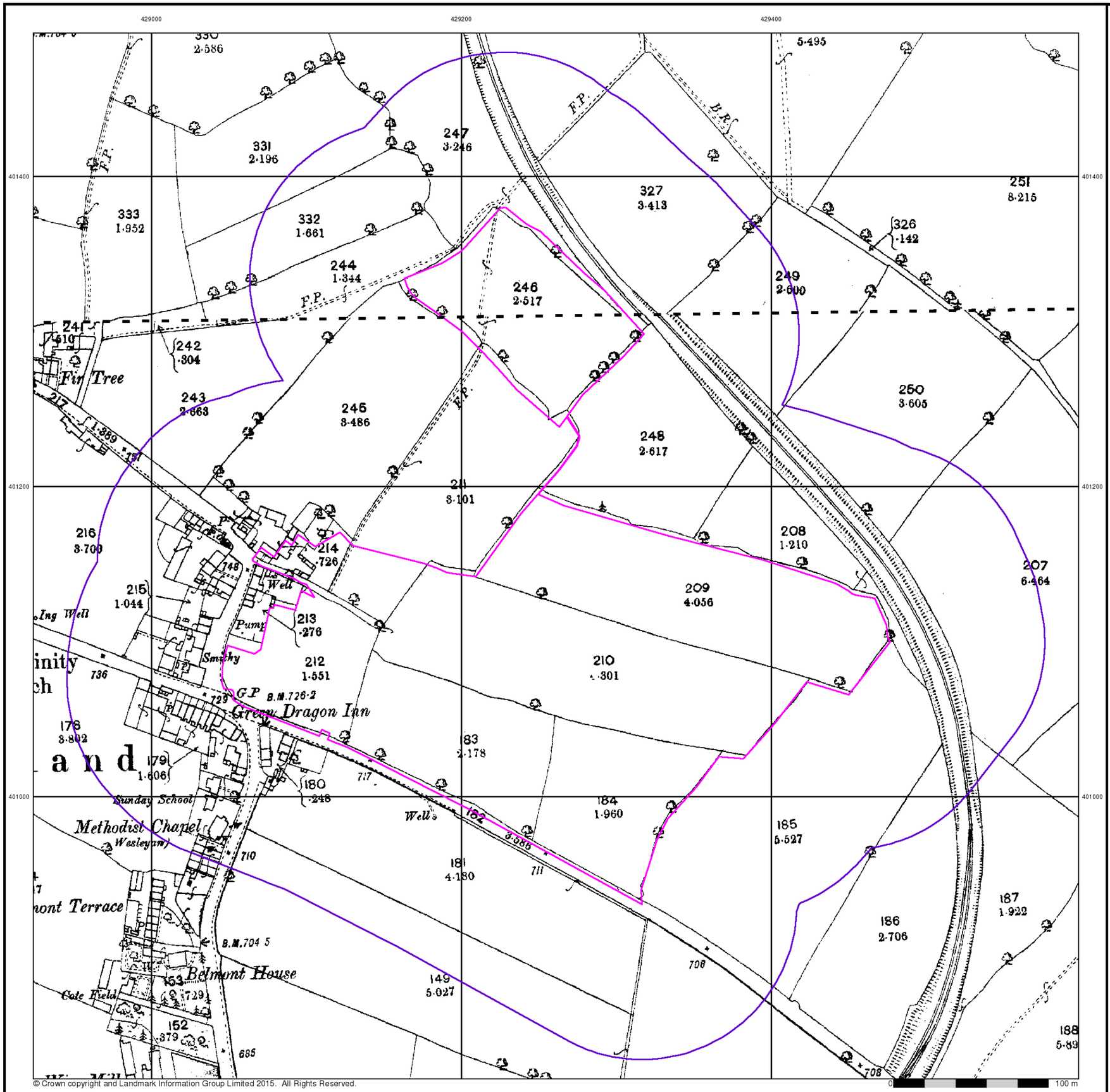
Johnson Mowat
Planning and Development Consultants

Coronet House, Queen Street, Leeds, LS1 2TW

☎: 0113 887 0120 : www.johnsonmowat.co.uk

Appendix D

Historical OS Plans



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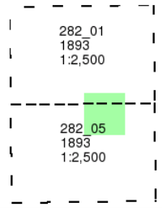
Yorkshire

Published 1893

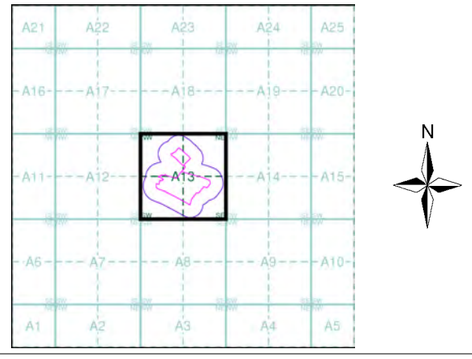
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



