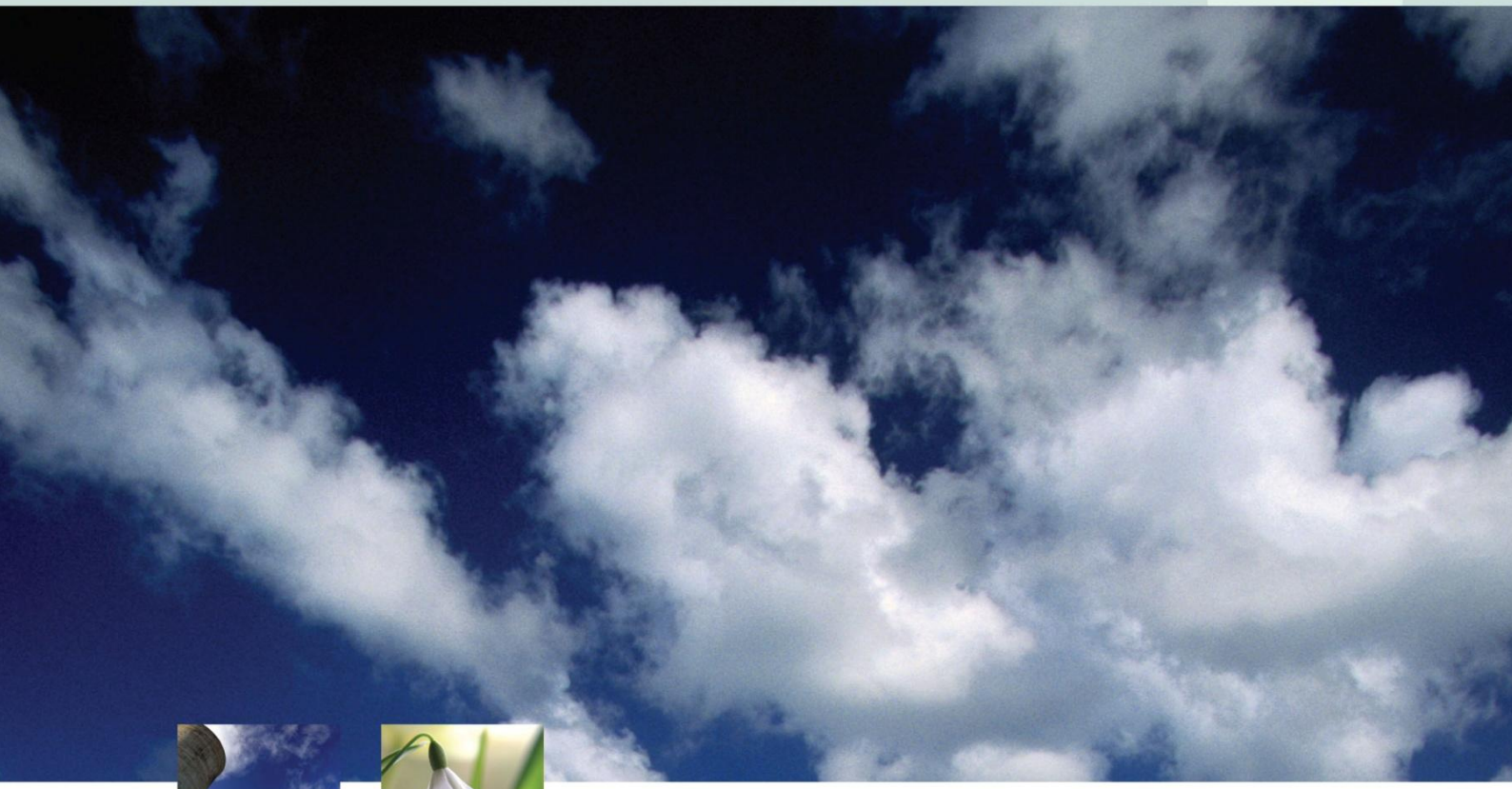

Site Condition Report
New Bespoke Permit Application

Clean Power (UK) Ltd
Wheldon Energy Recovery Centre

Date:
December 2013

Project Issue Number:
SOL1213CPP09_AB

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INTRODUCTION

This Application Site Report has been prepared by Sol Environment Ltd on the behalf of Clean Power (UK) Ltd (hereafter referred to as "the applicant") in support of a Bespoke Installation Permit Application for the proposed operation of Clean Power Properties waste to energy plant utilising Advanced Conversion Technologies (ACT), pyrolysis and anaerobic digestion located at Wheldon Road, Wheldon, Castleford, WF10 4SX (the 'site').

This document represents the Application Site Condition Report (ASCR) submitted as part of the Application package to the Environment Agency (EA) (Sol Environment Ref. SOL1213CPP09_AB) and has relied on information supplied by the site and various third party information sources (See Section 2) submitted as part of the planning application process.

The proposed process will incorporate ACT technologies, pyrolysis with associated upstream processing and anaerobic digestion for the generation of renewable energy. The proposed development is a bespoke energy recovery centre that has been designed to recover all available resources from mixed solid waste feedstocks. The proposed development integrates the above technologies to provide a single treatment facility for solid wastes that would otherwise be destined for landfill or incineration.

The treatment process will be permitted by the Environment Agency as a Waste Recovery Operation and be operated in accordance with the EPR 2010 Regulations.

The proposed pyrolysation process meets the description of an Installation as defined by Section 5.1 *'Incineration and Co-Incineration Waste,'* Paragraph A(1)b namely;

"*The incineration of non-hazardous waste in an incineration or co-incineration plant with a capacity exceeding 3 tonnes per hour*"

The proposed Autoclave and Anaerobic Digestion processes are described within Section 5.4 *'Disposal, recovery or a mix of disposal and recovery of non-hazardous waste,'* Paragraph A(1)b(i) and (ii) namely;

'Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment is anaerobic digestion) involving one or more of the following activities and excluding activities covered by Council Directive 91/271/EEC, by –

- *(i) Biological treatment*
- *(ii) Pre-treatment of waste for incineration or co-incineration*

The proposed technologies meet the definition of a renewable technology as per Article 2 of the EC Directive 2009/28/EC on the '*promotion and use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC*', also referred to as the Renewable Energy Directive 2009.

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

1. Site Details

Name of the Applicant	Clean Power (UK) Ltd
Activity Address	Wheldon Road, Wheldon, Castleford, WF10 4SX.
National Grid Reference	OS X (Eastings) 443969 OS Y (Northings) 426218

Document References and dates for the Site Condition Report at permit application and surrender	EP Application Site Condition Report, Clean Power Properties Ltd Pre-Application Case Reference: EPR/DP3936EY/A001 Sol document reference and date: SOL1213CPP09_AB_ASCR
Document Reference and Site Plans	Annex A of this report: • Figure A1 – Site Location • Figure A2 – Proposed Site Layout Annex B: Ground Conditions Baseline Phase 1 Study Annex E: Conceptual Model

2. Condition of Land at Permit Issue

2.1 Environmental Setting

2.1.1 Site Location

The location of the subject Site is shown in Figure A1, centered at approximate National Grid Reference OS X (Eastings) 443969; OS Y (Northings) 426218. The proposed site layout is shown in Figure A2.

The site covers approximately 2.4ha which forms part of a larger 4.8ha site, and is irregular in shape. The majority of the site is currently occupied by grass, trees and a mixture of other overgrown vegetation and hardstanding concrete. The site is situated off Wheldon Road to the east of Castleford town centre. The site is currently owned by Network Rail and lies directly north of a railway line.

The site previously formed part of the Wheldale Collieries and was subsequently partly used as railway sidings and therefore constitutes previously developed land.

The site is bound to the north by Wheldon Road, to the east by the Wheldale Green Energy Park, to the south by the railway line and to the east by a disused mineral railway line (on embankment). The immediate surrounding area is occupied by a mix of industrial uses. The Castleford Tigers stadium is located to the north-west and west, with some residential properties and a sewage treatment works to the north-east, Fairburn and Newton Ings Nature Reserve to the north and public open space and residential properties to the south and south-west.

Table 2.1 provides further information in relation to the site.

Table 2.1 Site Setting	
Direction	**Description**
North	Wheldon Road River Aire Undeveloped Land Residential Area: Ledston
North East	A1 (M), A1246 Residential Area: Fairburn
East	A1 (M), A1246 Well Wood, The Green, Whin Covert Residential Area: Burton Salmon.
South East	Residential Area: Byram, Brotherton
South	M62 Queen's Park Residential Area: Castleford
South West	M62 Saville Park Residential Area: Castleford, Glasshoughton, Normanton Normanton Industrial Estate
West	A656, A6032, A639 Undeveloped Land Residential Area: Castleford
North West	Residential Area: Allerton Bywater Aire & Calder Navigation, River Calder

The Environment Agency flood zone database indicates that the majority of the site is located within Flood Zone 1, which is defined in the Technical Guidance to the NPPF as land with an annual probability of flooding of less than 0.1% (low risk).

However, the database shows that the north western boundary of the site lies within Flood Zone 2 (medium risk). This flood zone relates to land that has an annual probability of flooding of 1% to 0.1% in any year.

A Flood Risk Assessment (FRA) was carried out in the planning application to ensure accordance with the NPPF Technical Guidance. This Flood Risk Assessment has been included in Annex C4 of the main application document (SOL1213CPP09_AB – Volume 1).

2.1.2 Geology, Hydrogeology and Surface Waters

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

- Environment Agency Groundwater Vulnerability Digital Maps.
- Information provided by an environmental database report (GroundSure).
- Geological maps produced by the British Geological Survey (BGS) and the BGS Geology of Britain Viewer (http://maps.bgs.ac.uk/geologyviewer).
- MAGIC http://magic.defra.gov.uk)
- BGS Borehole Record Viewer (http://www.bgs.ac.uk/data/boreholescans/home.html)

Geology

According to the relevant British Geological Survey (BGS) Solid and Drift Geology Map of the area (Sheet 78: Wakefield) and the BGS Geology of Britain Viewer the site is directly underlain by the Pennine Middle Coal Measures Formation.

The BGS Lexicon of Named Rock Units describes the Pennine Middle Coal Measures Formation as;
'Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit.'

The majority of the site is not underlain by superficial deposits. However, the published geology suggests that the far northwest corner of the site is likely to be underlain by alluvial deposits comprising clay, silt and gravel overlying the units of the Pennine Middle Coal Measures. The GroundSure Report records the permeability of these superficial deposits as very low to high through intergranular flow, which is assumed to relate to the areas where the alluvial deposits are present.

A fault runs through the centre of the site from south west to north east (coal seam, inferred). Six further faults, also inferred as coal seams, are located within 500m of the site. Colliery waste tips are recorded in several locations on the site suggesting that Made Ground is likely to be present. Made Ground is also likely to be widespread across the site associated with the previous development.

According to data issued by the National Radiological Protection Board (NRPB) in 2002 (now the Health Protection Agency, the land is located in an area where less than 1% of residential properties are above the action level for Radon as set by the NRPB. No radon protection measures are considered necessary by the BGS.

The BGS GeoIndex shows one borehole located 22m to the north-east of the site (ref: SE42NW13 – Wheldale Colliery). This borehole was recorded to be 524m deep and is recorded within the index as a shaft drilled within the Wheldale Colliery. The borehole confirms the progression of coal seams underlying the site.

The site is located in an area that may be affected by coal mining. Due to this a Coal Authority Report was issued

(Report Number 00000782-12). The following details were obtained from the Coal Authority Report:

- The property is within the likely influence of 6 coal seams at depths between 180m to 530m last worked in 1961;
- The property is not within the likely zone of influence of any present or proposed underground or surface workings;
- It is stated that there are no known coal entries on-site or within 20m of the boundary (although historical mapping suggests a shaft was located just beyond this, to the east of the site);
- The site does not lie within the influence of any past, present or future opencast mining workings; and
- There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property. However, the adjoining Wheldale Green Energy Park is known to 'capture' methane from the old coal workings and convert them to energy.

Hydrogeology

The hydrogeological characteristic of the geological group identified is summarised below:

- Pennine Middle Coal Measures – Secondary A – permeable 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 formally classified as minor aquifers.
- Superficial Alluvial deposits (far north-west corner of the site) – Secondary A – permeable 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 formally classified as minor aquifers.

There are no groundwater abstraction licenses associated with the site. However, there are eight licensed groundwater abstractions recorded within 1km of the site. The closest of which is located approximately 660m to the south-west of the site which allows the abstraction of groundwater for general cooling and general usage.

The Site is not located in a Groundwater Source Protection Zones (SPZs).

The site is considered to be situated in an area of moderate sensitivity with respect to groundwater resources due to the underlying Secondary A Aquifer. This sensitivity is mitigated somewhat by the absence of any groundwater abstractions within a 500m search radius of the Site and that the site is not situated in a groundwater source protection zone.

Surface Water

There are no surface water features located on site.

The nearest surface water body is the River Aire which is located approximately 450m to the west of the site at its closest point. The EA online mapping shows that the current ecological quality of the River Aire is Poor and the current chemical quality has failed.

According to the GroundSure Report, there are no surface water abstraction licenses associated with the site. However, there are eight surface water abstractions within 1km of the site. The nearest of which is located

approximately 411m to the north of the site and relates to the usage of water for dust suppressions.

2.1.3 Designated Sites

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

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

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

- Sites of Special Scientific Interest (SSSI) established by the 1981 Wildlife and Countryside Act;
- National Nature Reserves (NNR);
- Local Nature Reserves;
- Local Wildlife sites;
- Ancient Woodland.

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

There are no Special Areas of Conservation, Special Protection Areas or Ramsar Sites within 10km of the subject site.

Approximately 500m to the north of the site is the Fairburn and Newton Ings SSSI/LNR.

It is the conclusion of this assessment that the proposed operation will not have any direct or indirect effects on the statutory site described above.

The site is not located within a Nitrate Vulnerable Zone.

The site is located within an Air Quality Management Area with the key pollutant of concern being Nitrogen Dioxide (NO_2).

With respect to sensitive land uses and sensitive receptors, the Site is considered to be located in a low to moderate sensitivity setting.

2.2 Pollution History

2.2.1 Environmental Database Records

The following information has been obtained from a search of a publicly available database of environmental information (GroundSure Environmental Data Report prepared by eMapSite.)

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

Pollution Incidents
There have been no records of pollution incidents relating to the Site.

There are no records of pollution incidences recorded within 250m of the site on the National Incidents Recording System List 1.

Fourteen recorded pollution incidences were recorded within 250m of the site on the National Incidents Recording System List 2, seven of which being minor impacts to land, two being significant impacts to air and minor impacts to land, two being significant impacts to air and land and three being significant impacts to land.

Four entries are located approximately 39m to the north of the site for specific waste materials such as asbestos, household waste and tyres. The impacts to water, air and land were categorised as no impact to minor impact.

Prosecutions
The Council stated that they are not aware of any complaints or prosecutions made against the site or surrounding properties except minor ones relating to fly tipping.

Discharge Consents
There are no records of licensed discharge consents associated with the site or within 500m of the study site boundary.

Authorised or Permitted Processes
There are no Environmental Permits to operate a Pollution Prevention and Control (PPC) Part A(1) (formally known as Integrated Pollution Prevention and Control (IPPC)) process at the site.

There are 4 Part A(1) processes within 500m of the Site. The nearest of which is operated by Yorkshire Water Services Ltd and is located 201m to the north for 'Other Waste Disposal – non-hazardous waste > 50T/D by physico-chemical treatment' (permit number: KP3636LU).

There are no Part A(2) (formally referred to as Local Authority IPPC Authorisation) processes or PPC Part B processes (formally referred to as Local Authority Air Pollution Control Permits) within 500m of the site.

2.2.2 Historical Land Uses

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

The historical maps are presented within Appendix B of the Ground Conditions Baseline Phase 1 Study (Annex B) and a summary of the historical development of the Site and surroundings is included below.

Prior to the mid 1800s, the site was largely undeveloped, although the railway which forms the southern railway was already present. By the late 1800s the site had been developed, accommodating buildings associated with the Wheldale collieries located in the east and pits or soil heaps in the west. It is understood that the colliery was closed in 1987.

Table 2.3 below identifies the historical land use and the resulting potential contaminants on site.

Table 2.3 Historical Land Use

Date	Comments / Observations	Potential Contaminants
1890-1892	• Wheldale collieries were present on the eastern section of the site. • Railway infrastructure and stockpiles were annotated in the west of the site with the colliery buildings in the east. • Wheldon Road was annotated in its current alignment directly to the north of the site and the mineral railway was annotated directly to the west (Castleford and Pontefract Branch). • A gasometer was depicted directly to the north of the site over Wheldon Road. • Castleford was developed to the west of the site with the nearest residential houses to the site directly to the west of the railway line and north of Wheldon Road.	Potential contaminants associated with railway lines: • Organic contaminants such as hydrocarbons, PCBs, PAHs, Solvents and Herbicides. • Metals such as ferrous residues and metal fines. • Asbestos • Ashes and fill • Sulphates
1905-1908	• Little significant changes were apparent to the actual site. • A shaft was now annotated within the colliery buildings directly to the east of the site boundary. • The gasometer directly north of the site was no longer depicted and a sewage works was now annotated directly to the north of Wheldon Road. • Healdfield Brick works was also annotated directly to the south of the railway line which forms the southern boundary of the site.	As above.
1932-1938	• An increase in the number of railway lines and infrastructure within the colliery site was noted as well as increased railway infrastructure present adjacent to the sewage works north of Weldon Road. • A tramway was annotated approximately 50m to the east of the site and a chimney was annotated approximately 50m to the east of the site. • Castleford Tigers football ground was now located to the west.	As above.

1940-1952	• No significant changes to the site itself were apparent. • A gantry extended over Wheldon Road from the sewage works site to the north. • An additional building was depicted to the north of Wheldon Road.	As above.
1961-1972	• No significant changes to the site and surrounding site were apparent. • Spoil heaps were annotated at the west of the site. • By early 1970's the Healdfield Brick works was no longer depicted and was annotated as a refuse tip.	As above.
1981-1985	• No significant changes to the site and surrounding site were apparent. • It is understood that the colliery closed in 1987.	As Above.
1992-1995	• The colliery was no longer annotated and the site appeared to be cleared with the exception of an access road into the site which still remains marked. • All railway infrastructure to the north of Wheldon Road was no longer annotated.	As Above.
2002	• No significant changes to the site and surrounding site were apparent.	As Above.
2011	• No significant changes to the site and surrounding site were apparent.	As Above.

It can be seen that the site and the surrounding area have undergone significant development since the earliest available map (1890). Wheldale Collieries were present on site from the time of the earliest available mapping and it is understood they were closed in 1987. After this time, it is understood that the site was used for landfill purposes, although the waste deposited at the site is understood to comprise excavation waste and uncontaminated earth.

A number of potentially significant historic industrial land uses have been recorded in the surrounding area. The Wheldale Collieries site actually extended to the north of Wheldon Road and a sewage works has been present to the north east of the site for a number of years (dating from the early 1900's). A gasometer was present just to the north of Wheldon Road in the late 1800's. Healdfield Brick Works was present to the south of the site and was later used as a landfill site (until 1994). Information from the Local Authority suggests that the landfill accepted various waste types, including household waste. It is understood that a venting trench was constructed adjacent to nearby properties to mitigate the migration of landfill gases.

2.2.3 Site Reconnaissance

Visual/Olfactory Evidence of Existing Contamination

All areas of the site have been subject to a visual inspection at the time of this application document and no

structural integrity/pollution pathways were identified.

The inspection was carried out in conjunction with the management of Clean Power for the purposes of inspecting and assessing the following:

- Physical condition of hardstanding;
- Condition and adequacy of containment bunds;
- Condition and adequacy of underground drainage and containment systems.

The site is currently derelict and comprises grass with a curved strip of trees and vegetation which starts along the northern boundary and runs south-west towards the south western corner of the site. A hardstanding curved path runs from north to south within the western section of the site and joins a rough track which runs parallel along the southern boundary.

The site covers an area of approximately 2.4 ha and is irregular in shape. Access to the site is via Wheldon Road. The topography of the Site is variable and generally slopes upwards in a southerly direction away from Wheldon Road. The ground level rises from approximately 15m AOD adjacent to Wheldon Road up to 21m AOD land adjacent to the railway line.

No evidence of current or historic Above Ground Storage Tanks (ASTs) or Underground Storage Tanks (USTs) were observed during the Site inspection.

No significant sources of potential pollution were identified during the visual inspection.

The following measures have been incorporated into the design of the new activity:

- All aspects of the site will be operated on sealed impermeable floor slabs which as a minimum will comprise of reinforced concrete which will be at least 200mm thickness. This concrete slab will provide a completely impermeable barrier to ensure that the underlying geology and controlled waters are protected.
- All storage tanks, process pipelines and equipment will be installed above ground.
- There will be no underground structures, pipelines or transfer ducts.
- All storage tanks will be equipped with secondary containment bunds that have been designed to comply with EA best practice guidelines as defined by PPG2 – Above Ground Storage Tanks.
- All storage tanks will be fitted with level gauges, alarms and hardwired into the plant online (SCADA) monitoring system.

The site will be operated in accordance to a strict maintenance schedule.

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

2.3 Evidence of Historic Contamination

Previous Site Investigation

No previous intrusive investigations have been carried out on site.

2.4 Supporting Information

Figures detailing the location, boundary and layouts of the Installation are shown in Annex A.

The Ground Conditions Baseline Phase 1 Study is reproduced in Annex B.

A Conceptual Model of the Site is shown in Annex C.

3. Permitted Activities

3.1 Permitted Activities Undertaken at the Installation

3.1.1 Existing Activities

The site is currently derelict.