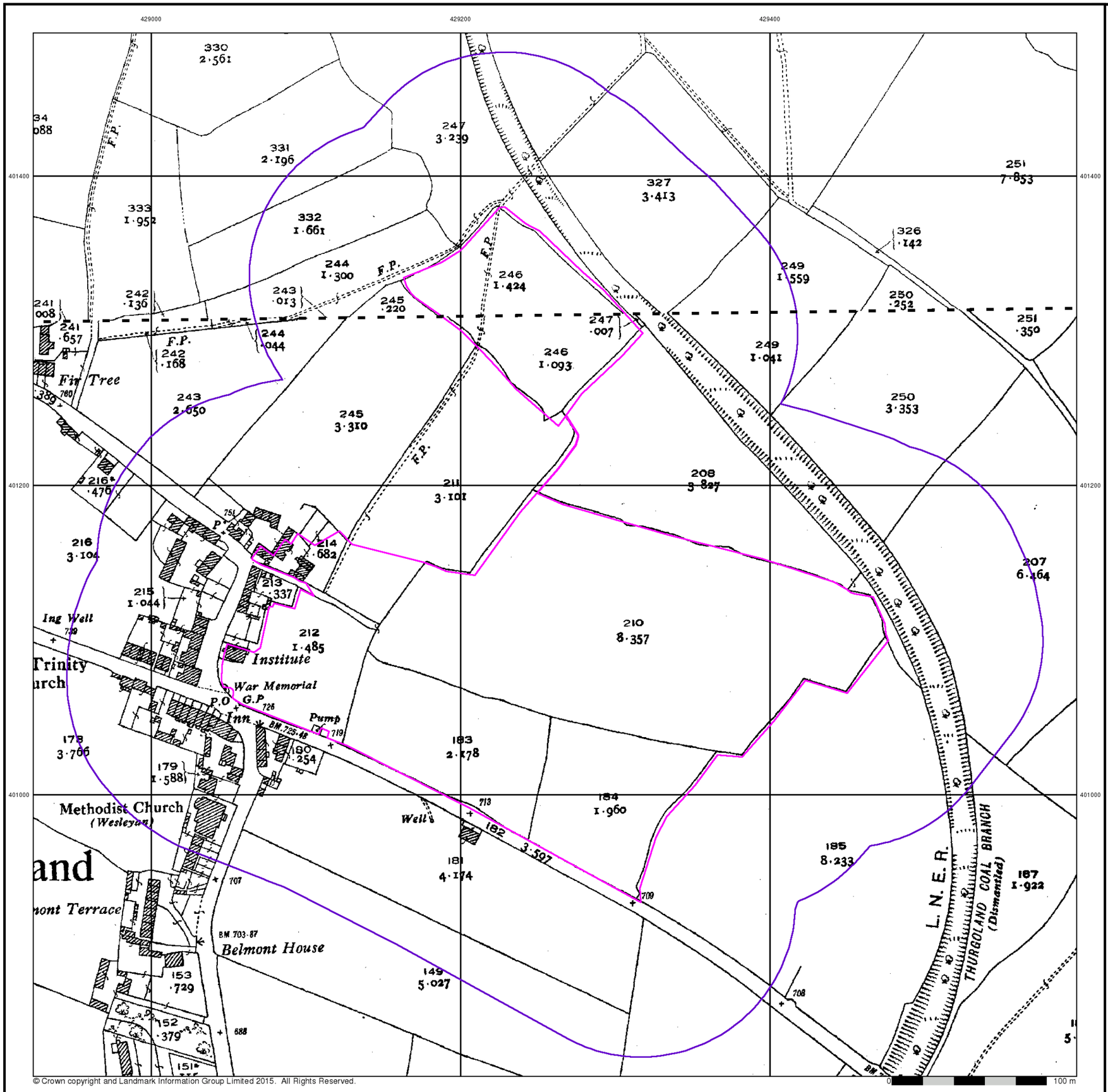
Order Details

Order Number:	147277846_1_1
Customer Ref:	2928
National Grid Reference:	429260, 401140
Slice:	A
Site Area (Ha):	7.04
Search Buffer (m):	100

Site Details

Halifax Road, Thurgoland, BARNSLEY, S35 7AL

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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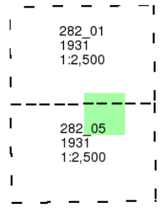
Yorkshire

Published 1931

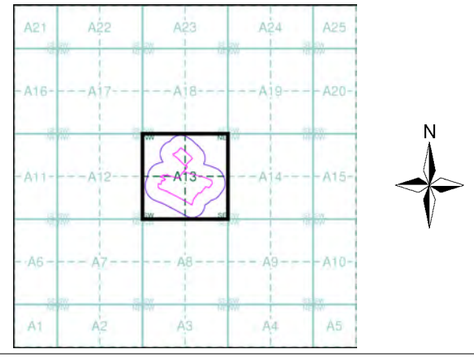
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

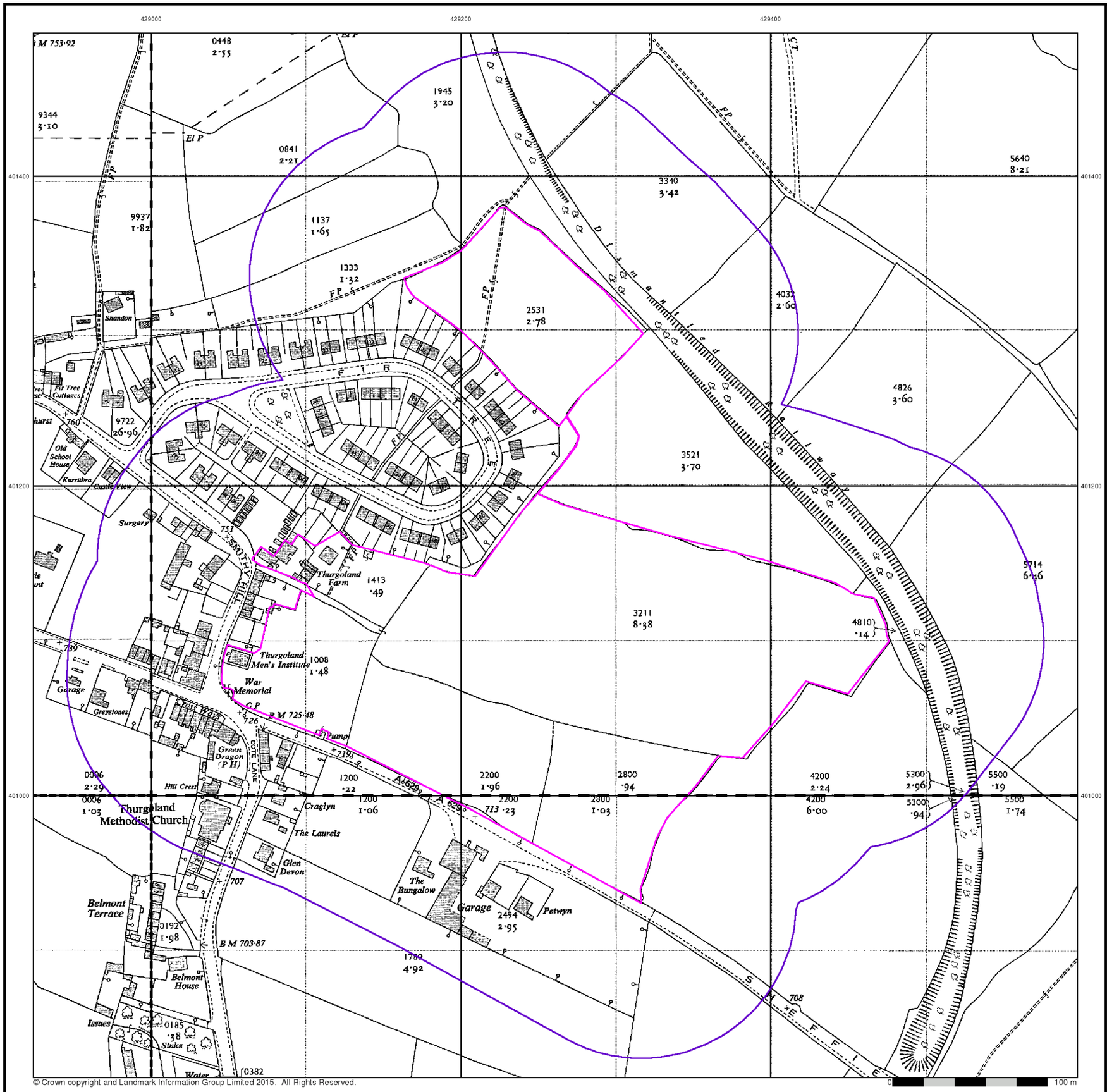
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Customer Ref:	2928
National Grid Reference:	429260, 401140
Slice:	A
Site Area (Ha):	7.04
Search Buffer (m):	100

Site Details

Halifax Road, Thurgoland, BARNSLEY, S35 7AL

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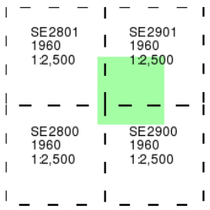
Ordnance Survey Plan

Published 1960

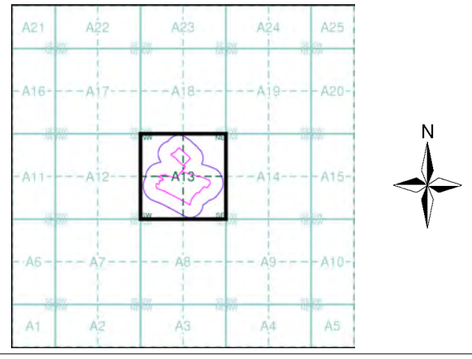
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

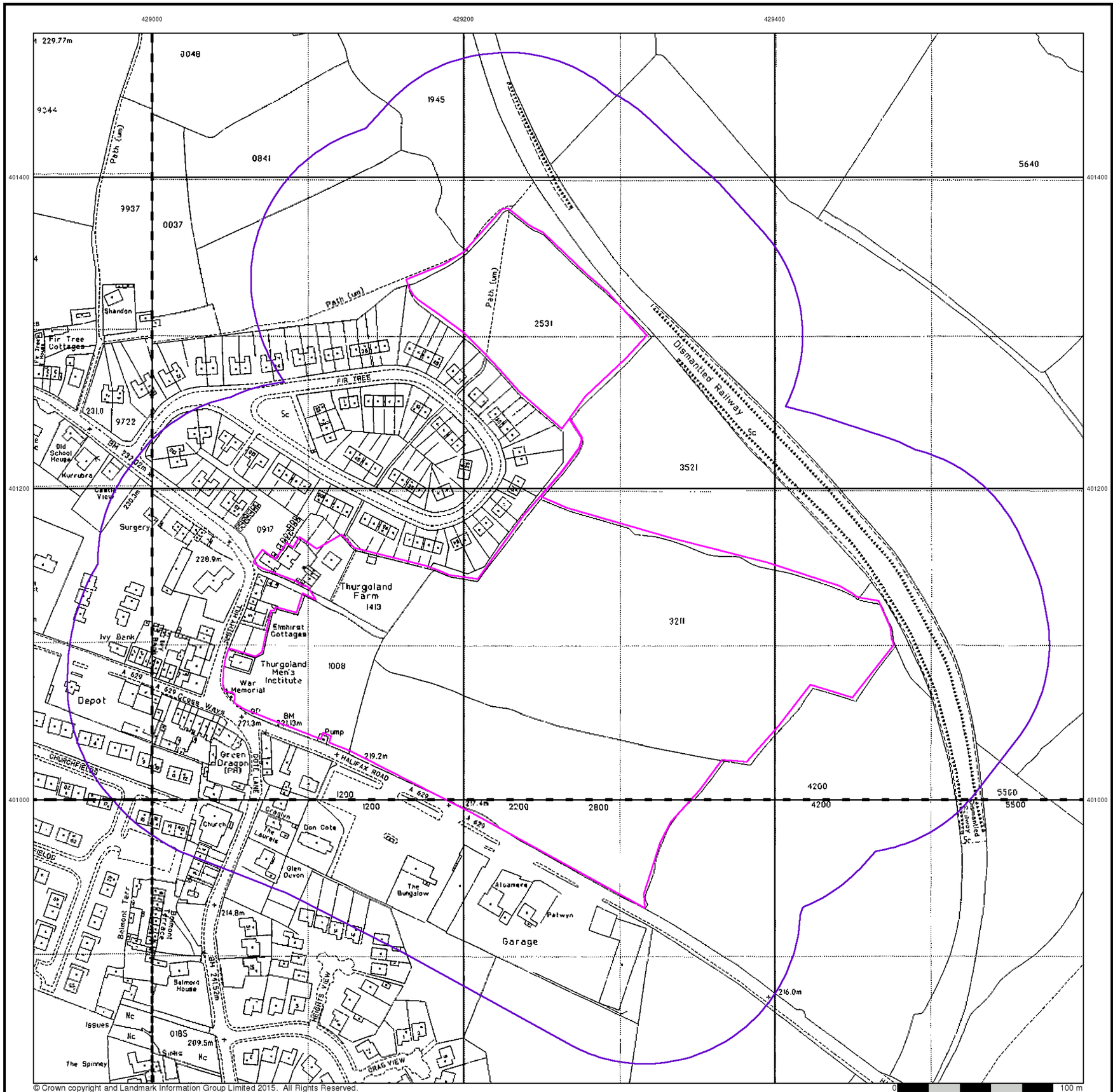
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Customer Ref:	2928
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Slice:	A
Site Area (Ha):	7.04
Search Buffer (m):	100

Site Details

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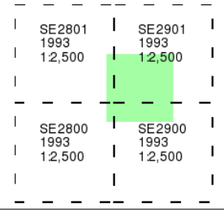
Large-Scale National Grid Data