Clean Power (UK) Ltd have made an application for a New Bespoke Installation Permit Application for the proposed operation of a waste to energy plant utilising Advanced Conversion Technologies (ACT) and a Biological Treatment Facility (using Anaerobic Digestion) at Wheldon Road, Castelford.

The site will incorporate ACT technologies using pyrolysis (a form of advanced conversion) and associated upstream processing and anaerobic digestion (an enclosed biological waste treatment process). This proposed development is a bespoke energy recovery centre that has been designed to recover all available resources from mixed solid waste feedstocks. The proposed development integrates the above technologies to provide a single treatment facility for solid wastes that would otherwise be destined for landfill or incineration.

3.1.2 Description of the New Process

The new activity will process and handle approximately 195,000 tonnes of used tyres per annum. A 8MWe Pyrolysis Advanced Conversion Technology (ACT) plant will recover and recycle approximately 128,000 tonnes per annum of Mixed Source Waste (MSW) and Commercial and Industrial Waste (C&I). A 2MWe AD facility will recover approximately 67,000 tonnes of per annum of green (pure biomass) waste.

Detailed description of the site processes are provided in the Application Support Document Ref: SOL1213CPP09_AB.

There are five key processes involved. A summary description of each of the processes is provided below:

- **Reception and Preparation:** All MSW wastes will be delivered into a waste reception building (operated under negative pressure). All mixed wastes are delivered into above ground waste reception hoppers and are inspected prior to loading into the autoclave processes. Pure biomass wastes and slurries will be delivered into the Anaerobic Digestion tanks.
- **Autoclaving:** Two autoclaves (with individual batch capacities of c. 20 tonnes) will be installed side by side for the treatment/sterilisation of all municipal mixed solid wastes. The autoclaves will break down all biomass materials into fibre flocculant through application of pressure and heat. All potential recyclates (plastic, metal, glass etc) will remain unchanged and pass through the autoclave unaffected.
- **Mechanical Separation:** The processed waste will be passed through a mechanical separation processing line which will systematically remove and segregate the individual waste streams. All recyclates (plastic, metal and glass) will be segregated and sent off site for recycling, all biomass fibre and flocculant materials will be passed forward for processing within the pyrolisers.
- **Pyrolysis:** The pyrolysis plant systems will pyrolyse the fibre material and convert it into a synthesis gas

('syngas'). The pyrolysis retorts are heated through the use of a charcoal burner system which utilises the char residues from the pyrolysis process as fuel. The synthesis gas will pass through a gas cleaning line and be stored in a gasometer prior to combustion.

- **Gas Treatment:** The gas treatment line comprises a wet or dry gas closed loop line for quenching the gas to ambient temperature. The gas will be scrubbed through a dedicated de-ionised water gas scrubbing/treatment line and then dried by passing through an air cooling plant. Biogas generated from the anaerobic digestion processes will be re-introduced at this stage.
- **Gas Engines:** There will be three gas engines each coupled to an electrical generation plant producing approximately 10MWe. These engines are designed to operate using syngas and will be providing electrical generation for the National Grid Network.

3.1.3 Substances Used at the Installation

Table 3.1: Materials Summary

Material	Nature of storage	Location	Fate
Gas Oil	Bunded oil tank < 10m^3 maximum storage Double skinned steel tanks stored internally and designed in accordance with EA PPG2 OST's.	Internal	100% combusted within pyrolyser burners during start-up and first hours of operation only.
Lubrication Oils	Bunded oil tank < 1m^3 Double skinned tanks stored internally and designed in accordance with EA PPG2 Oil Storage Tanks.	Internal	Used within Gas engines. All oils disposed off site
Ferric Oxide	Internal enclosed tank	Dedicated vessel within reception building	100% injected into AD reactor tanks, used for Hydrogen Sulphide removal
Biocides & Corrosion Inhibitor	Bunded plastic tanks < 1m^3	Internal	100% to process
Flocculants and Coagulants	Bunded plastic tanks < 1m^3	Internal	100% to process
Urea	Bunded storage tank or IBC's	Internal	100% injected into SCR abatement
Water	Mains supply and recovered rainwater storage tank (50% provided through greywater recycling)	Internal	100% to process

Waste

The autoclave process will generate a number of sterile recyclates, all of which will be transferred off site for recycling. Typically the recyclate will comprise ferrous and non ferrous metals (approximately 6% and 3% respectively), plastics and glass (approx 21% total yield).

The pyrolisation process will not inherently produce significant quantities of waste. With the exception of relatively small quantities of scrubber and maintenance wastes, the primary waste stream from the installation will be vitreous slag (melted charcoal ash) all of which will be reused off site as an aggregate material.

The vitreous slag has been tested in accordance with the Waste Acceptance Criteria, and is both non hazardous and inert. Therefore it is the intention to transfer this material off site for use as an aggregate material. Typically, vitrified slag will be approximately 8% of the total waste input into the pyrolyser.

All liquid digestate will be exported off site for use as land conditioning/fertilising agents.

Waste Storage

The design of the installation has taken into account the potential impacts on the environmental and neighboring receptors.

With the exception of local 'point of use' storage vessels, all waste will be stored within dedicated bays within the Reception Building.

All waste vessels, will be clearly identified, sealed and stored internally within a secured area protected by secondary containment.

All digestate will be stored within dedicated sealed tanks.

Water treatment

All process water used by the plant is recycled and recovered within the central water treatment and recovery plant.

The plant has been designed to recover all grey water as well as utilise all water from the building operations, internal drains and rain water.

The system has been designed such that all process and chemical tanks are located with secondary containment bunds, fitted with level gauges and alarms. The system will be fully automated and will operate continuously. The plant will be fully integrated into the SCADA control and PLC systems.

3.1.4 Drainage Systems

All surface water runoff arising from the operational areas of the site will be contained and discharged to holding tanks. All collected water will be sampled and discharged to foul sewer under consent.

All proposed waste processing areas within the Installation Boundary will be hard surfaced and impermeable.

An indicative drainage scheme for the Installation is provided within the main application document.

Hardstanding

All internal and external processing areas will be constructed with impermeable concrete hardstanding which will be designed in accordance to the load bearing requirements of the processing equipment and vehicles used at the facility. Typically, all non-structural concrete areas will comprise of a reinforced concrete hardstanding of at least

300mm thickness. All other load bearing elements will be significantly thicker as required and determined.

The access roads, delivery and service area and the area surrounding the AD tanks will be made of hardstanding.

Tanks and Bunds

There will be a number of tanks associated with the proposed development. All tanks will be installed with secondary containment and designed to comply with the Environment Agency Pollution Prevention Guidelines Note 2 '*Above Ground Oil Tanks'*. All storage and process tanks will be enclosed within the main process building.

3.1.5 Potential for Fugitive Releases to Soil, Groundwater and Surface Water

The materials and substances used in the new activity are not considered to have potential to cause ground or groundwater contamination under general storage or operating procedures.

Furthermore:

- There will be no drains within the building interior. Any materials spilt within the main building will be retained and treated accordingly. No materials will be able to leave the process area if spilled;
- All proposed tanks will be located away from vehicle maneuvering areas and within secondary containment bunds;
- All processing activities associated with operation are enclosed within the main building.

The site will operate a comprehensive maintenance and management system which is described in Section 3 of the main Application document.

The management system includes quarterly visual inspections of:

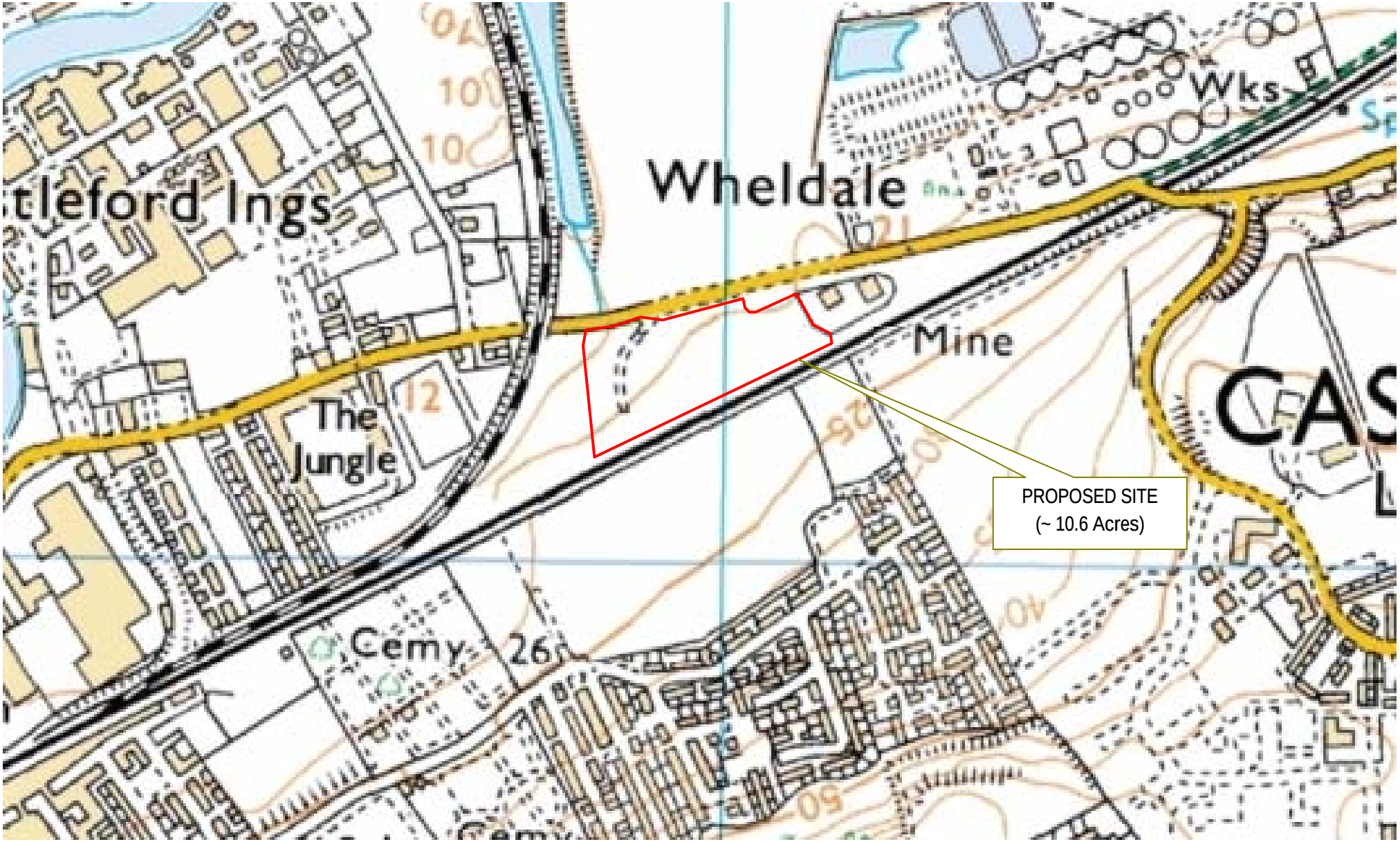
- all tanks and hard surfaced areas to detect any signs of deterioration, leaks or spillage. Any corrective action required is reported to and implemented by the Site Manager; and
- equipment in all process areas as part of the company's planned/predictive maintenance programme.

Site management will operate an environmental management system which is designed to meet the requirements of the Environmental Permitting Regulations, associated pollution prevention guidance.

Based on this, the potential for the new activity to impact on soil and groundwater underlying the installation is considered to be low.

Non-permitted activities undertaken at the Installation	Not applicable
Plan showing activity layout	Refer to Figure A1, Annex A
Environmental Risk Assessment	See attached Main Application Document SOL1213CPP09_AB.

Annex A – Figures



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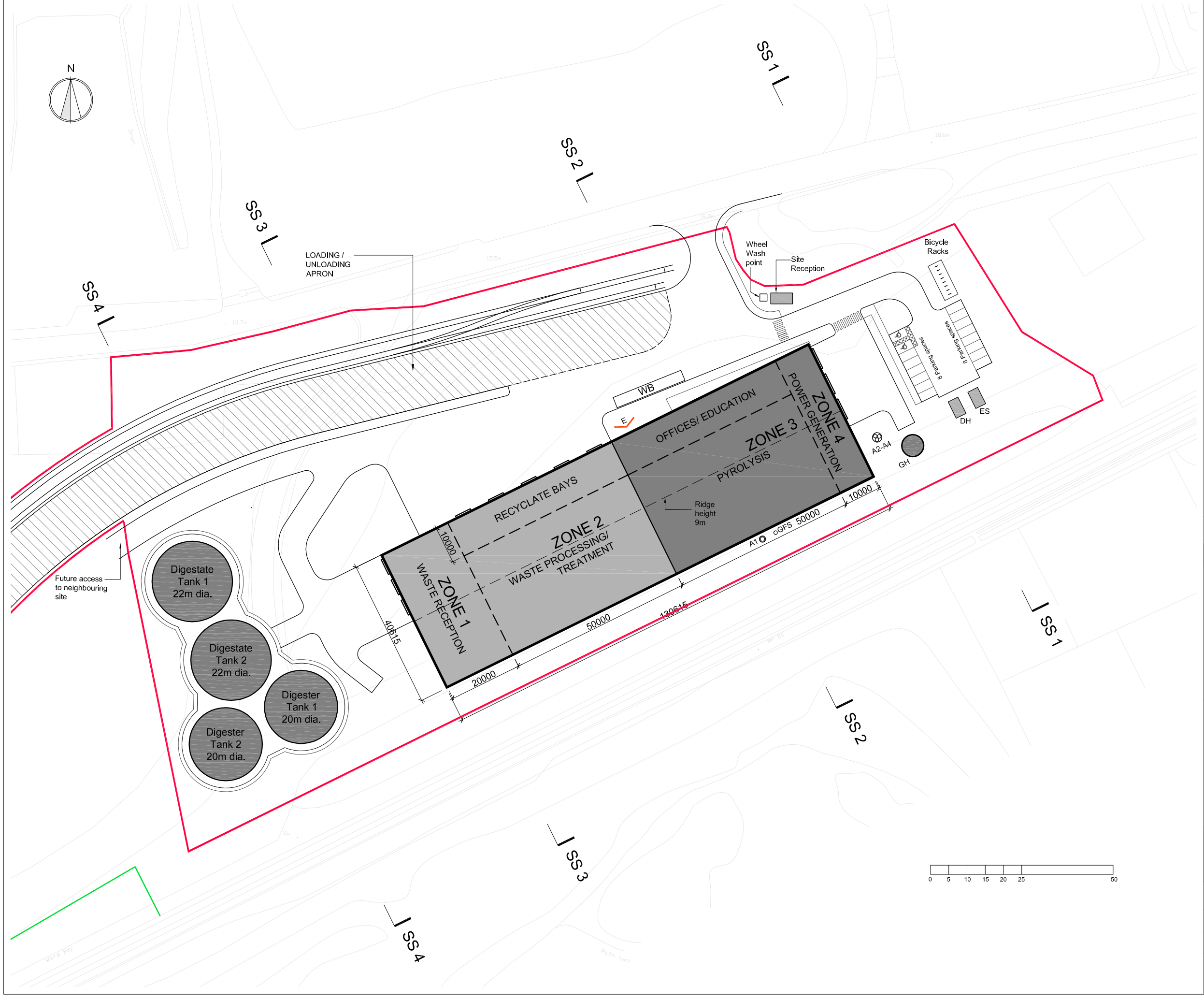
PROJECT TITLE: CLEAN POWER PROPERTIES LTD

DRAWING TITLE: ALLERTON BYWATER SITE LOCATION

DATE:	JANUARY 2012	SCALE:	NTS	STATUS:	ISSUED
DRAWN BY:	SMB	CHECKED BY:	HB	APPROVED:	SMB
DRAWING SIZE :	A4	DRAWING No:	FIGURE 1B	REV :	A

NOTES:

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



Notes:

1. Do not scale from this drawing.
2. All dimensions are in millimeters unless otherwise stated.
3. All dimensions must be checked on site.
4. The designers shall be notified of any discrepancies.
5. This drawing has been produced for sole use on this project and is not intended for use by any other person or any other purpose.

DRAWING NOTES:

1. This drawing represents the schematic Site Layout arrangement, and is subject to detail design development.
2. The building interior is to be kept under negative pressure to prevent odour impacts.
3. All waste reception & deliveries will be carried out within the building.
4. Roof lights are to maximise natural daylight within the building.
5. Indicative planting shown only.

LEGEND:

WW:	Wheel washing
WB:	Weigh Bridge
A1-A4:	Emission stacks
GFS:	Gas flare stack
GH:	Gas holder tank
ES:	Electrical Sub Station
DH:	District Heating connection
SS 1-3:	Site Section lines

New Trees

Rail Interface Area

E — Main Entrance

REV	DATE	REVISION DETAILS	BY
C	01.07.13	Boundary amended	
B	28.05.13	General amendments. Site name updated.	
A	16.01.13	Layout amended to include loading and unloading apron	
/	25.07.12	PLANNING APPLICATION ISSUE Previously drawing SK-001 Rev C	

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PROJECT TITLE
Advanced Conversion Technology & Anaerobic Digestion Facility, WHELDON ROAD, Castleford

DRAWING TITLE
Proposed Site Layout

CLIENT
Clean Power Properties Ltd & Network Rail Infrastructure Ltd

STATUS
PLANNING APPLICATION

SCALE	DRAWN
1:1000 AT A3	JW
CHECKED	APPROVED
RW	RW

DRG SIZE	DATE	DRAWING NUMBER	REV
A3	23.07.12	CPPL-05/10-01	C

Annex B – Ground Conditions Baseline Phase 1 Study

Pell Frischmann

excellence through innovation

WHELDON ACT AND AD FACILITY

ENVIRONMENTAL STATEMENT APPENDIX 10.1

GROUND CONDITIONS AND LAND CONTAMINATION

Ground Conditions Baseline Phase 1 Study

E57016/VBA/G001B

REVISION RECORD Report Ref:					
Rev	**Description**	**Date**	**Originator**	**Checked**	**Approved**
A	Draft	Mar 2012	A Clarke	A Cleeve	P Greatorex
B	Revised Issued	Aug 2012			
C	Revised Issue	Mar 2013		M Humphreys	

Prepared for:

Clean Power Properties Ltd &
Network Rail Infrastructure Ltd

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EXECUTIVE SUMMARY

Pell Frischmann was appointed by Clean Power Properties Ltd to undertake a Baseline Phase 1 Study for a proposed Advanced Conversion Technology and Anaerobic Digestion plant.

The Baseline Phase 1 Study was undertaken to provide an assessment of possible development constraints such as ground contamination and ground conditions. This report presents a preliminary assessment of potential ground contamination and foundation conditions and other relevant constraints that could impact development.

The historical mapping indicates that the site and the surrounding areas have been occupied by a number of potentially contaminative land uses. The site itself was once part of Wheldale Collieries and current and historical railway lines bound the site to the south and west respectively. Other nearby land uses include landfill sites, tips, chemical works and a brick works.

It is anticipated that the site will be underlain by Made Ground, which for the most part will be underlain directly by the Pennine Middle Coal Measure Formation. Some Alluvial deposits may exist above the solid deposits in the far north western corner of the site.

The nearest surface water body is the River Aire, located approximately 540m west of the site at its closest point. The underlying solid deposits (Middle Coal Measures) are designated as a Secondary A Aquifer, as are the alluvial deposits which may exist in a small portion of the site.

Immediately adjacent to the east of the site is The Wheldale Green Energy Park which is understood to 'capture' methane gas from the old mineworkings and convert these to energy.

Complete potential pollution linkages with a non-urgent medium risk rating have been identified at the site. The key risks relate to potential contamination and ground gases on impacting on future site users and construction workers of the proposed development. Further review, investigation and potential remediation may be required at the site.

Foundation design will require site specific parameters and therefore a ground investigation is recommended to obtain relevant data. Investigations for geotechnical and contamination purposes can be combined.

1. INTRODUCTION

1.1 TERMS OF REFERENCE

In November 2010, Pell Frischmann (PF) was commissioned by Clean Power Properties Ltd to undertake a baseline study of ground conditions as part of the Environmental Impact Assessment (EIA) for a proposed Advanced Conversion Technology and Anaerobic Digestion Plant on land known as Wheldon (hereafter referred to as 'the site') near Castleford, West Yorkshire. This report forms part of an appendix to the Environmental Statement (ES) in support of the planning application and is concerned with geotechnical and contaminated land aspects, particularly resulting from the historic industrial use and mining legacy of the site.

The site covers approximately 2.8 ha which forms part of a larger 4.8 ha site the majority of which is currently occupied by a grass, trees and a mixture of other overgrown vegetation and hardstanding concrete. It is known that various industrial uses took place at the site, mainly associated with the former Wheldale Colliery.

The proposed development is fully described in the ES and will include the construction of an Advanced Conversion Technology and Anaerobic Digestion plant. The ES supports an outline planning application for the site.

1.2 OBJECTIVES

The objectives of this investigation are to assess the ground conditions with respect to land contamination and historic mining to provide input to the ES in the identification and mitigation of potential environmental impacts. These are primarily the abnormal geotechnical conditions resulting from historic mining activities and the potential risks to human health and the aquatic ecosystem from land contamination.

1.3 SCOPE

The scope of work for this commission comprises the following:

- A desk study and site walk-over reconnaissance to determine the nature of the site and its surroundings including current and former land uses, geology, hydrogeology, hydrology and geo-environmental data. This includes a review of any previous investigations carried out at the site.

- Reporting on the findings of the desk study and initial geo-environmental assessment of the site conditions and an initial geotechnical interpretation of the ground and groundwater conditions in order to identify any potential hazards.