Published 1993

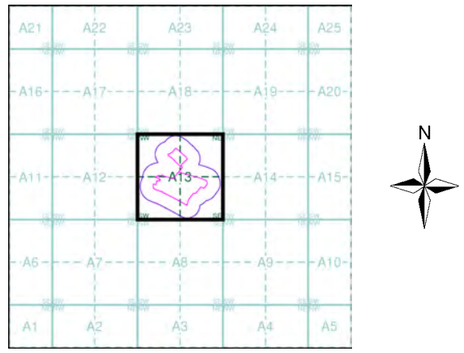
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	147277846_1_1
Customer Ref:	2928
National Grid Reference:	429260, 401140
Slice:	A
Site Area (Ha):	7.04
Search Buffer (m):	100

Site Details

Halifax Road, Thurgoland, BARNSLEY, S35 7AL

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Appendix E

Search Responses & other Correspondence

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
147277846_1_1

Customer Reference:
2928

National Grid Reference:
429260, 401140

Slice:
A

Site Area (Ha):
7.04

Search Buffer (m):
1000

Site Details:

Halifax Road
Thurgoland
BARNSLEY
S35 7AL

Client Details:

Mr G Morton
Lithos Consulting Ltd
Parkhill
Walton Road
Wetherby
LS22 5DZ

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	15
Hazardous Substances	-
Geological	19
Industrial Land Use	31
Sensitive Land Use	34
Data Currency	35
Data Suppliers	40
Useful Contacts	41

Introduction

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

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

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Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England.

Report Version v53.0

LITHOS CONSULTING

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2			2	5
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 3		1		
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3		Yes		
Pollution Incidents to Controlled Waters	pg 4		1		8
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality	pg 5			1	2
River Quality Biology Sampling Points					
Substantiated Pollution Incident Register	pg 5			1	
River Quality Chemistry Sampling Points					
Water Abstractions	pg 6				(*8)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 7	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 8	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 8		3	8	40

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 15		1		1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage	pg 15	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 15		1		1
Potentially Infilled Land (Non-Water)	pg 15		1	2	16
Potentially Infilled Land (Water)	pg 16		3	10	13
Registered Landfill Sites	pg 18		1		
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

LITHOS CONSULTING

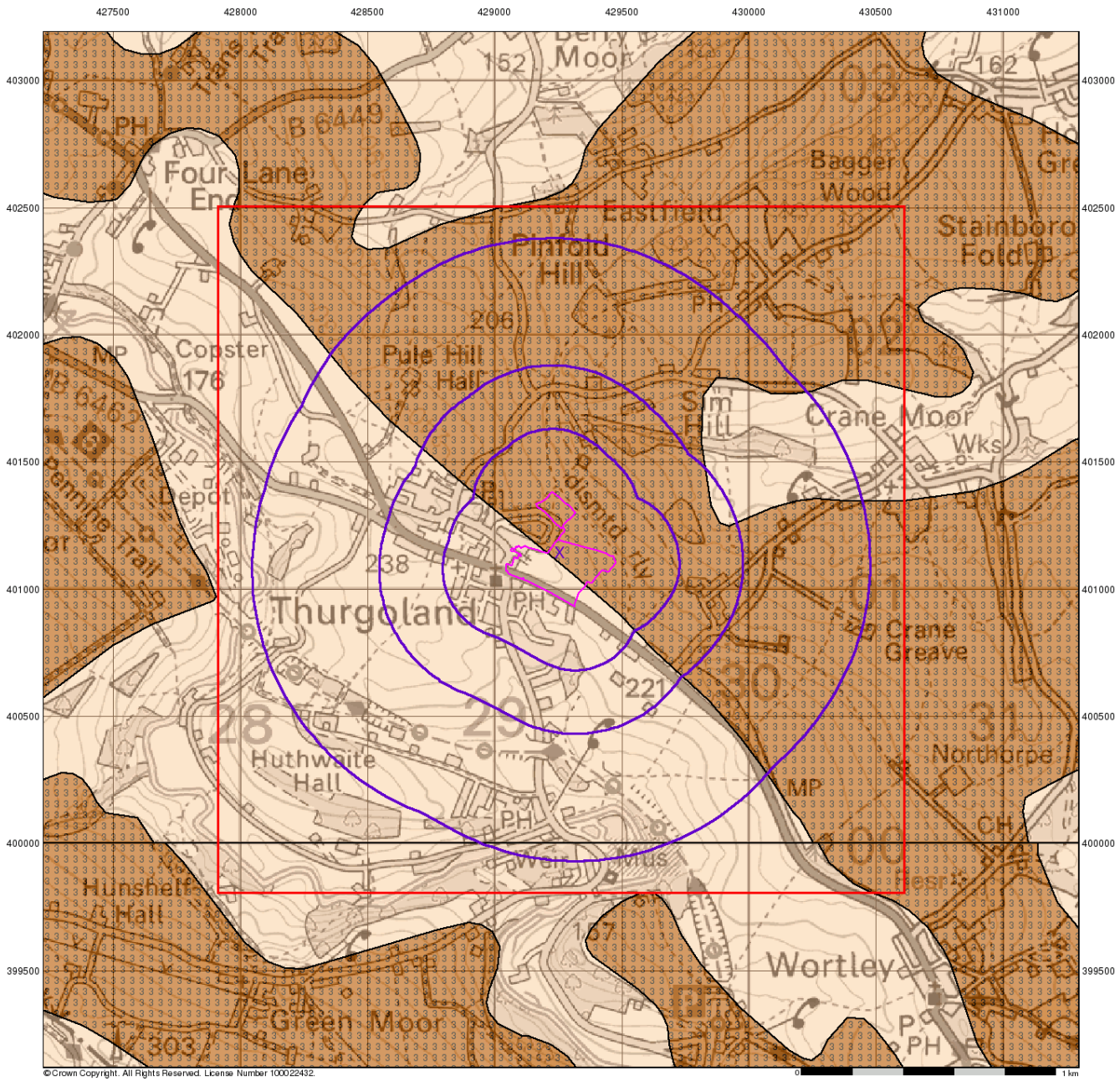
Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 19	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 19	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 25				24
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 29	Yes	n/a	n/a	n/a
Mining Instability	pg 29	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 29	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 29	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 29		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 29	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 29		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 29	Yes	Yes	n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 31		3	7	6
Fuel Station Entries	pg 32		2		
Points of Interest - Commercial Services	pg 32		1	1	1
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 32	1		1	4
Points of Interest - Public Infrastructure	pg 33		1		5
Points of Interest - Recreational and Environmental					
Gas Pipelines					
Underground Electrical Cables					

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 34			1	4
Areas of Adopted Green Belt	pg 34	1			
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 34	1			
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					