1.4 DATA SOURCES

In the production of this report, the following data sources have been utilised:

- Historic Ordnance Survey maps;
- Environment Agency Data;
- GroundSure Environmental Data Report prepared by eMapSite;
- GroundSure Geology Report prepared by eMapSite;
- British Geological Survey (BGS) maps;
- Consultation with the Assistant Scientific Officer at Wakefield Council reported in a letter dated 28th February 2012; and
- Coal Authority Report.

2. PHASE 1 STUDY

A number of desk study sources had been used to assemble the following information as listed above, including a proprietary environmental desk study report which has been obtained for the site. The environmental data report is the result of searches of a number of regularly updated authoritative databases and is presented as a series of tables and accompanying maps. Note that the boundary line may not be exactly the same as that shown on other drawings in this report and that the site area boundary shown in this report may not be the same the boundary red line for the planning application. Reference should be made to the Application Redline Plan submitted with planning application for the definitive boundary.

2.1 SITE REFERENCING

The site is situated off Wheldon Road to the east of Castleford town centre. The approximate centre of the site is located at National Grid Reference 443969, 426218. It is understood that the site is currently owned by Network Rail. A site location plan is contained within Appendix D an extract of which is presented below.

Figure 1: Site Location Plan

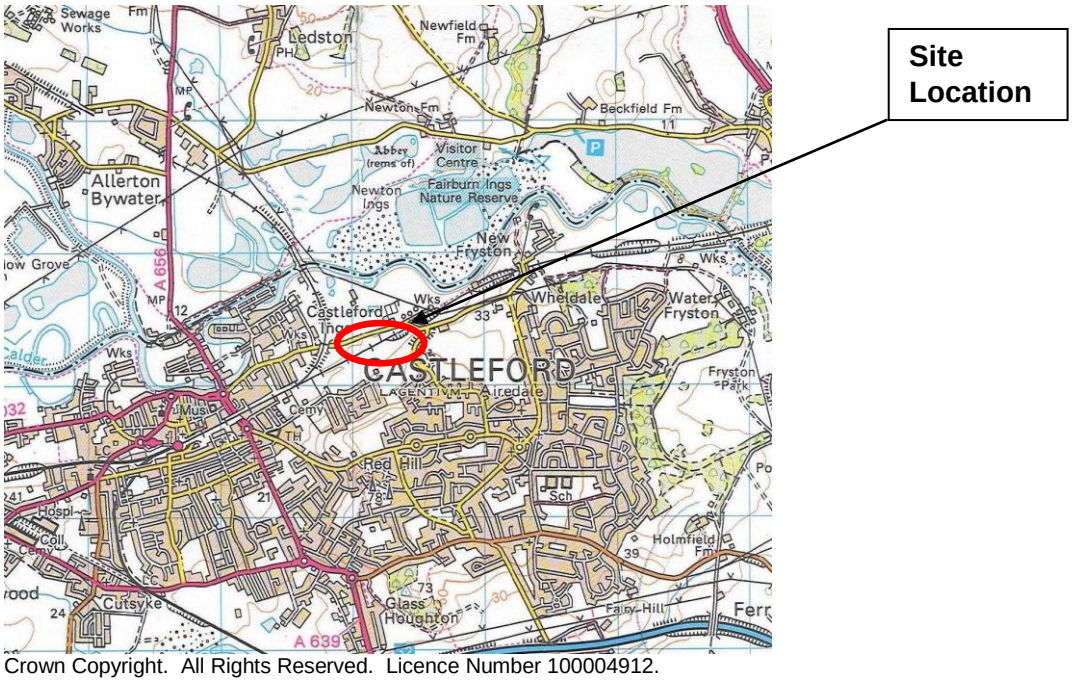
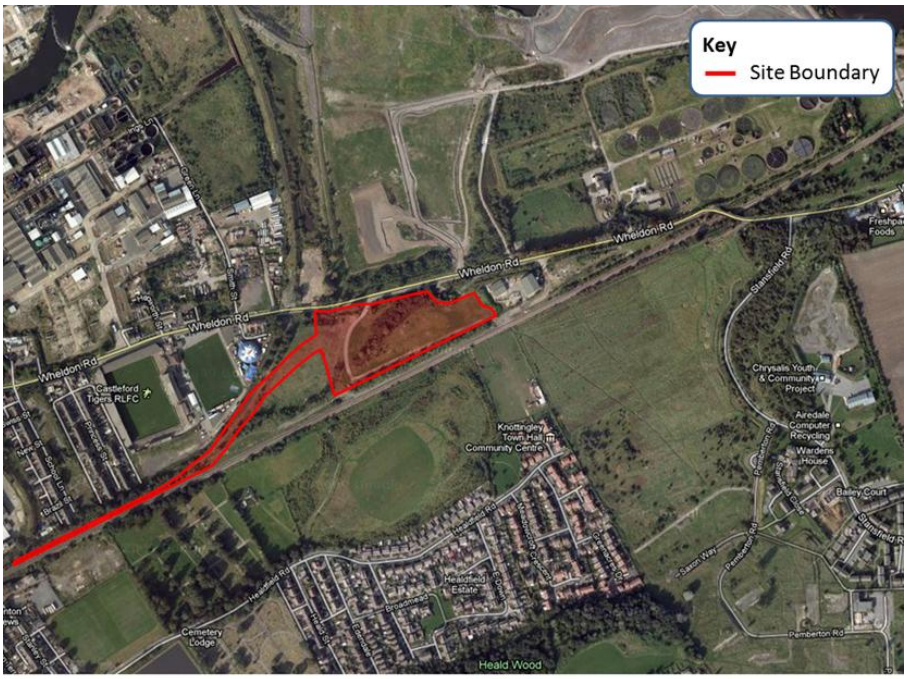


Figure 2: Aerial Photograph of site



Google Earth License Number JCPMB2ZBMMAWBHP

2.2 SITE DESCRIPTION

The site occupies a 2.4 ha irregular shaped area of land which is currently derelict and forms part of a larger 4.8ha brownfield site formerly occupied by part of the Wheldale Colliery. The site is currently occupied by grass with a curved strip of trees and vegetation which starts along the northern boundary and runs south west towards the south western corner of the site. A hard standing curved path runs from north to south within the western section of the site and joins a rough track which runs parallel along the southern boundary. Figure 2 presents an aerial photograph of the site.

The site is bound to the north by Wheldon Road, to the east by the Wheldale Green Energy Park, to the south by the railway line and to the east by a disused mineral railway line (on embankment).

It is understood that The Wheldale Green Energy Park captures Methane Gas from the former mineworkings underlying the study site. Surrounding land uses in the area include the Castleford Tigers Rugby Ground, located directly to the west of the disused railway line and some residential housing is also located on Wheldon Road, directly adjacent to the west of the site. An operational sewage works is located to the north east of the site.

2.3 SITE WALKOVER

A site walkover was undertaken on the 5th January 2012. Access to the site was directly available from Wheldon Road. Gates or fences were noted along all boundaries of the site, although gaps existed through which pedestrians could enter the site. Much fly tipping was noted across the site (particularly in close

proximity to Wheldon Road) and a gas monitoring standpipe was also noted in the north of the site.

An access road runs through the site runs from Wheldon Road towards the railway line.

The site slopes gently downwards from the southern boundary towards the north.

Site walk-over photographs are presented in Appendix B and show the current condition of the site.

2.4 LAND USE HISTORY

The historical land use of the site and the surrounding area has been established from superseded editions of Ordnance Survey maps which are presented in Appendix B. The findings are detailed in Table 1 (approximate distances are given from the site boundary).

It can be seen that the sites are located within an area with a heavily industrialised history, including many potentially contaminative historical land uses.

Table 1: Land Use History

Date	Description	Source
1890-1892	Wheldale collieries present on site. Railway infrastructure present in the west of the site with the colliery buildings in the east. The railway line extends over Wheldon Road. Stockpiles are annotated in the west of the site. Wheldon Road is present in its current alignment directly to the north of the site and the mineral railway is present directly to the west (Castleford and Pontefract Branch). A gasometer is present directly to the north of the site, over Wheldon Road. Castleford is developed to the west of the site with the nearest residential houses to the site directly to the west of the railway line and north of Wheldon Road.	1:2,500 & 1:10,560 scale.
1905-1908	Little significant change to the site itself. A shaft is now annotated within the colliery buildings directly to the east of the site boundary. Gasometer directly north of the site is no longer marked and a Sewage works (Castleford U.D Council) is now present directly to the north of Wheldon Road. Healdfield Brick works also present directly to the south of the railway line which forms the southern boundary of the site. Other industrial usage in close proximity includes a boiler works located approximately 200m to the north west of the site.	1:2,500 & 1:10,560 scale
1932-1938	Increase in number of railway lines and infrastructure within the colliery site. Increased railway infrastructure also present adjacent to the sewage works north of Wheldon Road. Tramway is also now present within the sewage works. A chimney is now annotated approximately 50m to the east of the site. Castleford Tigers football ground now located to the west	1:2,500 & 1:10,560 scale
1940-1952	No significant change to the site itself however a gantry now extends over Wheldon Road from the sewage works site to the north. An additional building is also present to the north of Wheldon Road.	1:10,560 & 1:2,500 scale.

Date	Description	Source
1961-1972	No significant change to the site itself or the surrounding area. Spoil heaps now annotated at the west of the site. By early 1970's the Healdfield Brick works is no longer shown and instead is shown as a refuse tip. Stated within the LA information that this site was utilised as a landfill site taking various wastes, including household until 1994.	1:10,560 & 1:2,500 scale.
1981-1985	No significant changes. Understood that the colliery closed in 1987.	1:10,000 & 1:1,200 scale.
1992-1995	Colliery is no longer annotated and the site appears to have been cleared with the exception of an access road into the site which still remains marked. All of the associated infrastructure to the north of wheldon road e.g. railway lines etc is also no longer marked. Information from the Local Authority states that the site itself was used as a landfill. This was a reclamation project that used inert excavation waste and uncontaminated earth in the 1990s	1:10,000
2002	No significant changes to the site or the surrounding area.	1:10,000
2011	No significant changes to the site or the surrounding area.	1:2,500

It can be seen that the site and the surrounding area have undergone significant development since the earliest available map (1890). Wheldale Collieries were present on site from the time of the earliest available mapping and it is understood they were closed in 1987. After this time, it is understood that the site was used for landfill purposes, although the waste deposited at the site is understood to comprise excavation waste and uncontaminated earth.

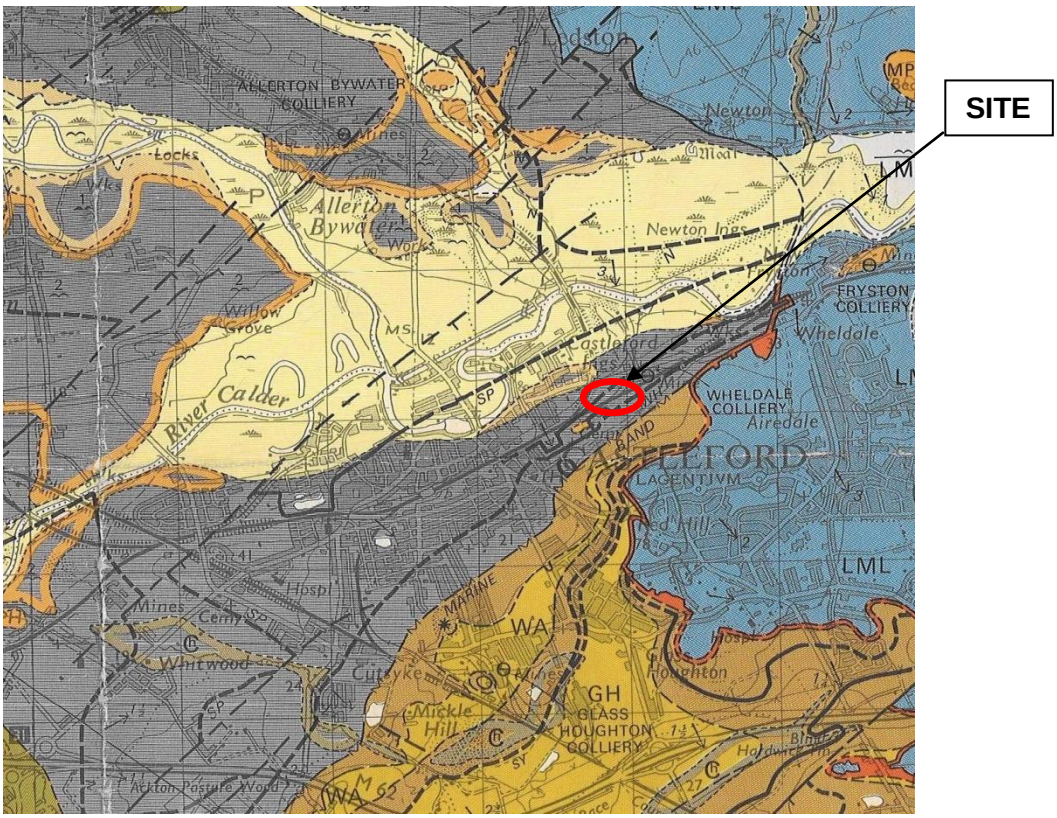
A number of potentially significant historic industrial land uses have been recorded in the surrounding area. The Wheldale Collieries site actually extended to the north of Wheldon Road and a sewage works has been present to the north east of the site for a number of years (dating from the early 1900's). A gasometer was present just to the north of Wheldon Road in the late 1800's. Healdfield Brick Works was present to the south of the site and was later used as a landfill site (until 1994). Information from the Local Authority suggests that the landfill accepted various waste types, including household waste. It is understood that a venting trench was constructed adjacent to nearby properties to mitigate the migration of landfill gases.

As noted during the site walkover, the site is bound to the east by the Wheldale Green Energy Park operated by Scottish and Southern Energy. It is understood that this plant 'captures' methane emissions from the old mineworkings and converts it into usable energy.

2.5 GEOLOGICAL SETTING

The published geology for the area (shown on 1:50,000 scale, sheet 78 Wakefield, Solid and Drift, 1978) an extract of which is illustrated in Figure 3, and included in Appendix D indicates that the majority of the site is likely to be directly underlain by mudstone, siltstone and sandstone of the Pennine Middle Coal Measures. The far northwest corner of the site is likely to be underlain by alluvial deposits comprising clay, silt, sand and gravel overlying the units of the Pennine Middle Coal Measures.

Figure 3: Geological Map Extracts



The GroundSure Report records the permeability of the superficial deposits on-site as very low to high through intergranular flow, which is assumed to relate to the areas where granular alluvium are present. The permeability of the Pennine Middle Coal Measures is recorded to be low to moderate.

A fault runs through the centre of the site from south west to north east (coal seam, inferred). Six further faults, also inferred as coal seams, are located within 500m of the site. Colliery waste tips are recorded in several locations on the site suggesting that Made Ground is likely to be present. Made Ground is also likely to be widespread across the site associated with the previous development present in variable depths and composition.

The site is not located within a radon affected area as less than 1% of the properties are above the action level for radon. Therefore radon protection measures are not required.

One borehole record has been obtained from the BGS GeoIndex relating to a borehole located within Wheldale Green Energy Park. This borehole was recorded to be 524m deep and is recorded within the index as a shaft drilled within the Wheldale Colliery. The borehole proves the succession of coal seams underlying the site. No record of when the borehole was drilled is given. The borehole record is presented in Appendix D.

2.6 GROUND INSTABILITY

The GroundSure Report records the risk from natural ground instability hazards at the site to be between negligible to very low, indicating that the site is unlikely to experience problems due to natural ground subsidence.

2.7 MINING

As would be anticipated by the historic presence of the Wheldale Colliery at the site, historical surface ground and underground workings associated with mining are recorded across the site. The historical surface ground workings are recorded as being either 'colliery' or 'refuse heap' related. Other historic mining related land uses are recorded within 250m of the site including unspecified quarries, brick works and clay pits.

The historic underground workings on site are recorded as collieries and an unspecified mine. Old shafts, mines and collieries are also all recorded within 1km of the site.

The only 'active' current ground working is recorded to be an abandoned mine (methane production) located approximately 22m to the south east of the site. This is thought to be related to the abstraction of methane by the Wheldale Green Energy Park.

Coal Authority Report

Reference to the Coal Authority's online gazetteer showed that Castleford is an area for which a coal report should be sought. Report number 00000782-12 was issued to PF on the 6th January 2012.

The salient points are detailed below:

- The property is within the likely influence of 6 coal seams at depths between 180m to 530m last worked in 1961;
- The property is not within the likely zone of influence of any present or proposed underground or surface workings;
- It is stated that there are no known coal entries on-site or within 20m of the boundary (although historical mapping suggests a shaft was located just beyond this, to the east of the site);
- The site does not lie within the influence of any past, present or future opencast mining workings; and
- There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property. However, the adjoining Wheldale Green Energy Park is known to 'capture' methane from the old coal workings and convert them to energy.

2.8 HYDROGEOLOGY

The environmental data report indicates that both the superficial (alluvial deposits) and solid deposits (Pennine Middle Coal Measures) underlying the site are classified as Secondary A Aquifers. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming and important base flow to rivers.

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

Eight licensed groundwater abstractions are recorded within 1km of the site. The nearest of these is located approximately 660m to the south west of the site and allows the abstraction of groundwater for general cooling and general usage

2.9 HYDROLOGY

The nearest surface water body is the River Aire which is located approximately 450m to the west of the site at its closest point.

The GroundSure Report has eight records of licensed surface water abstractions within 1km of the site. The nearest of these is located approximately 411m to the north of the site and relates to the usage of water for dust suppression.

The GroundSure report indicates that the northwest corner of the site is located within a Zone 2 floodplain. This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1-0.1%) in any year.

2.10 ENVIRONMENTAL DATA SEARCH

2.10.1 On-site

Environmental incidents, registers, abstraction licences or designated environmentally sensitive sites are not recorded on the site itself. However, a historical landfill site is noted to have existed on site. Information from both the GroundSure report and the Local Authority suggest that the site was the Wheldale Fryston Colliery reclamation site. This was a reclamation project which accepted inert excavation waste and uncontaminated earth in the 1990's. It is stated by the Local Authority that this should not give rise to any landfill gases.

2.10.2 Off-site

- Fourteen Environment Agency recorded pollution incidences are recorded within 250m of the site. Four entries are located approximately 39m to the north for specific waste materials such as asbestos, household waste and tyres. The impacts to water, air and land were categorised as no impact to minor impact.

- Various landfill sites have existed in close proximity to the site. From information given by the Local Authority, Hickson and Welsh operated two sites approximately 390m and 220m to the northwest of the site. The further

of the two sites operated from 1977 to 1993 and accepted black oxides of iron, tarry residues, building and general rubbish and incinerator ash. The nearer of the sites took unspecified chemical, domestic and commercial waste until 1993. The Smith Street site, 130m to the northwest accepted construction and excavation waste in the early 1990s. Healdfield quarry (former brickworks), directly to south of railway line took various wastes including household until 1994. A Venting trench has been constructed near properties to cut off migrating gas.

2.11 CURRENT LAND USE

The surrounding land use has been ascertained from a combination of sources including GroundSure data and Ordnance Survey mapping. Table 3 summarises the findings of the surrounding land use review and details of potentially significant contaminative land uses within 250m of the site from the Current Industrial Sites Data. Where entries are considered to relate to retailers they have not been included in Table 3 as they are not considered to represent potentially significant contaminative land uses.

There are 11 current industrial land uses recorded within 250m (one of which is a retail outlet and as such has not been included in Table 2 below).

Table 2: Surrounding Land Use

Direction	Land-use	Distance
South	Gas Governor/Gas Governor Station	250m
West	MT Specialist Cars (vehicle repair, testing, servicing)	95m
	Electricity sub station	210m
North West	Scrap Yard	127m
	Electricity Sub station	165m
	Depot	172m
	Wensley Transport/Kenneth Howley Transport Ltd- distribution and haulage	196m
South East	Electricity sub station	205m

No petrol/fuel sites or underground high pressure oil and gas pipelines have been recorded within 500m of the site.

2.12 CONSULTATIONS

Consultation has been undertaken with the Scientific Officer at Wakefield Council the findings of which have been reported in a letter dated 28th February 2012 (included as Appendix C). Relevant information regarding the historic use of the area is discussed below.

The site, in accordance with the Council's adopted strategy for Contaminated Land Inspection, would be subject of investigation within the meaning of Part IIA of the Environmental Protection Act 1990, on the basis of the following:

- The spreading of tipped material;
- The site is bounded to the south by existing railway land;
- The land to the west is occupied by a landfill gas engine generating plant;

- There is, and has been for a long time, a sewage works across the road to the north east of the site;
- There is a large historic, unremediated chemical works site to the north west;
- There are several scrap yards within the curtilage of the chemical works site; and
- There is a former brickworks site which has been land-filled to the south of the railway.

The Council stated that they are not aware of any complaints or prosecutions made against the site or surrounding properties except minor ones relating to fly tipping. In addition, they are not aware of any spillages or other incidents on site or in the surrounding area, but this would probably come under the jurisdiction of the Environment Agency.

2.13 SENSITIVE LAND USES AND DESIGNATED AREAS

No designated Environmentally Sensitive Sites have been recorded within 500m of the site.

2.14 PREVIOUS INVESTIGATIONS

Within the consultation information received from Wakefield Council, reference was made to a 2006 planning application for the former Wheldale Colliery site. A site investigation was presented as part of that planning application. Whilst part of that site investigation was undertaken on the site, no reliance can be made on that information and as such it has not been reproduced within this report.

3. PRELIMINARY RISK ASSESSMENT

The findings of the Baseline Phase 1 Study have been used to develop an outline conceptual site model comprising a ground model and an exposure model.

The ground model has been used to develop a preliminary list of geotechnical hazards such as poor foundation conditions, landslip, former mine workings and poor or aggressive ground conditions. It will give clarity, rationale and help communicate the required scope of intrusive investigation works for managing the identified geotechnical risks.

The exposure model has been used for geo-environmental hazard identification in line with the Model Procedures of CLR11. The scope is intended primarily to identify potential impacts to human health and construction materials from on-site contaminants, in order to establish suitability of use for the proposed development in terms of the planning control framework.

More generalised comments are included with respect to potential impacts to Controlled Waters and the wider ecosystem, in terms of the potential for land contamination to leach or flow into Controlled Waters. Note that a separate ES chapter is being written by others on the potential impacts to the water environment and that will have its own baseline study report.

3.1 LEGISLATIVE BACKGROUND

The primary legislative mechanism for contaminated land management in the UK is Part 2A of the Environmental Protection Act, 1990 (EPA). Part 2A was introduced into the EPA under Section 57 of the Environment Act 1995 to help deal with the substantial legacy of land contamination. Part 2A 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. Revised Part 2A Statutory Guidance was issued by the Secretary of State in April 2012.

The control of development and land use in the future is the responsibility of the planning system, which is the principal regulatory driver for this site. In March 2012, the Government released the National Planning Policy Framework (NPPF) which replaced all previous planning policy statements and guideline (PPS/PPG) documents including Planning Policy Statement (PPS) 23 Planning and Pollution Control. However, it should be noted that the NPPF does not change the statutory basis on which planning decisions are founded.

The NPPF emphasises the requirement for sustainable development. A fundamental principle of sustainable development is that the condition of land, its use and its development should be protected from potential hazards. The NPPF states that:

"*To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or*

proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Planning policies and decisions should also 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 2A of the Environmental Protection Act 1990; and*
- *Adequate site investigation information, prepared by a competent person, is presented.*"

It should be noted that some uncertainties exist due to the limited site-specific data available. However, potential contaminants and receptors have been identified based on the desk based assessment. Pathways have been established on reasonable scientific knowledge of the behaviour of the contaminants in the ground.

The guidance provided in CLR11 indicates the CSM should identify those contaminants, pathways and receptors which are 'likely' to represent an 'unacceptable' risk either to human health or the surrounding environment.

3.2 GEO-ENVIRONMENTAL HAZARD IDENTIFICATION

With reference to the Phase 1 Study reported above, Table 4 lists the possible contaminant sources, receptors and pathways identified, i.e. the possible pollution linkages (this constitutes the exposure model). The degree of risk associated with each of these linkages has been assessed by professional judgement in accordance with guidance in CIRIA Report C552 (Rudland *et al* 2001) but with the addition of a 'no linkage' category. The justification for the decision is recorded in the table.

Some linkages may be identified which constitute a theoretical connection between a source and a receptor, but professional judgement shows them not to be possible. These are labelled 'no linkage'. Those linkages deemed possible are assessed for their likely level of risk. The methodology is based on an assessment of the *probability* of a particular linkage existing (unlikely to high likelihood), multiplied by the level of *consequence* of the potential effects (minor to severe). Even those assessed as very low level of risk must be considered as possible in the first instance under the precautionary principle.

This gives an estimation of the perceived level of risk based on desk study and walk-over information. The level of risk is subdivided into 5 descriptive categories from very low to very high risk, plus no risk where there is no linkage (see Table 3).

Table 3: Geo-environmental Risk Rating

		Consequence			
Probability	*product*	**Severe**	**Medium**	**Mild**	**Minor**
	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Very low risk
	Low Likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Very low risk
	No Linkage	No risk			

Source	Possible Pathway	Receptor	Probability	Consequence	Risk Level	Comments
Inorganic and organic substances	Ingestion, inhalation or direct contact. Inhalation of fugitive dust. Root uptake. Leaching through unsaturated zone. Surface run-off, base flow from contaminated groundwater.	End users of the site. Neighbours. Protected ecosystem Ecosystems. Landscape planting. Groundwater and possible abstractors. Aquatic ecosystems. Surface water and possible abstractors	Likely	Medium	Moderate	Made Ground is present on site, no previous site investigation information available for the site area. Historic use of Made Ground during previous development of site and previous use of site as Wheldale Colliery may give rise to organic and inorganic chemicals present within the shallow soils on site. River Aire is 500m from the site, likely to be in hydraulic continuity with the groundwater underlying the site. The units underlying the site are classified as a Secondary A aquifer. Whilst not locally significant these may be of concern in local base flow and supply of rivers (i.e. Calder).
Sulphates present in the Made Ground and natural soils.	Direct contact with dissolved sulphates.	Buried concrete.	Low	Medium	Low	Made Ground is present on site, no previous site investigation information available for the site area. Historic use of Made Ground during previous development of site may give to sulphate bearing strata being on site. Natural ground not thought likely to contain sulphate bearing minerals.
Organic chemicals in the Made Ground	Direct contact or contact with vapours.	Plastic etc. building products (degradation).	Likely	Medium	Moderate	Made Ground is present on site, no previous site investigation information available for the site area. Historic use of Made Ground during previous development of site and previous use of site as a rail yard may give to organic chemicals being on site.
Asbestos fibres from insulation or asbestos-containing	Fugitive dust.	End Users of Site	Likely	Medium	Moderate	Made Ground likely to be present on site, Asbestos fibres may be present within Made Ground due to unknown sources. Site investigation may identify fibres within soils testing.

Source	Possible Pathway	Receptor	Probability	Consequence	Risk Level	Comments
materials in the Made Ground		Neighbours	Likely	Medium	Moderate	
Asbestos fibres from insulation or asbestos-containing materials in the buildings.	Fugitive dust.	End Users of Site	Likely	Medium	Moderate	Former buildings present on site that would require demolition prior to the construction of the Proposed Development.
		Neighbours	Likely	Medium	Moderate	
Elevated concentrations of ground gases (methane & carbon dioxide) from biodegradable matter in the Made Ground / mine workings.	Migration through soils or groundwater to indoor air.	End users of new buildings (asphyxiation or explosion).	Very Likely	Medium	High	No site investigation has been undertaken at the site as yet. Mine workings beneath the site are known to be actively
		Users of off-site properties (asphyxiation or explosion).	Very Likely	Medium	High	
		New buildings (damage by explosion).	Very Likely	Severe	Very High	
		Neighbouring properties (damage by explosion).	Very Likely	Severe	Very High	
Radon	Migration through soils or groundwater to indoor air.	End users of new buildings.	No linkage	No linkage	No linkage	BR 211 (2007) radon report indicates no precautions required.

Potentially complete pollutant linkages have been identified on the site; an overall non-urgent **Medium risk rating** has been assigned based on the proposed industrial development. The key potential pollution linkages and risk is summarised as:

- Contamination on site impacting on the human health of future site users and construction workers of the proposed development.
- Ground Gases from previous mining and landfilling activities.

This is a preliminary review, based on the assessment of available data presented in this report. Further investigation is required across the site to assess the presence of potential contamination sources on site. In addition, intrusive site investigation would be required to determine the geochemistry of the underlying ground and groundwater, and to provide data to enable quantitative risk assessment to be undertaken.

3.3 GEOTECHNICAL HAZARDS

From the geological survey maps, and historical workings maps, the following sequence of strata are anticipated: variable depths and compositions of Made Ground, possibly underlain in the far north western corner of the site by Alluvial deposits (Clay, Silt, Sand and Gravel), otherwise shallow bedrock comprising the Pennine Middle Coal Measures (Mudstone, Siltstone and Sandstone).

To minimise any risk to the scheme, it is recommended that geotechnical risk management be implemented as soon as possible following project inception to allow for the successful identification of potential hazards. This will allow for the initiation of successful and cost-effective control measures at the planning and preliminary design stage.

The Preliminary Risk Assessment below has highlighted limited potential geotechnical hazards that may adversely affect the proposed scheme if not identified at an early stage (Table 5). Successful identification will hopefully allow an efficient and well-structured phasing of the development and significantly minimise health and safety and geotechnical issues

Table 5: Preliminary Geotechnical Hazards – Risk Assessment

Hazard	Risk	Control Measures
Excavations	1. Side slope stability / groundwater ingress	1. Detailed Ground Investigation (GI) in order to determine soil parameters and groundwater regime and to design any permanent/temporary works. Choice of appropriate techniques.
Corrosive soils / groundwater *- Acidic/high sulphate-content*	1. Corrosion / chemical attack of buried concrete:	1. Chemical testing of groundwater and soil samples 2. Use of sulphate / acid resistant concrete
Ground conditions	1. It is anticipated that significant thickness of Made Ground deposits may be encountered across the site.	1. Detailed GI in order to design appropriate foundation design.

Hazard	Risk	Control Measures
Movement/Settlement of structures	1. Movement of structure due to presence of compressible made ground beneath foundations and/or change in ground conditions over time. 2. Bearing failure of low strength founding soil due to changes in loading, ground and/or groundwater conditions.	1. Detailed GI in order to design appropriate foundation design. 2. Choose foundations which bear beneath the soft deposits.
Uplift due to demolition and excavation	1. Detrimental effect on surrounding buildings	Design of suitable foundation solutions to keep movements within acceptable limits
Collapse due to presence of mine structures beneath the site / risk of significant damage to buildings / risk to site users.	Bearing failure due to collapse of mine structures beneath the site. Void Migration to surface.	Detailed GI / Risk Assessment to identify whether risks exist at site from presence of underground mine structures beneath the site.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

It is anticipated that the site will be underlain by a significant thickness of Made Ground, which in turn will be underlain by superficial deposits of alluvium (Clay, Silt, Sand and Gravel). At depth, the alluvium is likely to be underlain by a weathering profile of the Pennine Lower Coal Measures Formation.

Potential pollution linkages with a non-urgent medium risk rating have been identified at the site. The key risks relate to potential soil bound contamination and ground gases impacting on future site users and construction workers of the proposed development.

A number of potentially significant current and historic contaminative sources have been identified across the wider site; of particular significance are the former railway lines, several substations, tanks, and previous infilling and landfilling activities which were located within the site boundary. A railway line still exists along the eastern boundary of the site.

In terms of Controlled Waters, the site is considered to be in an area of moderate sensitivity with respect to groundwater resources due to the underlying Secondary A Aquifer which exists within both the superficial deposits and the bedrock. With respect to surface water resources, the site is considered to be located in low sensitivity setting given that the River Aire is located approximately 500m to the north of the site.

The available environmental database information suggests that the site has been subject to previous surface ground workings and areas may have been subject to large scale excavation. The historic plans suggest that parts of the site are likely to have been subjected to significant amounts of infilling associated with these previous excavations. In turn, this is likely to give rise to significant amounts of unknown Made Ground laid in an uncontrolled manner. Significant thicknesses of unknown Made Ground may give rise to ground instability issues.

The site is also known to have been the location of the former Wheldale Colliery, It is understood that there are significant amount of below ground workings in the area beneath and surrounding the site. It is thought that risks may exist to the proposed development from the presence of these below ground workings from potential collapse of these historic structures and subsequent void migration to the surface leading to risks of building stability and structural failure.

It is also understood that the adjacent site is abstracting methane from the below ground structures to use as an energy source. This would suggest that there is a potential risk from the presence of significant volumes of ground gas relating to the de-gassing of the coal measures beneath the site.

Soft ground associated with unconsolidated alluvium may also give rise to poor shallow founding conditions and other ground instability issues such as compressive settlement.

A strategy for dealing with these issues is discussed below.

4.2 RECOMMENDATIONS

4.2.1 Contamination

It is recommended that an intrusive investigation is undertaken, which should cover the entire site to outline the contaminative setting of the site.

4.2.2 Geotechnical

Foundation design will require site specific parameters and therefore a ground investigation is recommended to obtain relevant data. Within this investigation it is recommended that a risk assessment is undertaken in order to ascertain whether any risks exist at the site from the presence of the historic below ground structures associated with the former Wheldale colliery. This risk assessment may include intrusive surveys to assess for the presence of adits beneath the proposed structure.

Investigations for geotechnical and contamination purposes can be combined.

5. LIMITATIONS AND UNCERTAINTIES

This report has been prepared by Pell Frischmann with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client.

The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true representative data with respect to site conditions. The information reported herein is based on the interpretation of data collected during the desk based study.

Should additional information become available that may influence the opinions expressed in this report, Pell Frischmann reserves the right to review such information and, if warranted, to alter the opinions accordingly.

The evaluation and conclusions do not preclude the existence of other site conditions and contaminants, which could not reasonably have been revealed by the desk study works undertaken at the time of writing. This report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site conditions or potential waste streams.

This report has been prepared solely for the use of the client, and may not be relied upon by other parties without written consent from Pell Frischmann.

Pell Frischmann disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

APPENDIX A

GroundSure Report

EmapSite
Masdar House,
Eversley, RG27 0RP

Report Reference:	EMS-149284_215261
Your Reference:	EMS_149284_215261
Report Date	Jan 6, 2012
Report Delivery Method:	Email - pdf

GroundSure GeoInsight

Address: Allerton Bywater

Dear Sir/Madam,

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

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

Yours faithfully,

emapsite customer services team

Enc.
GroundSure GeoInsight

GroundSure GeoInsight

Address: Allerton Bywater

Date: Jan 6, 2012

Report Reference: EMS-149284_215261

Your Reference: EMS_149284_215261

Brought to you by emapsite

Aerial Photograph of Study Site

NW N NE

W E

SW S SE

Site Name: Allerton Bywater
Grid Reference: 443969,426218
Size of Site: 2.74 ha

Overview of Findings

The GroundSure GeoInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and GroundSure's unique database including historical surface ground and underground workings.

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

Report Section	Number of records found within (X) m of the study site boundary
1. Geology	**Description**
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site?*	Yes
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	Yes
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	Yes
1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
1.3.2 Are there any records relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.3.4 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
1.3.5 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site

Source:Scale 1:50,000 BGS Sheet No:078

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	13	10	42	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	7	0	0	6	3
2.3 Current Ground Workings	0	2	1	11	8

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	7	0	0	6	3
3.2 Coal Mining	1	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining*	0	0	1	4	4
3.5 Non–Coal Mining Cavities	0	0	0	0	2
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

*This includes an automatically generated 50m buffer zone around the site

4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Very Low	-	-	-	-
4.2 Landslides	Very Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Negligible	-	-	-	-
4.4 Compressible Deposits	Moderate	-	-	-	-
4.5 Collapsible Deposits	Very Low	-	-	-	-
4.6 Running Sand	Very Low	-	-	-	-

* This includes an automatically generated 50m buffer zone around the site

5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	0	1	5	-	-

6. Estimated Background Soil Chemistry	on-site	0-50	51-250	251-500	501-1000
6.1 Records of Background Soil Chemistry	3	0	0	-	-

1.1 Artificial Ground Map

NW N NE

W E

SW S SE

Artificial Ground Legend

Enabled by Ordnance Survey

Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:078

1.1.1 Artificial/Made Ground

Are there any records of Artificial/Made Ground within 500m of the study site boundary? **Yes**

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	41.0	S	WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT
3	406.0	SW	WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT
4	432.0	SW	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
5	449.0	SW	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
6	450.0	SW	WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT

1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site* boundary? Yes

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	Very Low
41.0	S	Intergranular	Very High	Very Low

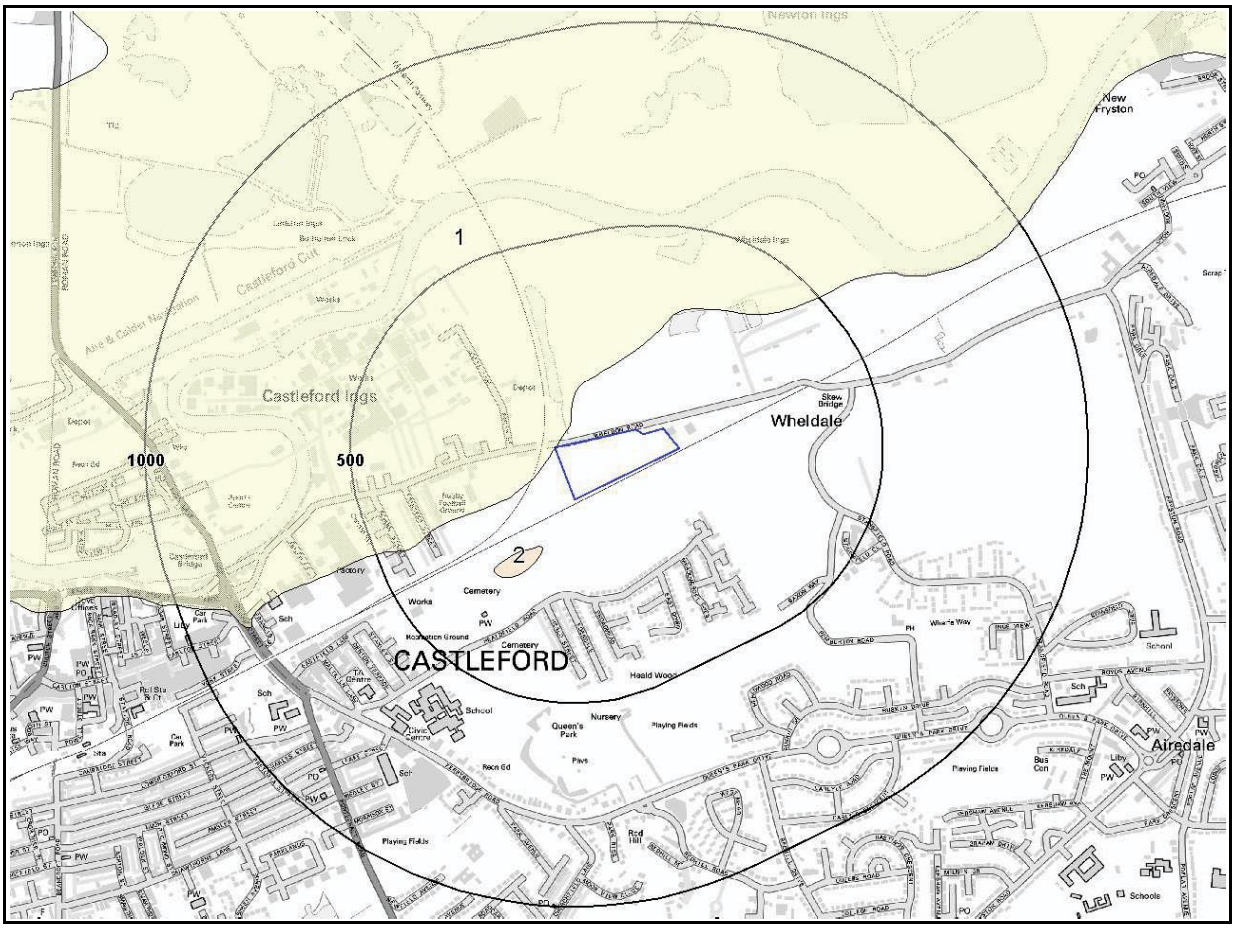
* This includes an automatically generated 50m buffer zone around the site.

1.2 Superficial Deposits and Landslips Map

NW N NE

W E

SW S SE



Superficial and Landslips Legend

Site Outline

500
1000
Search Buffers (m)

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

1.2Superficial Deposits and Landslips

1.2.1 Superficial Deposits/Drift Geology

Are there any records of Superficial Deposits/Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	Lex Code	Description	Rock Description
1	0.0	On Site	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	141.0	SW	RTDU-SAGR	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND AND GRAVEL

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site* boundary? Yes

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	High	Very Low

1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary? No

Database searched and no data found.

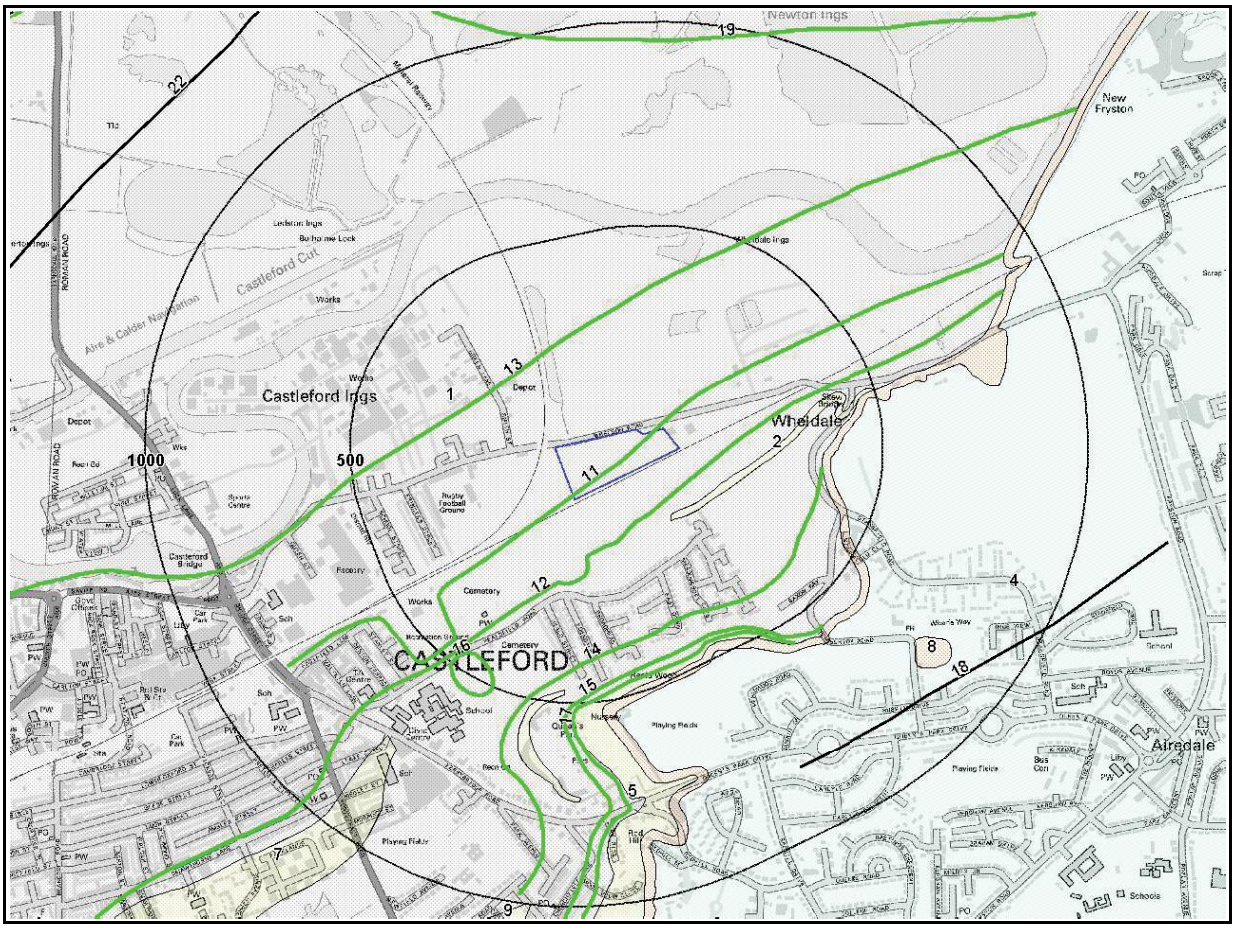
*This includes an automatically generated 50m buffer zone around the site.