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Groundwater Vulnerability

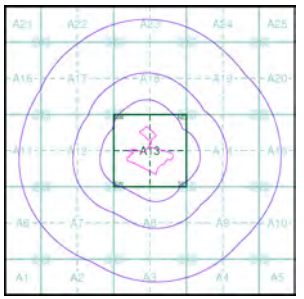
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



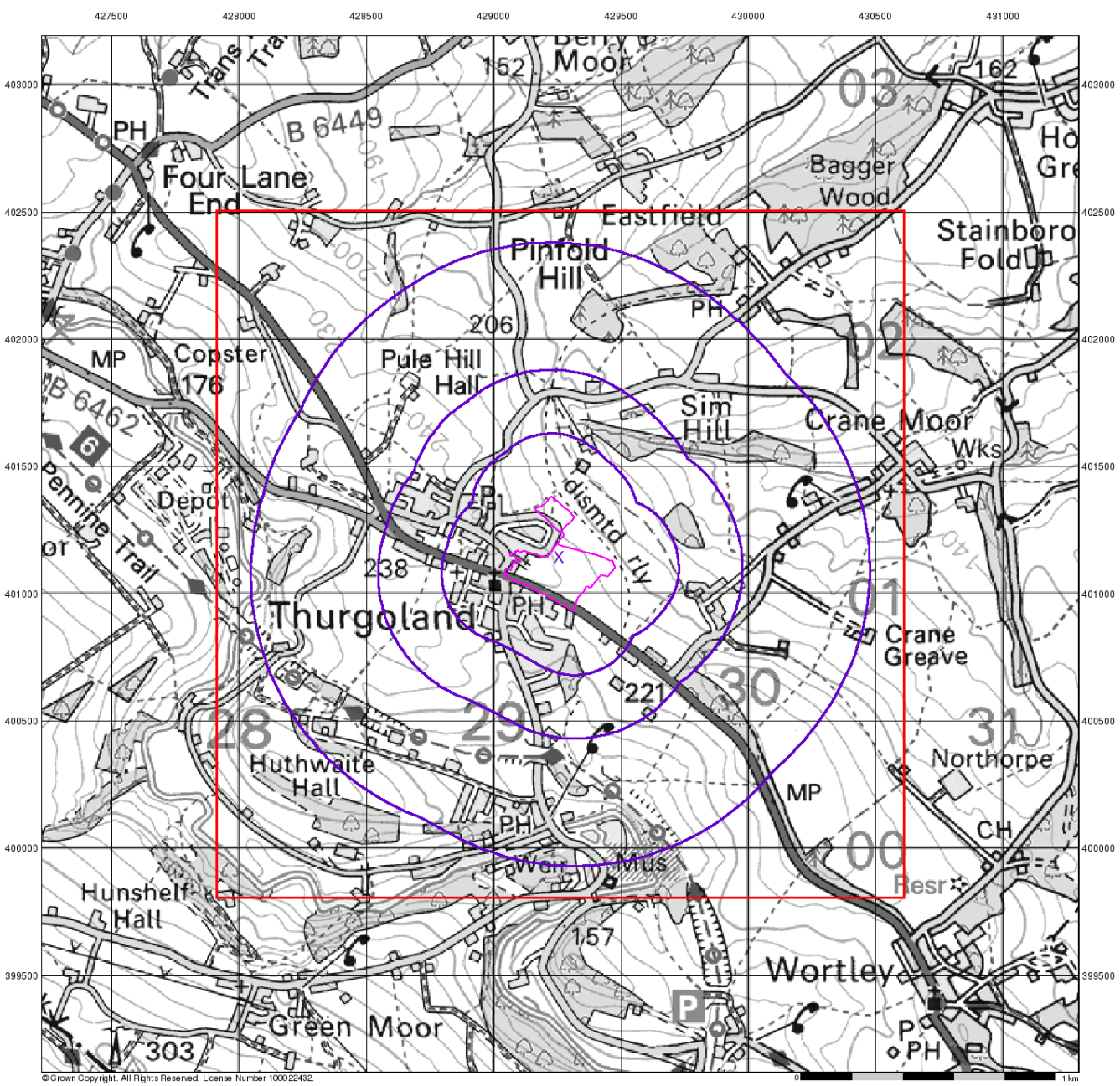
Order Details

Order Number:	147277846_1_1
Customer Ref:	2928
National Grid Reference:	429260, 401140
Slice:	A
Site Area (Ha):	7.04
Search Buffer (m):	1000

Site Details

Halifax Road, Thurgoland, BARNSLEY, S35 7AL

Landmark INFORMATION GROUP
Tel: 0844 844 9952
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Web: www.envirocheck.co.uk



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Source Protection Zones

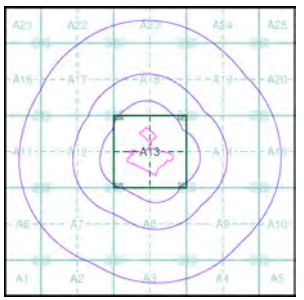
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A

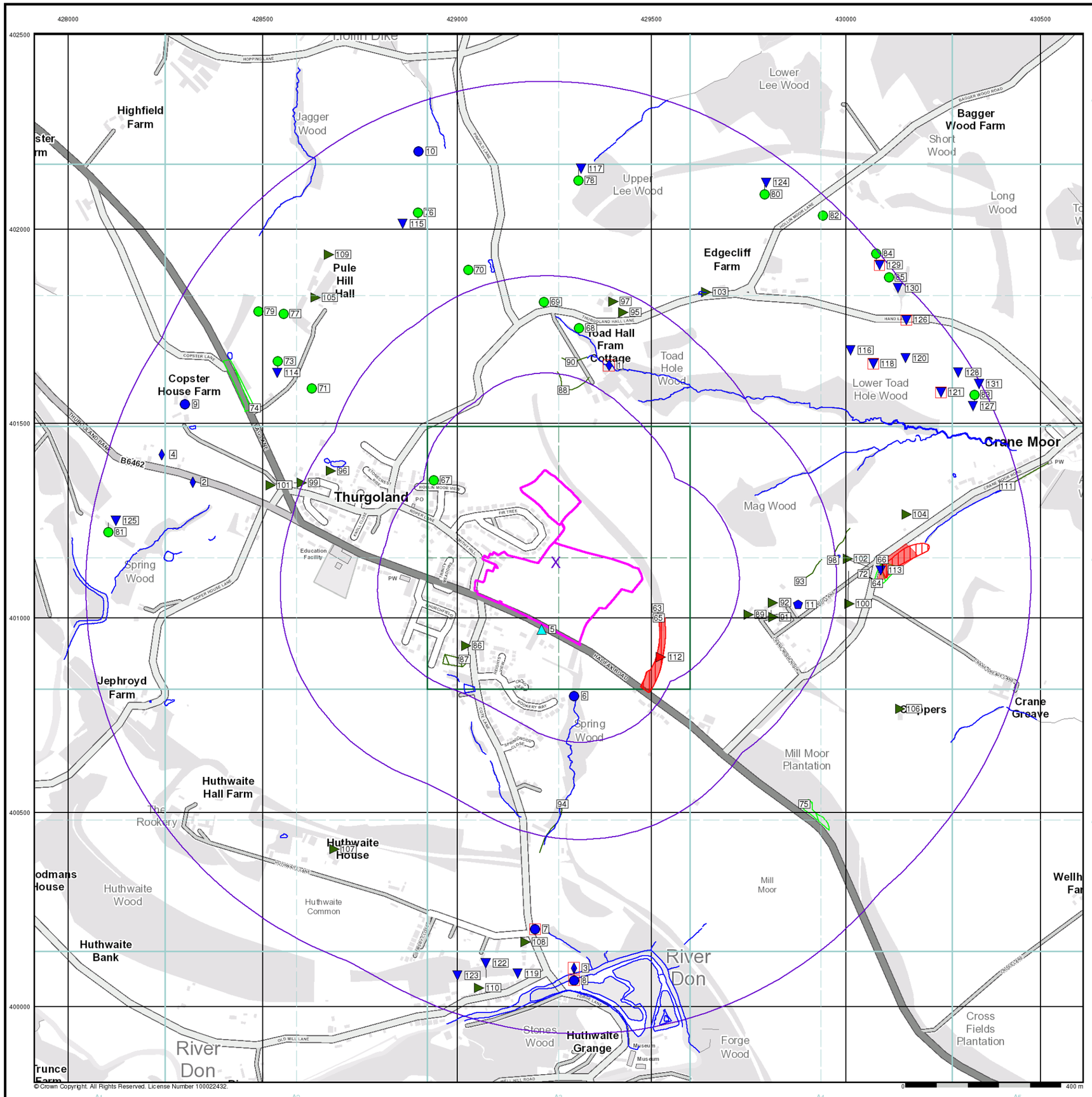


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General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

COMAH Site | Explosive Site | NIHHS Site

- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

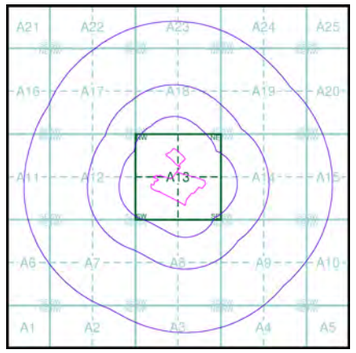
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



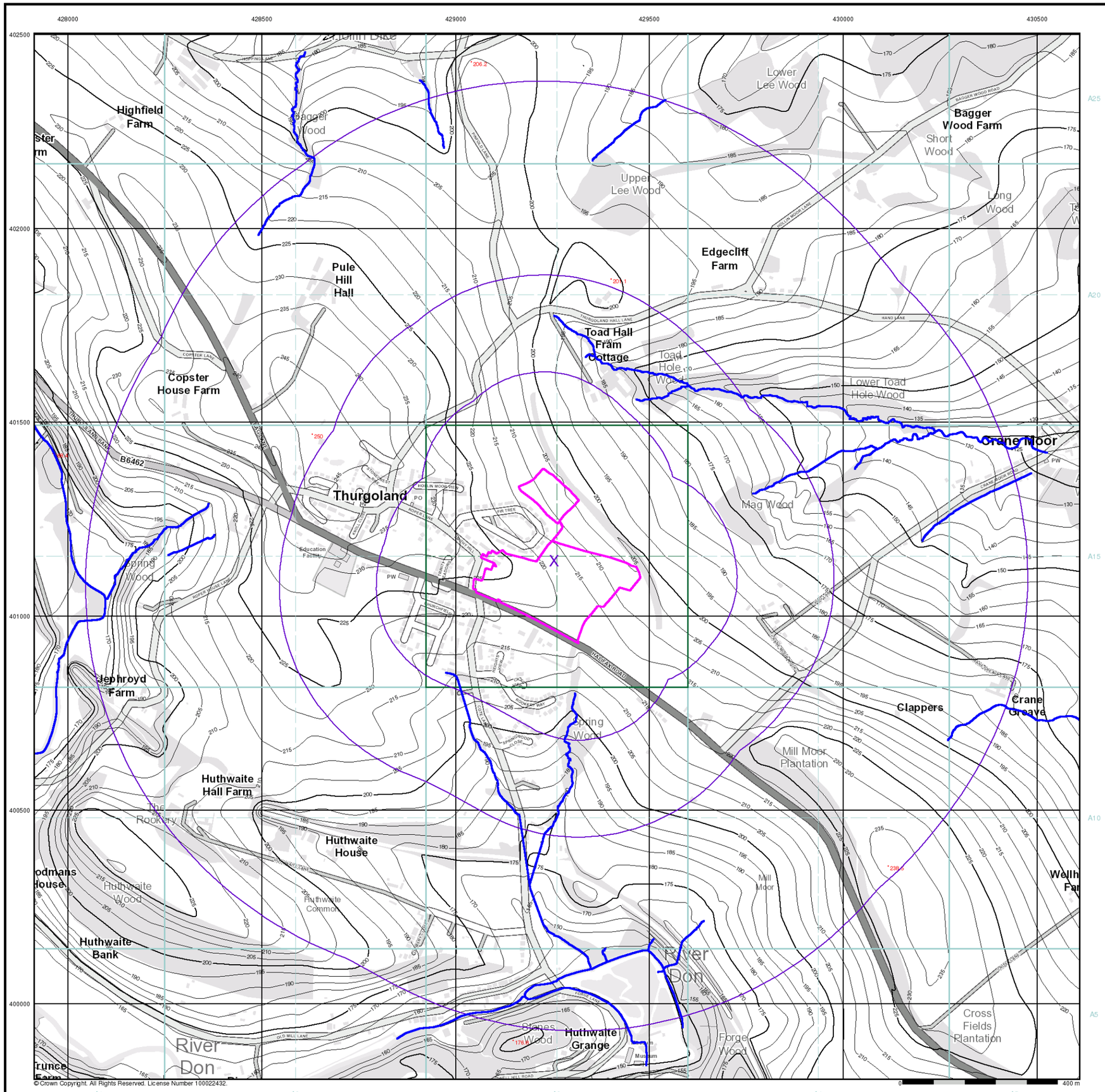
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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