1.3 Bedrock and Faults Map

NW N NE

W E

SW S SE



Bedrock & Faults Deposits Legend

Site Outline

500
1000
Search Buffers (m)

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

1.3Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:078

1.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	PMCM-MDSS	Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
2	131.0	SE	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)
3	350.0	E	YWS-SDST	Yellow Sands Formation - Sandstone	Early Permian
4	369.0	E	CDF-DOLO	Cadeby Formation - Dolostone	Late Permian
5	456.0	SE	GH-SDST	Glass Houghton Rock - Sandstone	Bolsovian (westphalian C)
6	468.0	S	PMCM-SDST	Pennine Middle Coal Measures Formation - Sandstone	Bolsovian (westphalian C) / Duckmantian (westphalian B)

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary? Yes

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Moderate	Low

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	Category Description	Feature Description
11	0.0	On Site	ROCK	Coal seam, inferred
12	76.0	SE	ROCK	Coal seam, inferred
13	204.0	NW	ROCK	Coal seam, inferred
14	352.0	E	ROCK	Coal seam, inferred
15	442.0	SE	ROCK	Coal seam, inferred
16	450.0	SW	ROCK	Coal seam, inferred
17	456.0	SE	ROCK	Coal seam, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3.4 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

* This includes an automatically generated 50m buffer zone around the site.

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level

1.3.5 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?

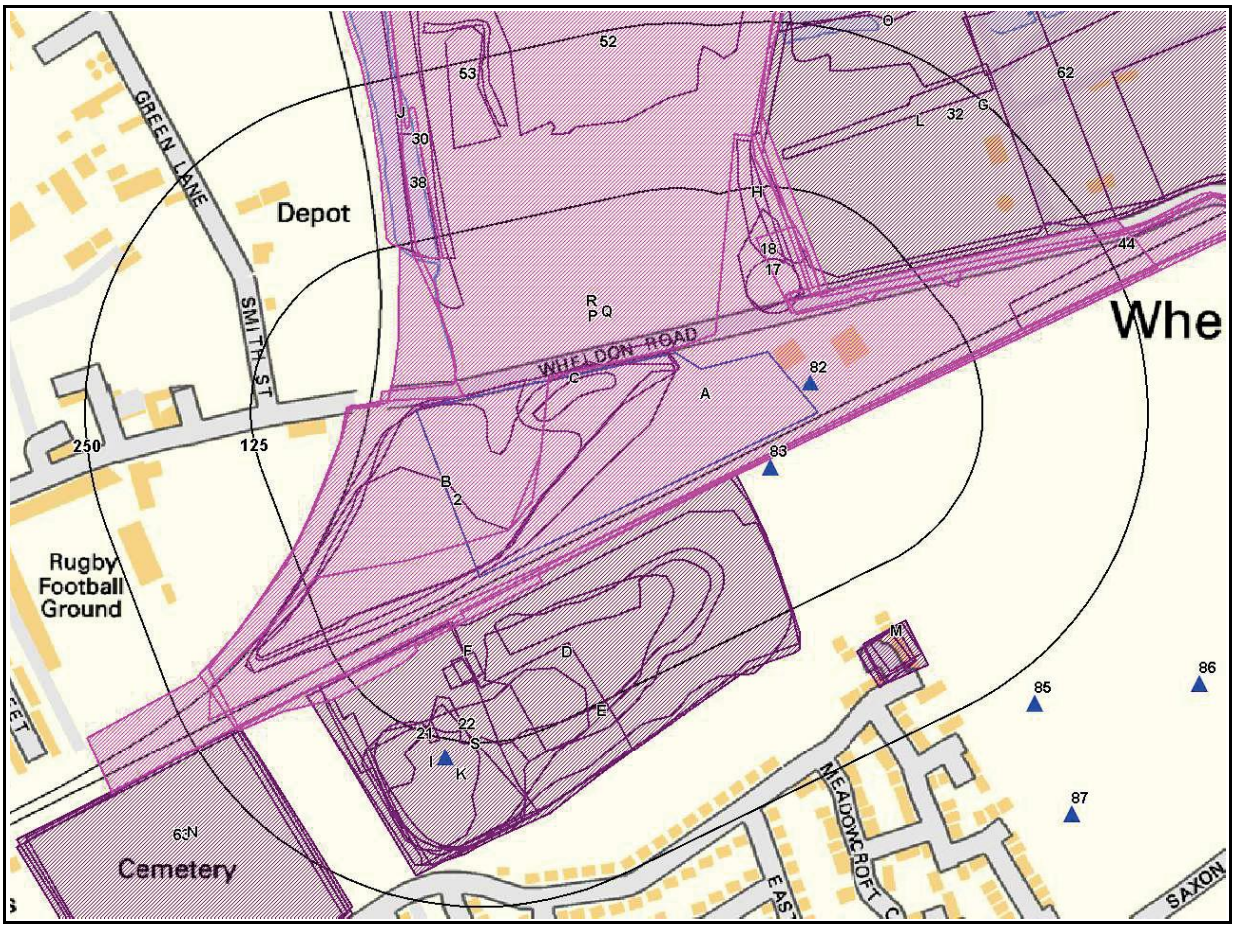
No radon protective measures are necessary

2. Ground Workings Map

NW N NE

W E

SW S SE



Ground Workings Legend

Site Outline

125
250
Search Buffers (m)

Historic Surface Ground Workings

Historic Underground Workings

Current Ground Workings

2. Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1R	0.0	On Site	443958,426403	Colliery	1981
2	0.0	On Site	443868,426166	Refuse Heap	1905
3B	0.0	On Site	443867,426162	Refuse Heaps	1938
4A	0.0	On Site	444035,426231	Collieries	1938
5A	0.0	On Site	444035,426231	Collieries	1890
6A	0.0	On Site	444035,426231	Collieries	1905
7B	0.0	On Site	443835,426162	Refuse Heap	1968
8B	0.0	On Site	443835,426162	Refuse Heap	1950
9P	0.0	On Site	444031,426396	Collieries	1940
10 C	0.0	On Site	443952,426254	Refuse Heap	1950
11 Q	0.0	On Site	443973,426433	Collieries	1950
12 B	0.0	On Site	443872,426176	Refuse Heap	1940
13 C	0.0	On Site	443952,426254	Refuse Heap	1968
14 D	12.0	SE	443941,426048	Brick Works	1940
15 D	16.0	SE	443947,426046	Brick Works	1950
16 D	24.0	SE	443938,426039	Refuse Heap	1981
17	29.0	N	444102,426338	Refuse Heap	1905
18	31.0	N	444101,426359	Refuse Heap	1890
19 E	35.0	SE	443989,426024	Unspecified Quarry	1968
20 E	35.0	SE	443989,426024	Unspecified Quarry	1950
21	39.0	SW	443838,425987	Brick Works	1905
22	42.0	SW	443873,425991	Brick Works	1938
23 D	43.0	S	443956,426052	Clay Pit	1940
24 L	55.0	NE	444226,426459	Sewage Works	1905
25 F	56.0	S	443872,426049	Reservoir	1940
26 F	63.0	S	443865,426044	Reservoir	1938
27 G	63.0	NE	444373,426500	Sewage Works	1995
28 G	63.0	NE	444373,426500	Sewage Works	1981
29 H	65.0	N	444093,426402	Refuse Heap	1938
30	69.0	N	443822,426569	Refuse Heap	1940
31 H	70.0	N	444107,426406	Refuse Heap	1940
32	72.0	NE	444323,426473	Sewage Works	1938
33 S	78.0	SE	443878,425977	Unspecified Pit	1938
34I	94.0	S	443838,425968	Unspecified Pit	1905
35I	101.0	S	443859,425966	Unspecified Pit	1940
36J	107.0	N	443805,426515	Pond	1981
37J	107.0	N	443805,426515	Pond	1995
38	108.0	N	443835,426407	Pond	1968
39J	108.0	N	443812,426520	Pond	1950

40 K	117.0	S	443865,425957	Pond	1968
41 K	117.0	S	443865,425957	Pond	1950
42 L	147.0	N	444189,426469	Sludge Bed	1981
43 L	147.0	N	444189,426469	Sludge Bed	1995
44	167.0	NE	444369,426356	Cuttings	1950
45 M	171.0	SE	444195,426064	Reservoir	1940
46 M	171.0	SE	444196,426060	Reservoir	1968
47 M	171.0	SE	444196,426060	Reservoir	1950
48 M	171.0	SE	444196,426060	Reservoir	1981
49 M	172.0	SE	444191,426060	Pond	1890
50 M	174.0	SE	444188,426055	Reservoir	1938
51 M	174.0	SE	444188,426055	Reservoir	1905
52	180.0	N	443979,426569	Pond	1905
53	188.0	N	443876,426489	Pond	1938
54	196.0	N	443885,426500	Unspecified Ground Workings	1940
55 N	213.0	SW	443661,425888	Cemetery	1940
56 N	215.0	SW	443661,425884	Cemetery	1968
57 N	215.0	SW	443661,425884	Cemetery	1950
58 N	217.0	SW	443656,425885	Cemetery	1981
59 N	217.0	SW	443656,425885	Cemetery	1995
60 O	218.0	N	444306,426568	Sludge Beds	1968
61 O	218.0	N	444306,426568	Sludge Beds	1950
62	218.0	N	444375,426519	Sewage Works	1950
63	222.0	SW	443709,425814	Cemetery	1938
64	231.0	N	444116,426603	Refuse Heap	1940
65	242.0	N	444150,426555	Pond	1890

2.2 Historical Underground Workings Features derived from Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
66A	0.0	On Site	444035,426231	Collieries	1938
67A	0.0	On Site	444035,426231	Collieries	1905
68P	0.0	On Site	444031,426396	Collieries	1940
69Q	0.0	On Site	443973,426433	Unspecified Mine	1968
70Q	0.0	On Site	443973,426433	Collieries	1950
71A	0.0	On Site	444035,426231	Collieries	1890
72R	0.0	On Site	443958,426403	Colliery	1981
Not shown	410.0	SE	444202,425813	Unspecified Old Shaft	1905

Not shown	434.0	SE	444126,425749	Unspecified Old Shaft	1940
Not shown	439.0	SE	444119,425742	Unspecified Old Shaft	1938
Not shown	439.0	SE	444119,425742	Unspecified Old Shaft	1905
Not shown	442.0	SE	444129,425743	Unspecified Old Shaft	1950
Not shown	496.0	S	444053,425647	Unspecified Old Shaft	1905
Not shown	955.0	NW	441805,427546	Collieries	1950
Not shown	976.0	NE	445907,427053	Unspecified Mine	1967
Not shown	976.0	NE	445907,427053	Colliery	1982

2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? **Yes**

The following Current Ground Workings information is provided by British Geological Society:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
82	10.0	NE	444130, 426265	Coal, Deep	Wheldale Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun' Ee' - Scots)	Ceased
83	22.0	SE	444100, 426200	Abandoned Mine Methane	Wheldale Colliery Methane	Wellsite, or other surface plant, extracting liquid or gas. Working may be for brine, oil or natural gas	Active
84S	139.0	S	443855, 425980	Clay & Shale	Healdfield Brickworks	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
85	275.0	SE	444300, 426021	Coal, Deep	Wheldale Coal Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
86	354.0	SE	444424, 426036	Coal, Deep	Wheldale Coal Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
87	360.0	SE	444328, 425937	Coal, Deep	Wheldale Coal Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	393.0	E	444521, 426165	Coal, Deep	Wheldale Ings Coal Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun' Ee' - Scots)	Ceased
Not shown	405.0	SE	444200, 425822	Coal, Deep	Heald Wood Coal Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	409.0	E	444540, 426305	Sand & Gravel	Wheldale Ings	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

Not shown	414.0	E	444535, 426133	Dolomite	Wheldale Ings	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	430.0	SE	444526, 426062	Coal, Deep	Wheldale Coal Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	438.0	SE	444118, 425745	Coal, Deep	Heald Wood Coal Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	475.0	SW	443510, 425820	Clay & Shale	Castleford Cemetry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	496.0	S	444048, 425650	Coal, Deep	Heald Wood	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	629.0	E	444739, 426421	Sandstone	Wheldale	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	635.0	SE	444169, 425551	Coal, Deep	Wheldale Coal Pits	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun' Ee' - Scots)	Ceased
Not shown	703.0	S	443735, 425429	Clay & Shale	Red Hill	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	770.0	E	444890, 426400	Silica Sand	Wheldale Sand Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun' Ee' - Scots)	Ceased
Not shown	780.0	E	444880, 426475	Silica Sand	Wheldale Sand Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	791.0	SE	444257, 425420	Coal, Deep	Wheldale Coal Pits	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun' Ee' - Scots)	Ceased
Not shown	964.0	S	444060, 425170	Sand	Redhill Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	998.0	S	444085, 425140	Coal, Deep	Houghton Coal Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun' Ee' - Scots)	Ceased

3. Mining, Extraction & Natural Cavities Map

NW N NE

W E

SW S SE

Mining, Extraction & Natural Cavities Legend

Enabled by Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Historical Mining

Non-Coal Mining Cavities

Natural Cavities

Non-Coal Mining

Highly likely

Likely

Unlikely

Highly unlikely

Rare

3.Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from GroundSure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? **Yes**

The following Historical Mining information is provided by Groundsure :

ID	Distance (m)	Direction	NGR	Details	Date
12	0.0	On Site	443958,426403	Colliery	1981
13B	0.0	On Site	444035,426231	Collieries	1938
14A	0.0	On Site	443973,426433	Unspecified Mine	1968
15A	0.0	On Site	443973,426433	Collieries	1950
16B	0.0	On Site	444035,426231	Collieries	1890
17B	0.0	On Site	444035,426231	Collieries	1905
18	0.0	On Site	444031,426396	Collieries	1940
19	410.0	SE	444202,425813	Unspecified Old Shaft	1905
20C	434.0	SE	444126,425749	Unspecified Old Shaft	1940
21C	439.0	SE	444119,425742	Unspecified Old Shaft	1938
22C	439.0	SE	444119,425742	Unspecified Old Shaft	1905
23C	442.0	SE	444129,425743	Unspecified Old Shaft	1950
24	496.0	S	444053,425647	Unspecified Old Shaft	1905
Not shown	955.0	NW	441805,427546	Collieries	1950
Not shown	976.0	NE	445907,427053	Unspecified Mine	1967
Not shown	976.0	NE	445907,427053	Colliery	1982

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? **Yes**

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? **No**

The following information provided by JPB is not represented on Mapping:

Database searched. No results found.

3.4 Non – Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? **Yes**

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	169.0	E	Not available	Sand	Likely - Underground mining known or suspected within or close to the area.
2	334.0	E	Not available	Sand	Highly likely - Underground mining known within or very close to the area.
3	350.0	E	Not available	Sand	Unlikely - Some small scale mining may have occurred but restricted in extent.
4	350.0	E	Not available	Vein Mineral/Sandstone	Likely - Underground mining known or suspected within or close to the area.
5	380.0	E	Not available	Vein Mineral/Sandstone	Likely - Underground mining known or suspected within or close to the area.
Not shown	684.0	S	Not available	Sand	Likely - Underground mining known or suspected within or close to the area.
Not shown	738.0	S	Not available	Sandstone	Likely - Underground mining known or suspected within or close to the area.
Not shown	740.0	S	Not available	Vein Mineral/Sandstone	Likely - Underground mining known or suspected within or close to the area.
Not shown	876.0	E	Not available	Sand	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.

3.5 Non – Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? **Yes**

The following Non-Coal Mining Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Address	Superficial Deposits	Bedrock Deposits	Extracted Mineral
Not shown	780.0	E	444900, 426400	Wheldale Sand Mine, West Yorkshire	-	-	Firestone, Freestone, Hearthstone, Honestone, Ragstone, Sandstone, Scythestone, Silver Sand, Whetstone
Not shown	943.0	S	444100, 425200	Noted By Edwards, Sand Workings, West Yorkshire	-	-	Firestone, Freestone, Hearthstone, Honestone, Ragstone, Sandstone, Scythestone, Silver Sand, Whetstone

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? **No**

Database searched and no data found.

3.7 Brine Extraction

This dataset provides information from the Brine Compensation Board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary? **No**

Database searched and no data found.

3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? **No**

Database searched and no data found.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level. More detailed information on potential Tin Mining may be found in Section 3.4 – Non-Coal Mining Hazards.

Are there any Tin Mining areas within 1000m of the study site boundary? **No**

Database searched and no data found.

3.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? **No**

Database searched and no data found.

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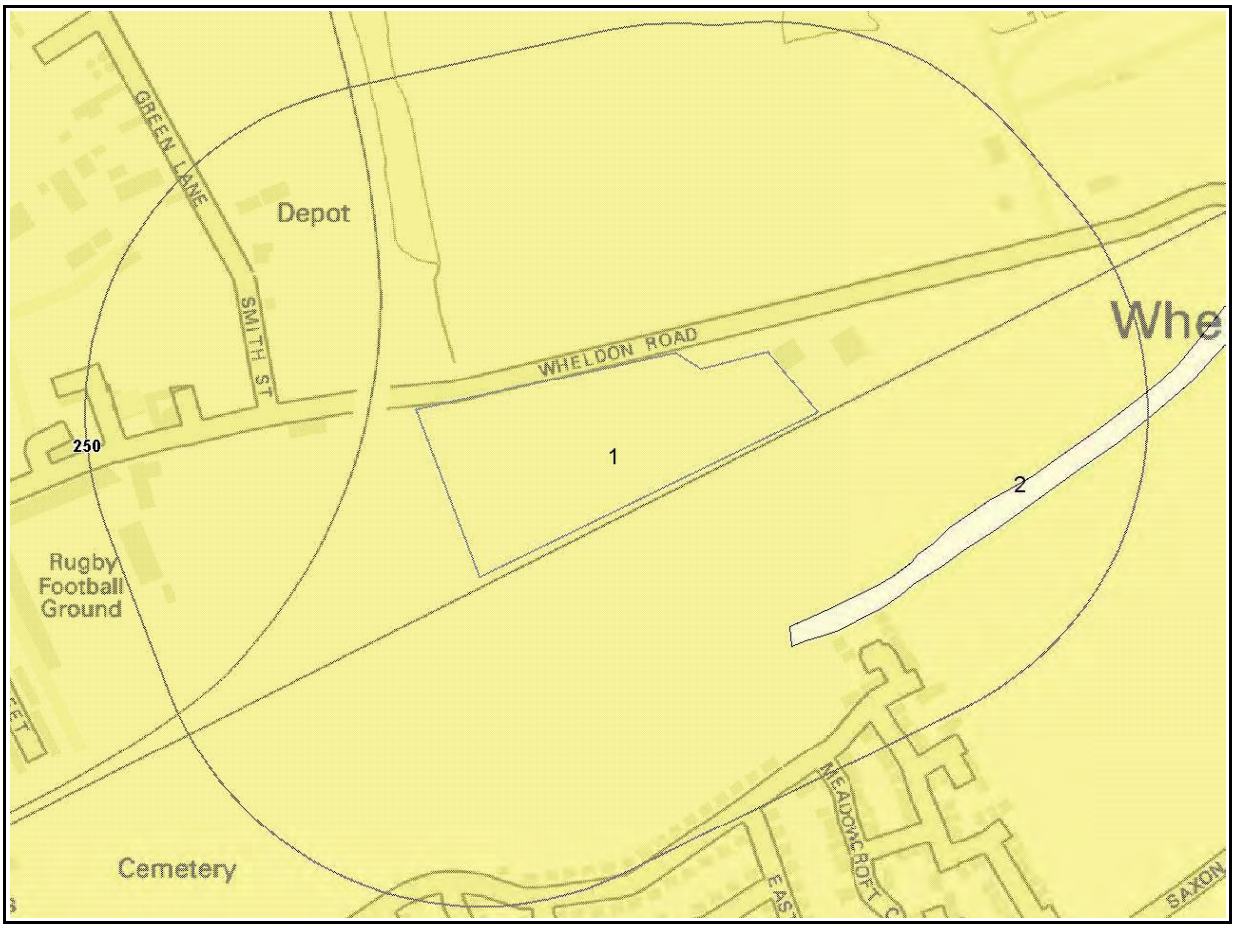
4. Natural Ground Subsidence
4.1 Shrink-Swell Clay Map