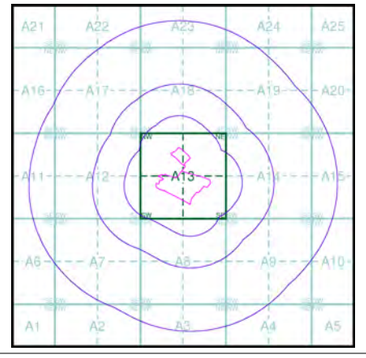
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

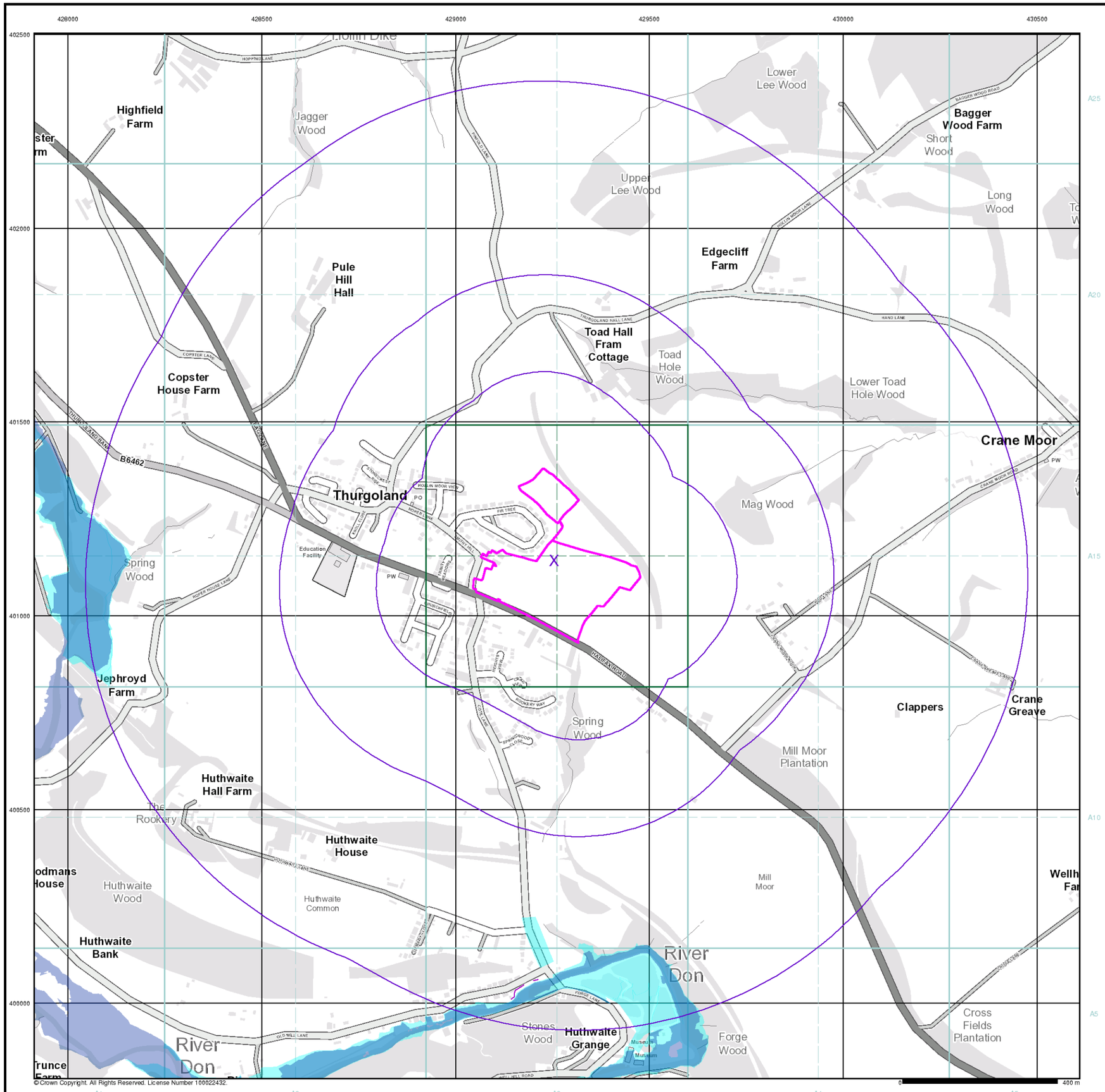
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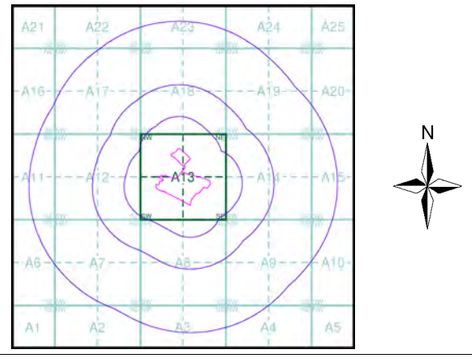
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

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British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 56328 : BGS Reference: SE20SE21
British National Grid (27700) : 428829,401393
Report an issue with this borehole

SE 20 SE/21

FORM P 70
SERIES 680

6-INCH MAP	B'H REGD. No
Yorks. 282 NW (County, Sheet and Qtr.)	
SE 20 SE (Nat. Grid, Sheet & Qtr.)	