NW N NE



W E

SW S SE

Shrink-Swell Clay Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

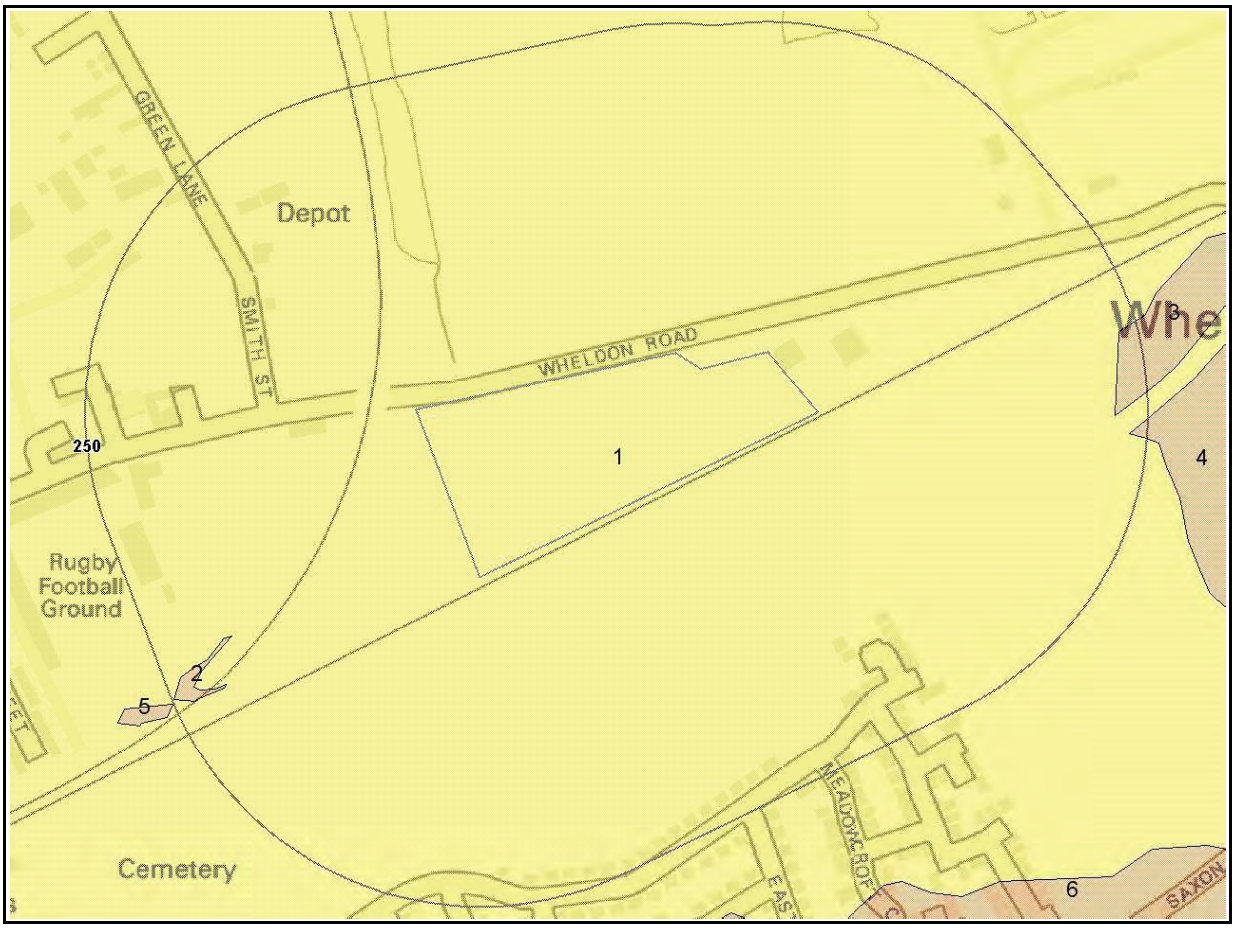
Low
Moderate
High

4.2 Landslides Map

NW N NE

W E

SW S SE



Landslides Legend

Enabled by Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

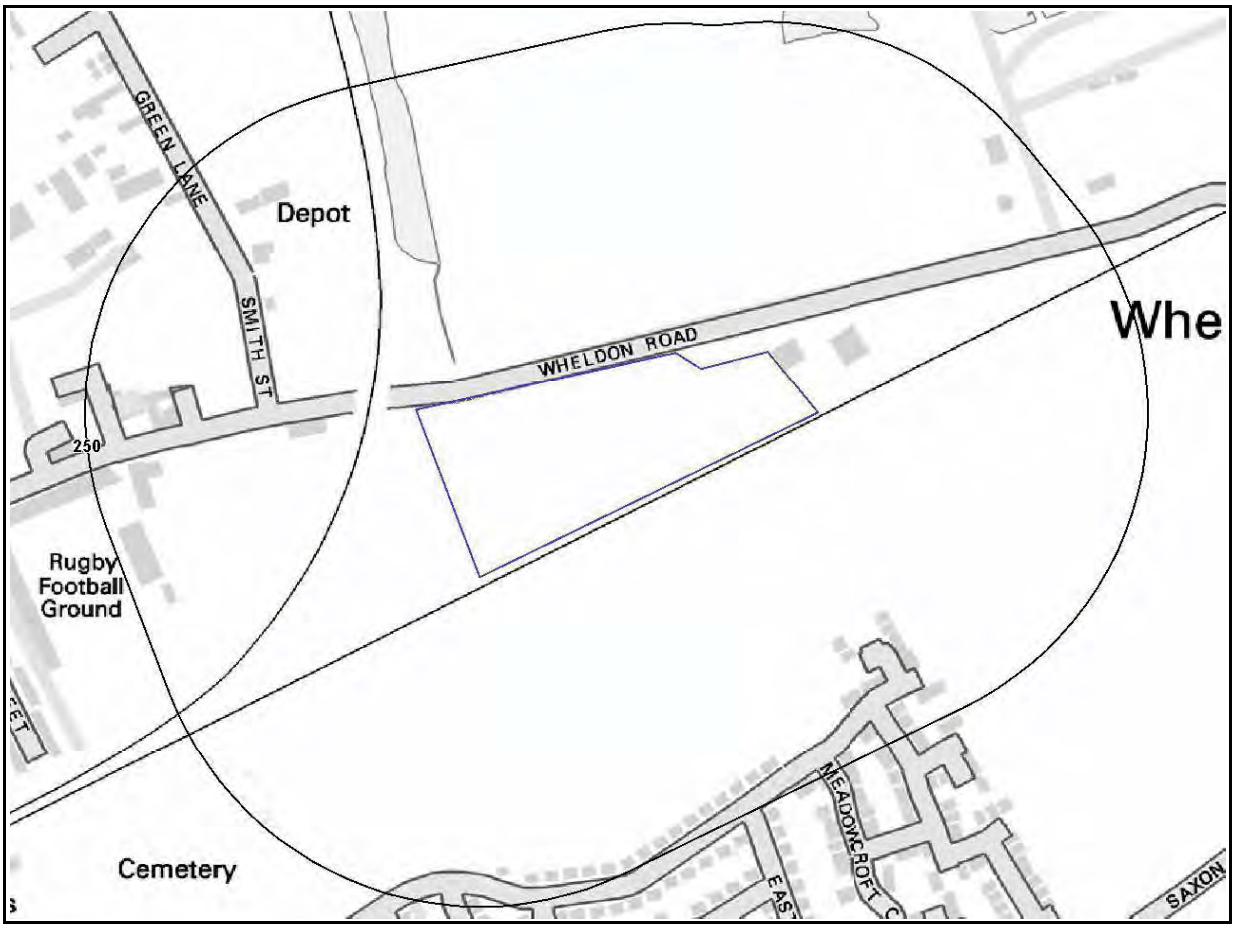
Low
Moderate
High

4.3 Ground Dissolution Soluble Rocks Map

NW N NE

W E

SW S SE



Ground Dissolution Soluble Rocks Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null

Negligible

Very Low

Low

Moderate

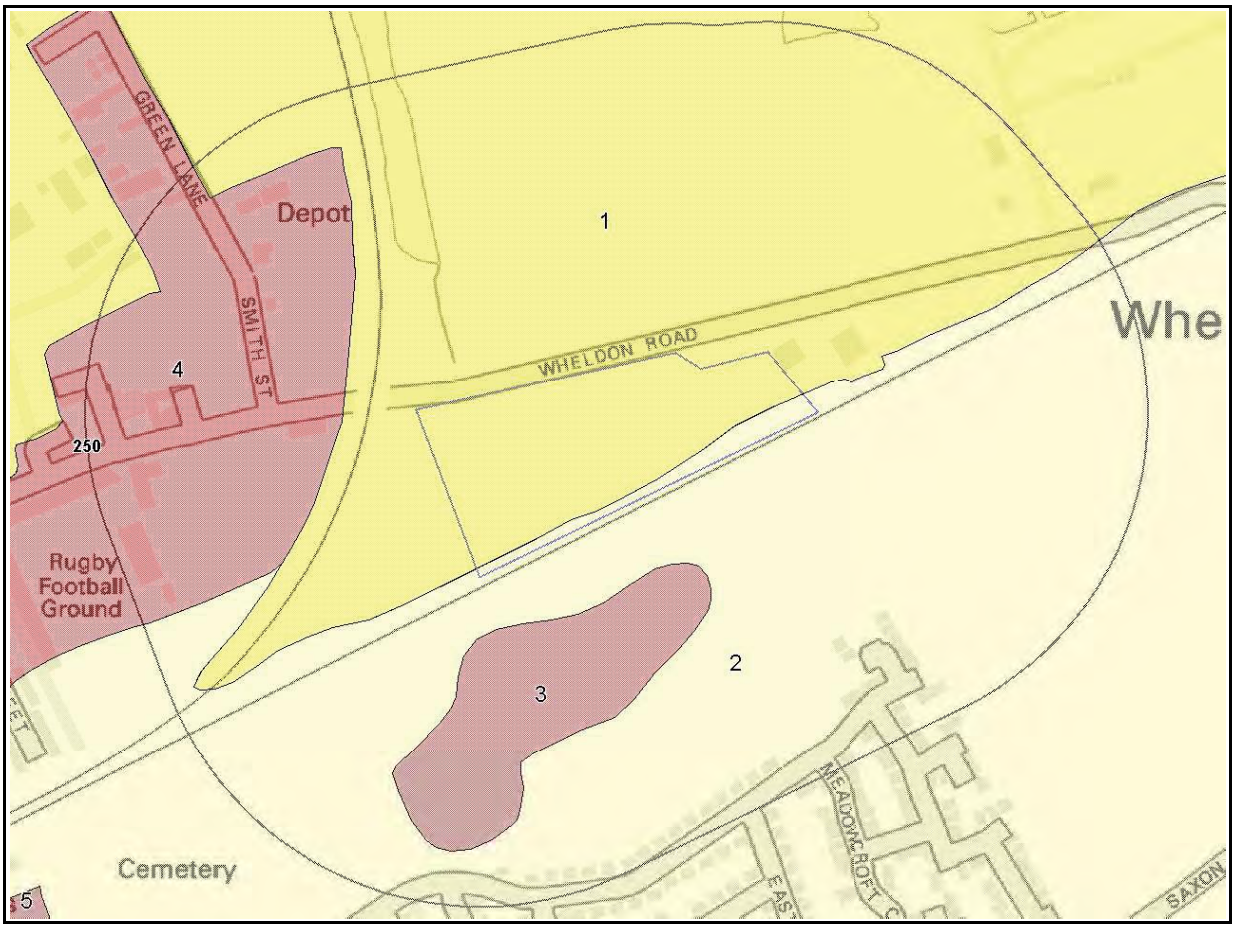
High

4.4 Compressible Deposits Map

NW N NE

W E

SW S SE



Compressible Deposits Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

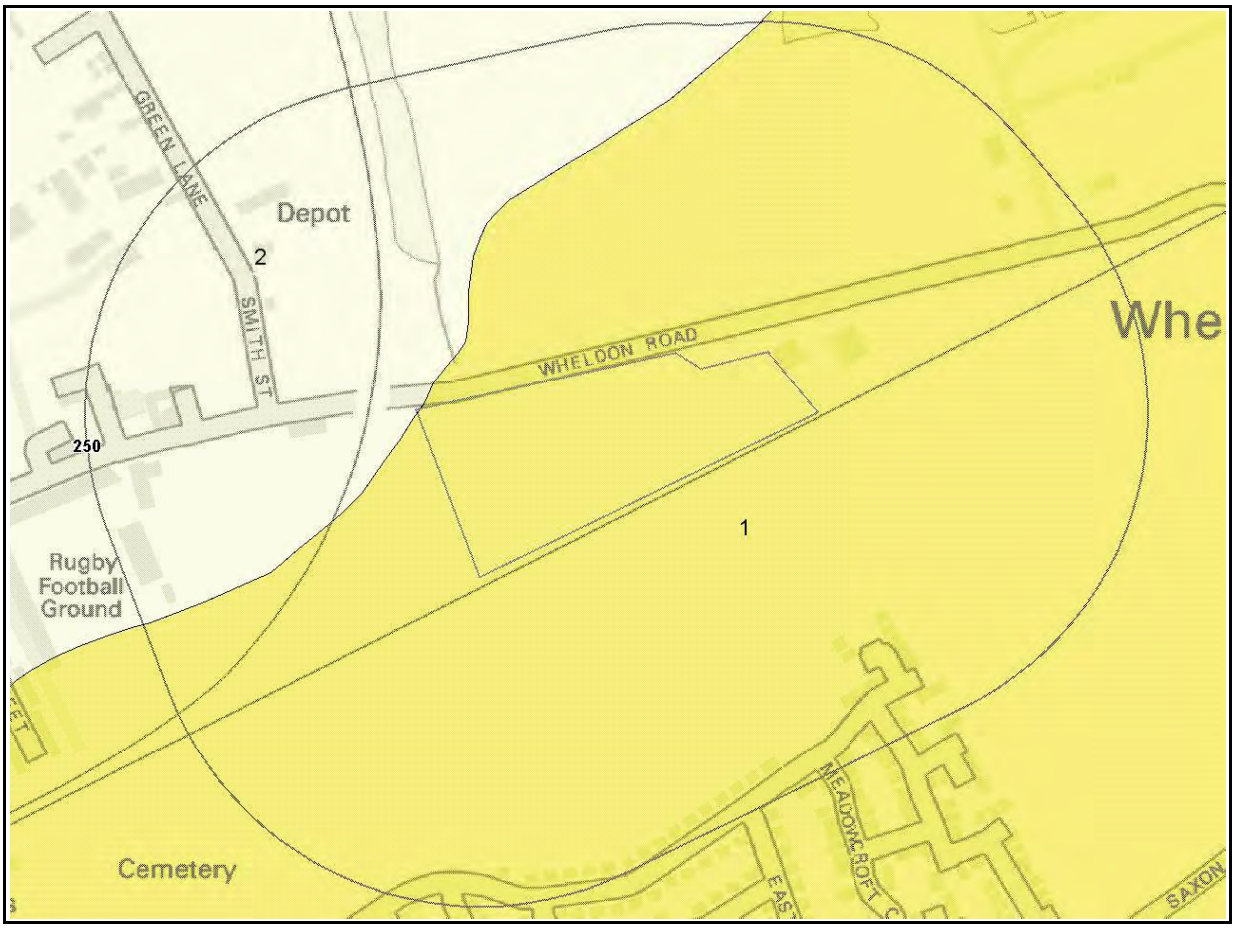
Low
Moderate
High

4.5 Collapsible Deposits Map

NW N NE

W E

SW S SE



Collapsible Deposits Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null

Negligible

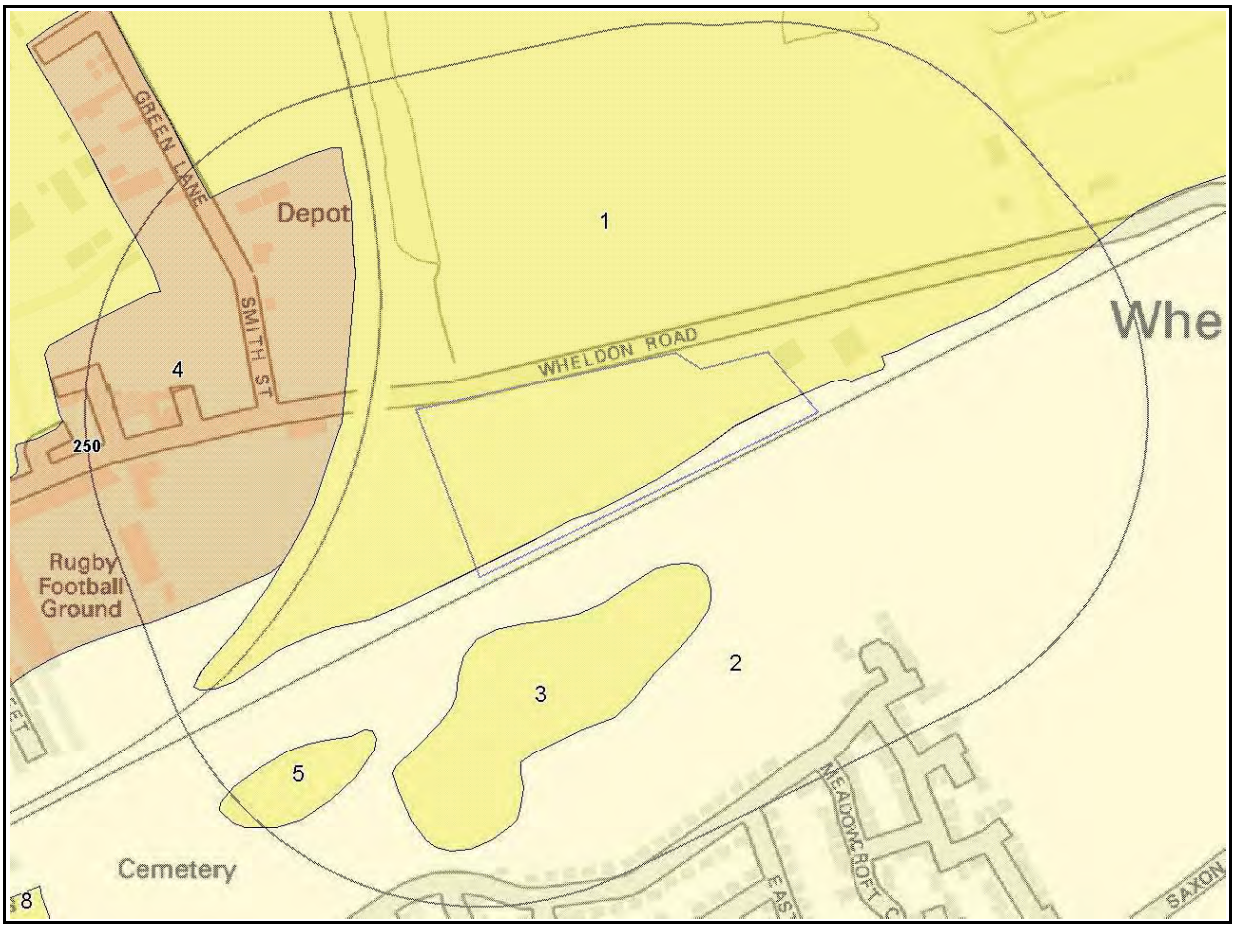
Very Low

Low

Moderate

High

4.6 Running Sand Map



Running Sand Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null

Negligible

Very Low

Low

Moderate

High

4.Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary? Moderate

4.1 Shrink – Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

4.3 Ground Dissolution of Soluble Rocks

The following Soluble Rocks information provided by the British Geological Survey:

Distance (m)*	Direction	Hazard Rating	Details
0.0	On site	Null-Negligible	Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

4.4 Compressible Deposits

The following Compressible Ground information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

*This includes an automatically generated 50m buffer zone around the study site boundary.

2	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
3	41.0	S	Moderate	Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property - possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

4.5 Collapsible Deposits

The following Collapsible Rocks information is provided by the British Geological Survey:

ID	Distance (m) *	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

4.6 Running Sands

The following Running Sands information is provided by the British Geological Survey:

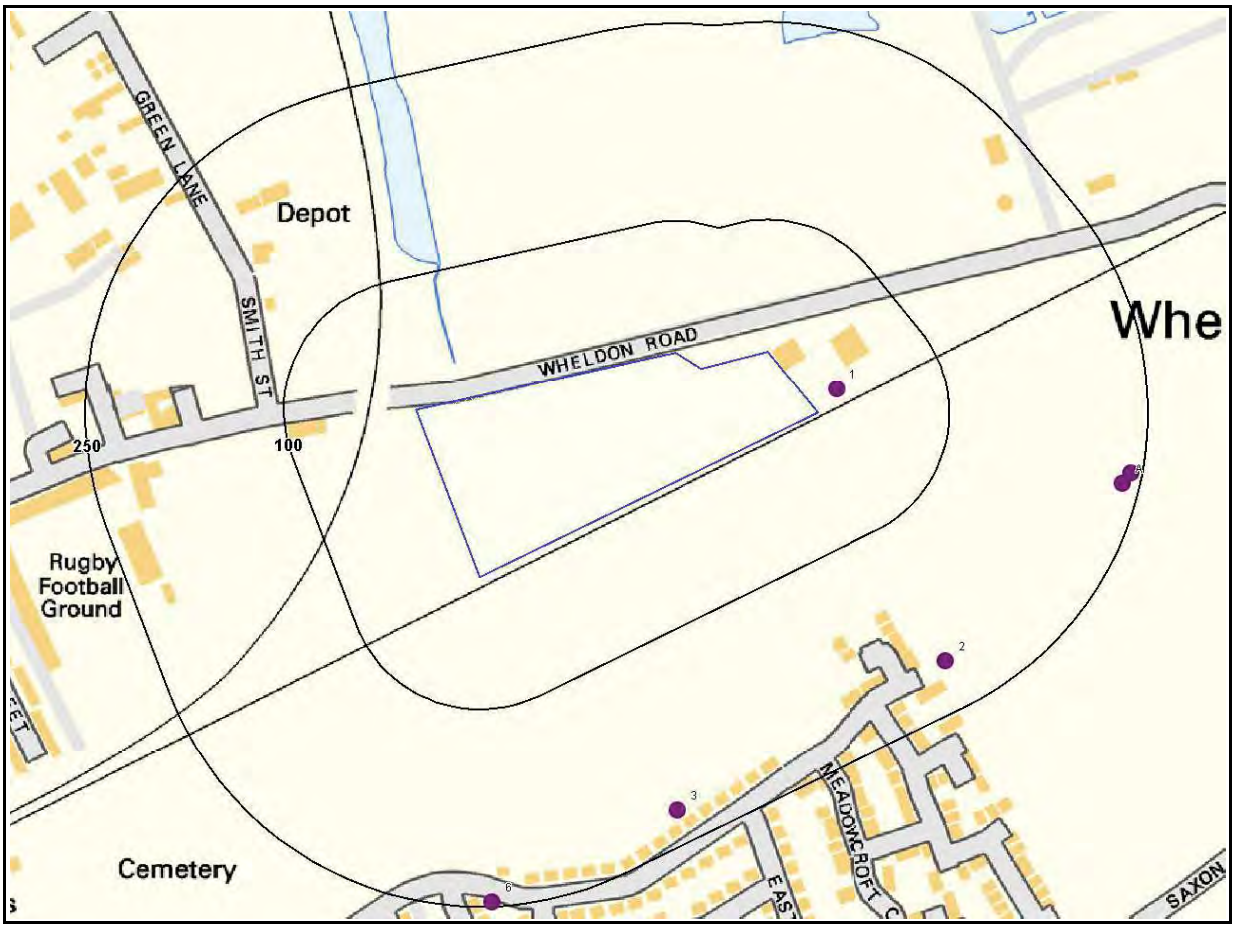
ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
3	41.0	S	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

5. Borehole Records Map

NW N NE

W E

SW S SE



Borehole Records Legend

Site Outline

Borehole Locations

125
250
Search Buffers (m)

5.Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary: **6**

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length (m)	Borehole Name
1	22.0	NE	444150,426260	SE42NW13	524.0	WHELDALE COLLIERY
2	212.0	SE	444233,426053	SE42NW457	14.94	REDHILL CASTLEFORD 15
3	225.0	SE	444030,425940	SE42NW281	-1.0	HEALDFIELD ROAD HOUSING DEVELOPMENT
4A	236.0	E	444366,426188	SE42NW327	3.0	REDHILL ESTATE 6
5A	241.0	E	444373,426196	SE42NW342	15.0	REDHILL ESTATE R10
6	247.0	S	443890,425870	SE42NW278	-1.0	HEALDFIELD ROAD HOUSING DEVELOPMENT

6.Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary: 3

For further information on how this data is calculated and limitations upon its use, please see the GroundSure GeoInsight User Guide, available on request.

			Estimated Geometric Mean Soil Concentrations (mg/kg)				
Distance (m)*	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg	<150 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<150 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

GroundSure EnviroInsight

Address: Allerton Bywater

Date: Jan 6, 2012

GroundSure Reference: EMS-149284_215262

Your Reference: EMS_149284_215262

Client: EmapSite

Brought to you by emapsite

Aerial Photograph of Study Site

NW ▲ N NE

◄W E►

SW ▼ S SE

Site Name: Allerton Bywater
Grid Reference: 443969,426218
Size of Site: 2.74 ha

Overview of Findings

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

Report Section	Number of records found within (X) m of the study site boundary					
1. Environmental Permits, Incidents and Registers	on-site	0-50	51-250	251-500	501-1000	1000-1500
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
Records of historic IPC Authorisations	0	0	0	0	-	-
Records of Part A(1) and IPPC Authorised Activities	0	0	4	0	-	-
Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0	-	-
Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0	-	-
Records of List 1 Dangerous Substances Inventory sites	0	0	1	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	1	-	-
Records of Licensed Discharge Consents	0	0	0	0	-	-
Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0		
1.2 Records of COMAH and NIHHS sites	0	0	1	0	-	-
1.3 Environment Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	0	4	10	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-
2. Landfill and Other Waste Sites	on-site	0-50	51-250	251-500	501-1000	1000-1500
2.1 Landfill Sites						
Environment Agency Registered Landfill Sites	0	0	0	1	0	-
Landfill Data – Operational Landfill Sites	0	0	0	0	1	-
Environment Agency Historic Landfill Sites	1	2	2	1	0	2
Landfill Data – Non-Operational Landfill Sites	0	1	3	1	1	-
BGS/DoE Landfill Site Survey	0	0	1	0	0	0
GroundSure Local Authority Landfill Sites Data	0	2	1	0	0	2
2.2 Landfill and Other Waste Sites Findings						
Operational Waste Treatment, Transfer and Disposal Sites	0	0	3	2	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	1	1	-	-
Environment Agency Licensed Waste Sites	0	0	4	0	5	2

3. Current Land Uses

	on-site	0-50	51-250	251-500	501-1000	1000-1500
3.1 Current Industrial Sites Data	0	0	11	-	-	-
3.2 Records of Petrol and Fuel Sites	0	0	0	0	-	-
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0	-	-

4. Geology

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

Source: Scale: 1:50,000 BGS Sheet 078

* This includes an automatically generated 50m buffer zone around the site.

5. Hydrogeology and Hydrology

	on-site	0-50	51-250	251-500	501-1000	1001-2000
5.1 Are there any records of Productive Strata in the Superficial Geology within 500m of the study site?				Yes		
5.2 Are there any records of Productive Strata in the Bedrock Geology within 500m of the study site?				Yes		
5.3 Groundwater Abstraction Licences (within 1000m of the study site).	0	0	0	0	8	-
5.4 Surface Water Abstraction Licences (within 1000m of the study site).	0	0	0	1	7	-
5.5 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	0
5.6 Are there any Source Protection Zones within 500m of the study site?					No	

5.7 River Quality	on-site	0-50	51-250	251-500	501-1000	1001-1500
Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	Yes	Yes
5.8 Detailed River Network entries within 500m of the site	0	0	0	0	-	-
5.9 Surface water features within 250m of the study site	No	Yes	Yes	-	-	-

6. Flooding

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

7. Designated Environmentally Sensitive Sites

	on-site	0-50	51-250	251-500	501-1000	1001-1500
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	-	-
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	-	-

7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	-	-
7.3 Records of Local Nature Reserves (LNR)	0	0	0	0	-	-
7.4 Records of Special Areas of Conservation (SAC)	0	0	0	0	-	-
7.5 Records of Special Protection Areas (SPA)	0	0	0	0	-	-
7.6 Records of Ramsar sites	0	0	0	0	-	-
7.7 Records of World Heritage Sites	0	0	0	0	-	-
7.8 Records of Environmentally Sensitive Areas	0	0	0	0	-	-
7.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	-	-
7.10 Records of National Parks	0	0	0	0	-	-
7.11 Records of Nitrate Sensitive Areas	0	0	0	0	-	-
7.12 Records of Nitrate Vulnerable Zones	0	0	0	0	-	-

8. Natural Hazards

8.1 What is the maximum risk of natural ground subsidence?	Moderate

9. Mining

9.1 Are there any coal mining areas within 75m of the study site?	Yes
9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site?	Low-Moderate
9.3 Are there any brine affected areas within 75m of the study site?	No

Using this Report

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

1. Environmental Permits, Incidents and Registers

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

2. Landfills and Other Waste Sites

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

3. Current Land Uses

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

4. Geology

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

5. Hydrogeology and Hydrology

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

6. Flooding

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

7. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites. These searches are conducted using radii of up to 500m.

8. Natural Hazards

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

9. Mining

Provides information on areas of coal and shallow mining.

10. Contacts

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

Note: Maps

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

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

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

1. Environmental Permits, Incidents and Registers Map

NW N NE

W E

SW S SE

Authorisations,Incidents and Registers Legend

- Site Outline
- Search Buffers (m) 250 500
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

1.Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

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

Records of historic IPC Authorisations within 500m of the study site: 0

Database searched and no data found.

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: 4

The following Part A(1) and IPPC Authorised Activities are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
22E	201.0	N	444160, 426480	Operator: Yorkshire Water Services Limited Installation Name: Wheldale Sludge Treatment Facility Process: OTHER WASTE DISPOSAL; NON-HAZARDOUS WASTE >50T/D BY PHYSICO-CHEMICAL TREATMENT	Permit Number: KP3636LU Original Permit Number: KP3636LU EPR Reference: - Issue Date: 26/4/2007 Effective Date: 26/4/2007 Last date noted as effective: 2011-11-01 Status: Superceded
23E	201.0	N	444160, 426480	Operator: Yorkshire Water Services Limited Installation Name: Wheldale Sludge Treatment Facility Process: ASSOCIATED PROCESS	Permit Number: KP3636LU Original Permit Number: KP3636LU EPR Reference: - Issue Date: 26/4/2007 Effective Date: 26/4/2007 Last date noted as effective: 2011-11-01 Status: Superceded
24E	201.0	N	444160, 426480	Operator: Yorkshire Water Services Limited Installation Name: Wheldale Sludge Treatment Facility Process: ASSOCIATED PROCESS	Permit Number: VP3137UW Original Permit Number: KP3636LU EPR Reference: - Issue Date: 23/9/2008 Effective Date: 23/9/2008 Last date noted as effective: 2011-11-01 Status: Effective
25E	201.0	N	444160, 426480	Operator: Yorkshire Water Services Limited Installation Name: Wheldale Sludge Treatment Facility Process: OTHER WASTE DISPOSAL; NON-HAZARDOUS WASTE >50T/D BY PHYSICO-CHEMICAL TREATMENT	Permit Number: VP3137UW Original Permit Number: KP3636LU EPR Reference: - Issue Date: 23/9/2008 Effective Date: 23/9/2008 Last date noted as effective: 2011-11-01 Status: Effective

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Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 0

Database searched and no data found.

Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 0

Database searched and no data found.

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

The following List 1 Dangerous Substance Inventory Site records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
15	222.0	NE	444310, 426380	Name: Castleford (wheldale) Stw Status: Active Receiving Water: Aire, Humber	Authorised Substances: Hexachlorobenzene, Chloroform, Trichlorobenzene

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: **0**

Database searched and no data found.

Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: **0**

Database searched and no data found.

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: **1**

The following RAS Licence (3 or 4) records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance [m]	Direction	Address	Operator	Type	Permission Number	Dates	Status
26F	435.0	W	Hickson And Welch Ltd, Hickson And Welch Castleford Site Wheldon Road, Castleford, West Yorkshire, WF10 2JT	Hickson And Welch Ltd	Keeping And Use Of Radioactive Materials (was Rsa60 Section 1).	AH6350	Date of Approval:- Effective from:- Last date of update:2001-06-01	-

Records of Licensed Discharge Consents within 500m of the study site: **0**

Database searched and no data found.

Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: **0**

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: **1**

The following COMAH & NIHHS Authorisation records provided by the Health and Safety Executive are represented as polygons or buffered points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Address	Type	Update

21	169.0	NW	443300, 426500	hickson and welch ltd,wheldon road,castleford,wf10 2jt	COMAH	2001

1.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: 14

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
1A	39.0	N	443909, 426301	Incident Date: 13/3/2003 Incident Identification: 143058 Pollutant: Specific Waste Materials Pollutant Description: Asbestos	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
2A	39.0	N	443909, 426301	Incident Date: 13/3/2003 Incident Identification: 143058 Pollutant: Specific Waste Materials Pollutant Description: Household Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
3A	39.0	N	443909, 426301	Incident Date: 13/3/2003 Incident Identification: 143058 Pollutant: Specific Waste Materials Pollutant Description: Tyres	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
4A	39.0	N	443909, 426301	Incident Date: 13/3/2003 Incident Identification: 143058 Pollutant: Specific Waste Materials:Specific Waste Materials:Specific Waste Materials Pollutant Description: Asbestos:Household Waste:Tyres	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
5	139.0	NW	443716, 426319	Incident Date: 20/11/2003 Incident Identification: 202694 Pollutant: Specific Waste Materials Pollutant Description: Vehicles and Vehicle Parts	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
6B	173.0	NW	443681, 426326	Incident Date: 23/2/2005 Incident Identification: 295238 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 2 (Significant)
7B	173.0	NW	443681, 426326	Incident Date: 23/2/2005 Incident Identification: 295238 Pollutant: Specific Waste Materials Pollutant Description: Household Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 2 (Significant)
8C	180.0	NW	443693, 426357	Incident Date: 13/3/2003 Incident Identification: 143054 Pollutant: Specific Waste Materials Pollutant Description: Tyres	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
9D	192.0	NW	443674, 426351	Incident Date: 11/8/2006 Incident Identification: 426722 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 2 (Significant)
10C	192.0	NW	443674, 426351	Incident Date: 11/8/2006 Incident Identification: 426722 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 2 (Significant)
11D	193.0	NW	443673, 426352	Incident Date: 12/4/2006 Incident Identification: 390399 Pollutant: Specific Waste Materials Pollutant Description: Household Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
12C	193.0	NW	443673, 426352	Incident Date: 12/4/2006 Incident Identification: 390399 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
13C	193.0	NW	443673, 426352	Incident Date: 12/4/2006 Incident Identification: 390399 Pollutant: Specific Waste Materials Pollutant Description: Tyres	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)

14	204.0	NW	443688, 426387	Incident Date: 13/11/2003 Incident Identification: 201508 Pollutant: Specific Waste Materials Pollutant Description: Other Specific Waste Material	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

Records of National Incidents Recording System, List 1 within 250m of the study site: **0**

Database searched and no data found.

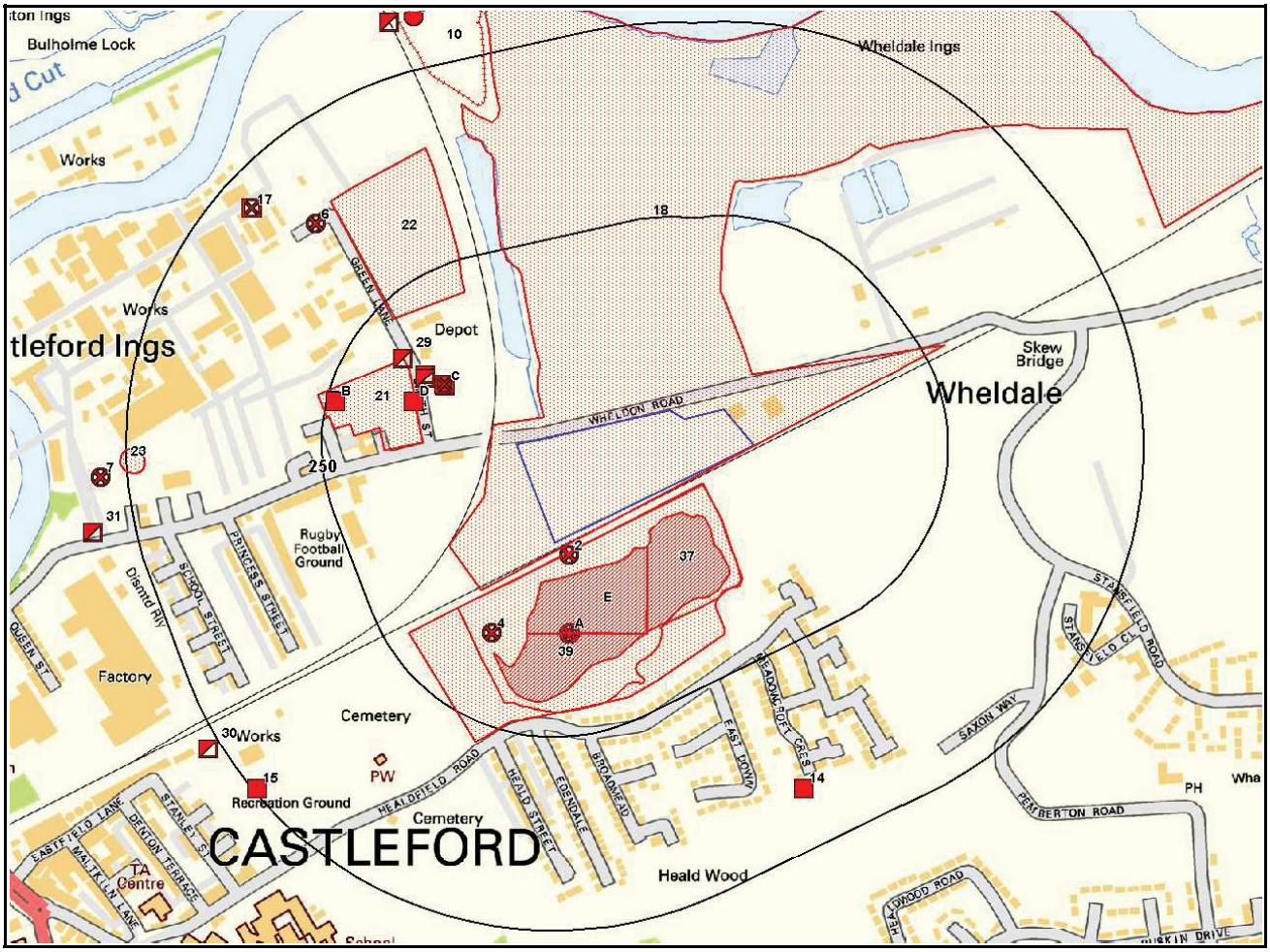
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? **0**

Database searched and no data found.

2. Landfill and Other Waste Sites Map

NW N NE



W E

SW S SE

Landfill & Other Waste Sites Legend

- Site Outline
- Search Buffers (m) — 250 / 500
- E.A. Active Landfill
- E.A. Historic Landfill (Area Data)
- E.A. Historic Landfill (Point Data)
- BGS / DoE Survey Landfill
- Local Authority Landfill (Area Data)
- Local Authority Landfill (Point Data)
- Operational Waste Treatment Licence
- Closed Waste Treatment Licence
- REGIS Waste Licence
- Operational Landfill
- Closed Landfill

2. Landfill and Other Waste Sites

2.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site: 1

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

ID	Distance	Direction	NGR	Details	
10	437.0	N	443669, 426789	Address: Ings Lane, Wheldale, Castleford, West Yorkshire, WF10 2JT Landfill Reference: 61743.0 Regis Reference: HIC003 Landfill Type: A7 : Industrial Waste Landfill (Factory curtilage)	Operator: Hickson Limited Status: Closure IPPC Reference: EPR Reference:

Records of operational landfill sites sourced from Landmark within 1000m of the study site: 1

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

ID	Distance	Direction	NGR	Details	
1	567.0	N	443700, 426795	Site Address: South Bank of River Aire, Wheldale, CASTLEFORD, West Yorkshire, Agency Reference: EAWML61743 Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: Only waste produced on site	Record Date: 01-Feb-1981 Transfer Date: Modification Date: 01-Nov-1997 Status: Operational as far as is known Category: LANDFILL Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)

Records of Environment Agency historic landfill sites within 1500m of the study site: 8

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

ID	Distance	Direction	NGR	Details	
18	0.0	On Site	445100, 426800	Site Address: Wheldale Fryston Colliery Reclamation / River Ban, Wheldon Road, Castleford, West Yorkshire Waste Licence: Yes Site Reference: 4700/1297 Waste Type: Inert Regis Reference: -	Licence Issue: 29-Jul-1993 Licence Surrendered: 26-May-1994 Licence Hold Address: Environmental Services Department, King Charles II House, Headlands Road, Pontefract Operator: -
19A	15.0	SE	443900, 426000	Site Address: Healdfield Quarry Reclamation Site, Healdfield Road, Castleford Waste Licence: Yes Site Reference: 4700/1313 Waste Type: Inert Regis Reference: -	Licence Issue: 15-Oct-1993 Licence Surrendered: 06-Jun-1994 Licence Hold Address: Environmental Services Department, King Charles II House, Headlands Road, Pontefract Operator: -
20E	17.0	SE	443900, 426000	Site Address: Healdfield Brickwork Quarry, Headfield Road, Castleford, West Yorkshire Waste Licence: Yes Site Reference: WD20 D13, 4700/0557, 4700/0205, 47 Waste Type: Inert, Industrial, Commercial, Household, Special, Liquid sludge Regis Reference: -	Licence Issue: 02-Jan-1980 Licence Surrendered: 25-May-1994 Licence Hold Address: 18 Carlyle Road, Castleford Operator: Hargreaves (West Riding) Limited

21	121.0	W	443600, 426200	Site Address: Old Recreation Ground, Smith Street, Castleford Waste Licence: Yes Site Reference: 4700/0795 Waste Type: Inert Regis Reference: -	Licence Issue: 12-Jun-1992 Licence Surrendered: 01-Apr-1993 Licence Hold Address: Green Lane, Smith Street, Castleford Operator: -
22	208.0	N	443600, 426500	Site Address: East End Of Works, Ings Lane, Castleford Waste Licence: Yes Site Reference: 9, 4700/0010 Waste Type: Inert, Industrial, Commercial, Household, Liquid sludge Regis Reference: -	Licence Issue: 09-Nov-1976 Licence Surrendered: 16-Mar-1993 Licence Hold Address: Chemical Manufacturers, Ings Lane, Castleford, West Yorkshire Operator: -
23	476.0	W	443300, 426200	Site Address: Ryebread Street, Castleford Waste Licence: Yes Site Reference: 4700/0470 Waste Type: Inert, Commercial Regis Reference: -	Licence Issue: 20-Nov-1984 Licence Surrendered: 31-Mar-1987 Licence Hold Address: New York Road, Leeds Operator: -
Not shown	1407.0	NE	445700, 426800	Site Address: Wheldale Lane, Fryston, Castleford, West Yorkshire Waste Licence: - Site Reference: 4700/WY097 Waste Type: Commercial Regis Reference: -	Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: Castleford Corporation
Not shown	1462.0	W	442100, 426200	Site Address: Laporte's Chemical Works, Cinder Lane, Castleford, West Yorkshire Waste Licence: - Site Reference: - Waste Type: Inert, Industrial Regis Reference: -	Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: Laporte Industries Limited