Attach tracing from a map or sketch map if possible

Section of COMMERCIAL IN CONFIDENCE THURGOLAND Borehole

5 SEP 1977

Purpose To prove the presence of the Whinmoor Seam

Exact Site O.S. N.G.R. SE/28835/01385

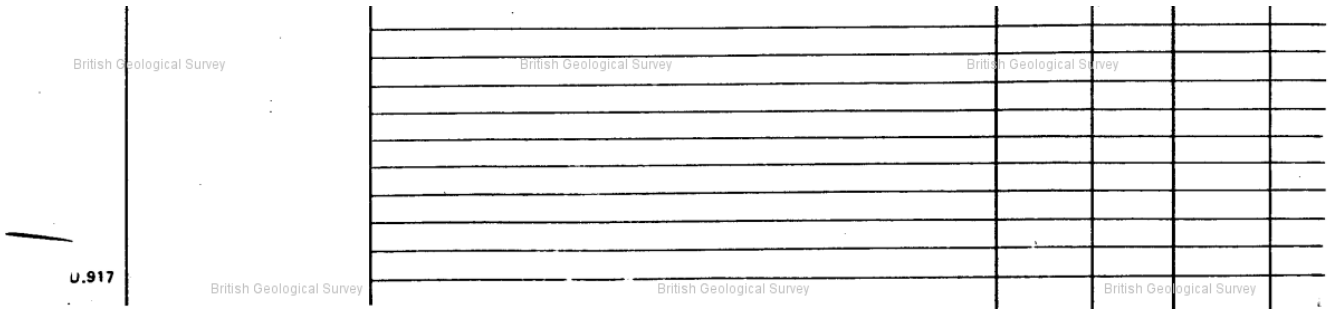
Level at which ~~bore~~ commenced relative to O.D. 240·79 m 790 ~~ft~~ A.O.D. (approx.)

Date of sinking or boring January 1976

Sinker or borer South Yorkshire Area NCB
Cores examined by W. J. Smith.

*Delete as appropriate

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS m or ft*	THICKNESS cm or in*	DEPTH m or ft*	DEPTH cm or in
	OPEN HOLE - no cores taken	5·64 18	6	5·64 18	6
	Weathered silty mudstone with ironstone nodules	1·374	6	7·012 3	0
	Weathered siltstone with ironstained fractures and ironstone nodules	0·993	3	8·00 26	3
	Cemented siltstone	0·15	6	8·15 26	9
	Weathered siltstone, slightly micaceous with well preserved plant remains	0·993	3	9·14 30	0
	Grey silty mudstone with large ironstone nodules. Abundant plant remains and ironstained fractures	0·531	9	9·68 31	9
	Grey micaceous siltstone with plant remains, ironstone nodules and ironstained fractures	0·993	3	10·67 35	0
	Grey silty mudstone with plants, ironstained fractures and ironstone nodules	0·28	11	10·95 35	11
	Carbonaceous mudstone and coal	0·02	0½	10·96 35	11½
	Silty mudstone with plants and roots	0·13	5	11·08 36	4½
	Badly ground material (predominantly mudstone-seatearth)	0·301	0	11·38 37	4½
	Mudstone-seatearth with abundant roots and ironstone nodules towards base	1·234	1½	12·65 41	6
	Grey mudstone with plants and ironstone nodules	0·461	6	13·11 43	0
	Grey silty mudstone with plants and roots	0·15	6	13·31 43	6
	Grey mudstone with abundant plants	0·612	0	13·84 45	6
	Inferior COAL	0·01	0½	13·84 45	6½
	Shaly mudstone with coal streaks	0·05	2	13·93 45	8½
	Very inferior COAL	0·01	0½	13·94 45	9
	Shaly mudstone-seatearth	0·06	2½	14·01 45	11½
	Shaly mudstone with plants and ironstone nodules	0·722	4½	14·74 48	4
	Grey silty mudstone, slightly micaceous with abundant plants and occasional ironstained fractures	0·062	2	15·35 50	6
	Grey micaceous siltstone with ironstained fractures and plant remains	1·023	4	16·41 53	10
	BOTTOM OF HOLE			16·41 53	10



British Geological Survey

The Coal Authority

Resolving the impacts of mining

CON29M Non-Residential Mining Report





HALIFAX ROAD
THURGOLAND BARNSLEY
SOUTH YORKSHIRE



Date of enquiry:	21 November 2017
Date enquiry received:	21 November 2017
Issue date:	21 November 2017
Our reference:	51001697906001
Your reference:	147281577_1 |

CON29M Non-Residential Mining Report

This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Client name

LANDMARK INFORMATION GROUP LIMITED

Enquiry address

HALIFAX ROAD, THURGOLAND, BARNSLEY, SOUTH YORKSHIRE



Approximate position of property

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200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

/company/the-coal-authority
/thecoalauthority
/coalauthority

Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	No
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	No
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is not within a surface area that could be affected by past underground mining.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining
The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining
There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. Coal mining subsidence
The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10. Mine gas
The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining
The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

12. Withdrawal of support
The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13. Working facilities order
The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

15. Information from the Cheshire Brine Subsidence Compensation Board
The property lies outside the Cheshire Brine Compensation District.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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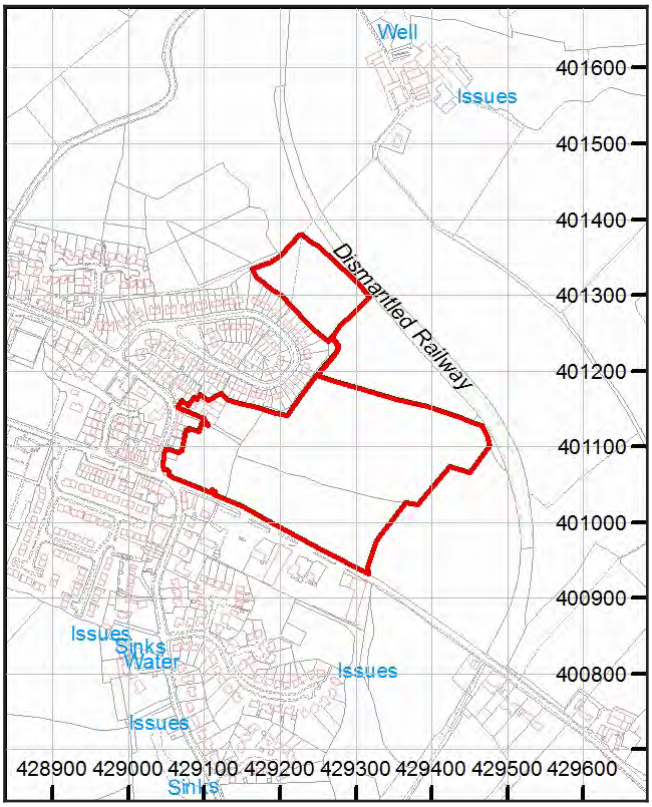
Alternative formats

If you would like this report in an alternative format, please contact our communications team.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



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