Records of non-operational landfill sites sourced from Landmark within 1000m of the study site: 6

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

ID	Distance	Direction	NGR	Details	
2	24.0	SE	443900, 426100	Site Address: Healdfield Road Quarry Reclamation Site, CASTLEFORD, West Yorkshire Landfill Licence: 45EBWXAL Agency Reference: Waste Type: Inert Waste Description: Inert Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Oct-1993 Transfer Date: Modification Date: Status: Site now exempt from licencing Category: LANDFILL Regulator: EA - North East Region - Ridings Area (East) Size: Medium (< 75,000 tonnes/year)
3A	119.0	S	443900, 426000	Site Address: Healdfield Quarry., Healdfield Road, CASTLEFORD, West Yorkshire, Landfill Licence: 45EBDCAL Agency Reference: Waste Type: Inert Waste Description: Inert Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Mar-1986 Transfer Date: Modification Date: 01-Jul-1988 Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - North East Region - Ridings Area (East) Size: Undefined
4	142.0	SW	443800, 426000	Site Address: Healdfield Quarry, Healdfield Road, CASTLEFORD, West Yorkshire, Landfill Licence: 45EBBDAL Agency Reference: Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Jan-1980 Transfer Date: Modification Date: 01-May-1981 Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - North East Region - Ridings Area (East) Size: Undefined
5B	240.0	W	443600, 426300	Site Address: Old Recreation Ground, Smith Street, CASTLEFORD, West Yorkshire, Landfill Licence: 45EBVJAL Agency Reference: Waste Type: Inert Waste Description: Inert Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Jun-1992 Transfer Date: Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - North East Region - Ridings Area (East) Size: Small (<25,000 tonnes/year)

6	384.0	NW	443575, 426529	Site Address: Ings Lane, CASTLEFORD, West Yorkshire, WF10 2JT Landfill Licence: 45EATMAL Agency Reference: Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: Only waste produced on site	Record Date: 01-Jan-1977 Transfer Date: Modification Date: 01-Jul-1988 Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - North East Region - Ridings Area (East) Size: Medium (< 75,000 tonnes/year)
7	535.0	W	443300, 426200	Site Address: Ryebread Street, CASTLEFORD, West Yorkshire Landfill Licence: 45EAYWAL Agency Reference: Waste Type: Inert Waste Description: Inert Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Dec-1984 Transfer Date: Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - North East Region - Ridings Area (East) Size: Undefined

Records of BGS/DoE non-operational landfill sites within 1500m of the study site: **1**

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

ID	Distance	Direction	NGR	Details	
9A	119.0	S	443900, 426000	Address: Healdfield Road, Castleford BGS Number: 315.0	Risk: Serious risk to minor aquifer Waste Type: N/A

Records of Local Authority landfill sites within 1500m of the study site: **5**

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

ID	Distance	Direction	Site Address	Source	Data Type
37	32.0	SE	Refuse Tip	1972 mapping	Polygon
38E	45.0	S	Refuse Tip	1971 mapping	Polygon
39	117.0	S	Refuse Tip	1971 mapping	Polygon
Not shown	1223.0	NE	Refuse Tip	1963 mapping	Polygon
Not shown	1499.0	W	Refuse Tip	1971 mapping	Polygon

2.2 Other Waste Sites

Records of operational waste treatment, transfer or disposal sites within 500m of the study site: **5**

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

ID	Distance	Direction	NGR	Details	
11C	120.0	NW	443740, 426320	Site Address: Smith Street, Wheldon Road, CASTLEFORD, West Yorkshire, WF10 2QH Landfill Licence: 45EBXJAL EA Reference: EAWML61867 Waste Type: Non-Hazardous Rating: Non-Hazardous Scrapyard Known Restrictions: No known restriction on source of waste	Record Date: 01-Sep-1994 Transfer Date: 01-Aug-1999 Modification Date: 01-Nov-1997 Status: Operational as far as is known Category: SCRAPYARD Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)
12D	144.0	NW	443700, 426300	Site Address: Mary Lou Works, Smith Street, CASTLEFORD, West Yorkshire, Landfill Licence: 45EBVCAL EA Reference: EAWML61830 Waste Type: Difficult Rating: Difficult Scrapyard Known Restrictions: No known restriction on source of waste	Record Date: 01-Jun-1992 Transfer Date: Modification Date: 01-Nov-1997 Status: Operational as far as is known Category: SCRAPYARD Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)

13B	240.0	W	443600, 426300	Site Address: Green Lane Smith Street, Wheldon Road, CASTLEFORD, West Yorkshire, Landfill Licence: 45EBXAAL EA Reference: EAWML61875 Waste Type: Non-Hazardous Rating: Non-Hazardous Scrapyard Known Restrictions: No known restriction on source of waste	Record Date: 01-Oct-1993 Transfer Date: Modification Date: 01-Nov-1997 Status: Operational as far as is known Category: SCRAPYARD Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)
14	425.0	SE	444200, 425800	Site Address: Cinder Lane New H.W.Site, CASTLEFORD, West Yorkshire, Landfill Licence: 45EBXXAL EA Reference: EAWML61910 Waste Type: Putrescible Rating: Putrescible Transfer Known Restrictions: No known restriction on source of waste	Record Date: 01-Mar-1996 Transfer Date: 01-Apr-1999 Modification Date: 01-Nov-1997 Status: Operational as far as is known Category: CIVIC AMENITY Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)
15	496.0	SW	443500, 425800	Site Address: Castleford Motor Spares, Eastfield Lane, CASTLEFORD, West Yorkshire, Landfill Licence: 45EAAJAL EA Reference: EAWML61805 Waste Type: Difficult Rating: Difficult Scrapyard Known Restrictions: No known restriction on source of waste	Record Date: 01-Apr-1991 Transfer Date: 01-Mar-1995 Modification Date: 01-Nov-1997 Status: Operational as far as is known Category: SCRAPYARD Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: 2

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

ID	Distance	Direction	NGR	Details	
16C	120.0	NW	443740, 426320	Site Address: Find A Spare U.K Autowreckers, Smith Street, CASTLEFORD, West Yorkshire, Landfill Licence: 45EBVSAL EA Reference: - Waste Type: Non-Hazardous Waste Description: - Known Restrictions: No known restriction on source of waste	Record Date:01-Aug-1993 Transfer Date: Modification Date: Status: Record superseded Category: SCRAPYARD Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)
17	455.0	NW	443493, 426547	Site Address: Ings Lane, CASTLEFORD, West Yorkshire, WF10 2JT Landfill Licence: 45EATNAL EA Reference: - Waste Type: Difficult Waste Description: - Known Restrictions: Only waste produced on site	Record Date:01-May-1981 Transfer Date: Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: INCINERATION Regulator: EA - North East Region - Ridings Area (East) Size: Very Small (<10,000 tonnes/year)

Records of Environment Agency licensed waste sites within 1500m of the study site: 11

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

ID	Distance	Direction	NGR	Details	
26D	145.0	NW	443715, 426329	Site Address: Land / Premises At, Smith Street, Castleford, West Yorkshire, WF10 2RY Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: JBG001 EPR reference: EA/EPR/FP3298ZV/A001 Operator: J B Garahan Ltd Waste Management licence No: 61830 Annual Tonnage: 6000.0	Issue Date: 12/06/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Mary Lou Works Correspondence Address: -

27C	148.0	NW	443716, 426334	Site Address: Off Wheldon Road, Castleford, West Yorkshire, WF10 2QH Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: MRJ003 EPR reference: - Operator: Mr Jason Gill Waste Management licence No: 61867 Annual Tonnage: 0.0	Issue Date: 11/08/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Smith Street Correspondence Address: Smith Street, Off Wheldon Rd, Castleford, West Yorkshire, WF10 2QH
28C	148.0	NW	443716, 426334	Site Address: Off Wheldon Road, Castleford, West Yorkshire, WF10 2QH Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: MRJ003 EPR reference: EA/EPR/ZP3698ZD/A001 Operator: Mr Jason Neil Gill Waste Management licence No: 61867 Annual Tonnage: 252.0	Issue Date: 11/08/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Suspended Site Name: Smith Street Correspondence Address: -
29	184.0	NW	443687, 426356	Site Address: Off Smith Street, Wheldon Road, Castleford, West Yorkshire, Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: MRP003 EPR reference: EA/EPR/ZP3798ZJ/S002 Operator: Mr P Downham Waste Management licence No: 61875 Annual Tonnage: 40.0	Issue Date: 15/10/1993 Effective Date: - Modified: - Surrendered Date: 15/03/2002 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Green Lane Correspondence Address: -
30	516.0	SW	443438, 425852	Site Address: Land / Premises At, Eastfield Lane, Castleford, West Yorkshire, WF10 4LD Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: MRS004 EPR reference: EA/EPR/HP3798ZM/A001 Operator: Mr S Wagstaff Waste Management licence No: 61805 Annual Tonnage: 875.0	Issue Date: 29/04/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Castleford Motor Spares Correspondence Address: -
31	555.0	W	443290, 426131	Site Address: Land / Premises At, Wheldon Road, Castleford, West Yorkshire, WF10 2JT Type: In-House Storage Facility Size: < 25000 tonnes Regis Licence Number: HIC002 EPR reference: EA/EPR/HP3198ZV/A001 Operator: Hickson Ltd Waste Management licence No: 61804 Annual Tonnage: 13000.0	Issue Date: 09/08/1990 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Hickson & Welch Chemical Works Correspondence Address: -
32	569.0	N	443669, 426789	Site Address: Ings Lane, Wheldale, Castleford, West Yorkshire, WF10 2JT Type: Industrial Waste Landfill (Factory curtilage) Size: < 25000 tonnes Regis Licence Number: HIC003 EPR reference: EA/EPR/HP3098ZN/A001 Operator: Hickson Limited Waste Management licence No: 61743 Annual Tonnage: 75000.0	Issue Date: 03/02/1981 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Closure Site Name: Land Adjacent To South Bank Of River Aire Correspondence Address: -
Not shown	915.0	W	442933, 426080	Site Address: Lock Lane, Castleford, West Yorkshire, WF10 2JU Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: MOR004 EPR reference: - Operator: Morley Waste Traders Limited Waste Management licence No: 61799 Annual Tonnage: 0.0	Issue Date: 28/06/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: - Correspondence Address: Kaystan Ironworks, Albert Road, Morley, West Yorkshire, LS27 8RU

Not shown	915.0	W	442933, 426080	Site Address: Land / Premises At, Lock Lane, Castleford, West Yorkshire, WF10 2JU Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: MOR004 EPR reference: EA/EPR/HP3698ZS/A001 Operator: Morley Waste Traders Ltd Waste Management licence No: 61799 Annual Tonnage: 13800.0	Issue Date: 28/06/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Morley Waste Traders Ltd Correspondence Address: -
Not shown	1271.0	NE	445307, 426736	Site Address: Fryston, Castleford, West Yorkshire, WF10 2EP Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: FRY001 EPR reference: EA/EPR/CP3198ZF/A001 Operator: Fryston Recovery Ltd Waste Management licence No: 61848 Annual Tonnage: 485.0	Issue Date: 04/12/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Wheldon Road Correspondence Address: -
Not shown	1314.0	E	445400, 426600	Site Address: Fryston, Castleford, West Yorkshire, WF10 2PY Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: MRG001 EPR reference: EA/EPR/NP3898ZC/S002 Operator: Mr Geoff Womersley Jnr Waste Management licence No: 61891 Annual Tonnage: 200.0	Issue Date: 30/11/1995 Effective Date: - Modified: - Surrendered Date: 21/05/2001 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Lime Quarry Correspondence Address: -

3. Current Land Use Map

NW N NE

◄W E►

SW S SE

Current Land Use Legend

Site Outline

250
500
Search Buffers (m)

Current Industrial Sites

Petrol & Fuel Sites

Underground High Pressure Oil & Fuel Pipelines

3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: **11**

The following records are represented as points on the Current Land Uses map.

ID	Distance	Direction	Company	Address	Activity	Category
1A	95.0	W	M T Specialist Cars	118, Wheldon Road, Castleford, WF10 2RT	Vehicle Repair, Testing and Servicing	Repair and Servicing
2A	95.0	W	Balancebest Ltd	118, Wheldon Road, Castleford, WF10 2RT	Giftware	Consumer Products
3	127.0	NW	Scrap Yard	WF10	Scrap Metal Merchants	Recycling Services
4	165.0	NW	Electricity Sub Station	WF10	Electrical Features	Infrastructure and Facilities
5	172.0	NW	Depot	WF10	Container and Storage	Transport, Storage and Delivery
6B	196.0	NW	Wensley Transport	Green Lane, Castleford, WF10 2RY	Distribution and Haulage	Transport, Storage and Delivery
7B	196.0	NW	Kenneth Howley Transport Ltd	Green Lane, Castleford, WF10 2RY	Distribution and Haulage	Transport, Storage and Delivery
8	205.0	SE	Electricity Sub Station	WF10	Electrical Features	Infrastructure and Facilities
9	210.0	W	Electricity Sub Station	WF10	Electrical Features	Infrastructure and Facilities
10 C	250.0	S	Gas Governor	WF10	Gas Features	Infrastructure and Facilities
11 C	250.0	S	Gas Governor Station	WF10	Gas Features	Infrastructure and Facilities

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: **0**

Database searched and no data found.

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site: **0**

Database searched and no data found.

4. Geology

4.1 Artificial Ground and Made Ground

The database has been searched on site, including a 50m buffer.

LEX Code	Description	Rock Type
MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
WMGR-MGRD	INFILLED GROUND	ARTIFICIAL DEPOSIT

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

4.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

4.3 Bedrock and Solid Geology

The database has been searched on site, including a 50m buffer.

LEX Code	Description	Rock Type
PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

For more detailed geological and ground stability data please refer to the "GroundSure GeoInsight". Available from our website.

5a. Hydrogeology - Aquifer Within Superficial Geology

NW N NE

W E

SW S SE

Aquifer Within Superficial Geology Legend

- Site Outline
- Search Buffers (m): 250, 500
- Principal Aquifer
- Secondary (A) Aquifer - Permeable Layers
- Secondary (B) Aquifer - Lower Permeability Layers
- Secondary Aquifer - Undifferentiated Layers
- Unproductive
- Unknown (lakes and landslip)

5b. Hydrogeology - Aquifer Within Bedrock Geology and Abstraction Licenses

NW N NE

W E

SW S SE

Aquifer Within Bedrock Geology Legend

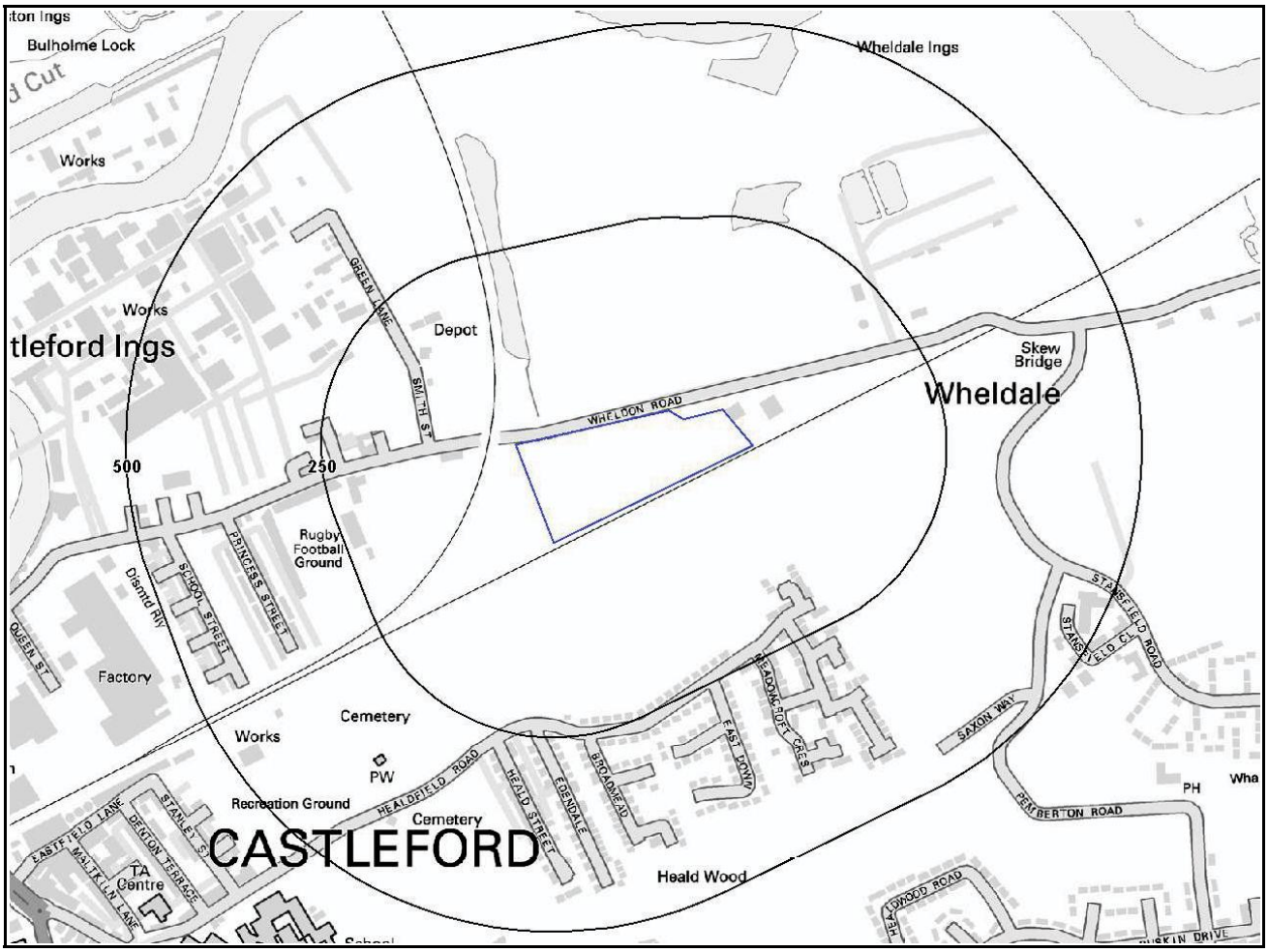
- Site Outline
- Search Buffers (m): 250, 500
- Principal Aquifer
- Secondary (A) Aquifer - Permeable Layers
- Secondary (B) Aquifer - Lower Permeability Layers
- Groundwater Abstraction Licence
- Secondary Aquifer - Undifferentiated Layers
- Unproductive
- Unknown (lakes and landslip)
- Surface Water Abstraction Licence

5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses

NW N NE

W E

SW S SE



SPZ and Potable Water Abstraction Licenses
Legend

Enabled by Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

5d. Hydrology – Detailed River Network and River Quality

NW N NE

W E

SW S SE

Hydrology Legend

Enabled by Ordnance Survey

- Site Outline
- 250 / 500 Search Buffers (m)
- Primary River
- Secondary River
- Tertiary River
- Lake/Reservoir
- Underground River (inferred)
- General Quality Assessment: Chemistry
- Canal
- Canal Tunnel
- Extended Culvert (greater than 50m)
- D/S of High Water Mark
- D/S seaward extension
- General Quality Assessment: Biology

5.Hydrogeology and Hydrology

5.1 Aquifer within Superficial Deposits

Are there records of productive strata within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (5a):

ID	Distance [m]	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	141.0	SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.2 Aquifer within Bedrock Deposits

Are there records of productive strata within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (5b):

ID	Distance [m]	Direction	Designation	Description
3	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
1	350.0	E	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

5.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 1000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance	Direction	NGR	Details

4A	662.0	SW	443300, 425800	Licence No: 2/27/17/038 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Groundwaters Point: Well - Coal Measures - Castleford Data Type: Point	Annual Volume (m³): 144563 Max Daily Volume (m³): 2182 Original Application No: 324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
5A	662.0	SW	443300, 425800	Licence No: 2/27/17/038 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Groundwaters Point: Well - Coal Measures - Castleford Data Type: Point	Annual Volume (m³): 144563 Max Daily Volume (m³): 2182 Original Application No: 324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
6A	662.0	SW	443300, 425800	Licence No: 2/27/17/038 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Groundwaters Point: Well Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
7A	662.0	SW	443300, 425800	Licence No: 2/27/17/038 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Groundwaters Point: Well Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
8B	799.0	SW	443200, 425700	Licence No: 2/27/17/038 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Groundwaters Point: Well - Coal Measures - Castleford Data Type: Point	Annual Volume (m³): 144563 Max Daily Volume (m³): 2182 Original Application No: 324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
9B	799.0	SW	443200, 425700	Licence No: 2/27/17/038 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Groundwaters Point: Well - Coal Measures - Castleford Data Type: Point	Annual Volume (m³): 144563 Max Daily Volume (m³): 2182 Original Application No: 324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
10B	799.0	SW	443200, 425700	Licence No: 2/27/17/038 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Groundwaters Point: Well - Coal Measures - Castleford Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 00324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
11B	799.0	SW	443200, 425700	Licence No: 2/27/17/038 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Groundwaters Point: Well Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 324 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 1000m of the study site? **Yes**

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance	Direction	NGR	Details

12	411.0	N	444100, 426700	Licence No: 2/27/17/226 Details: Dust Suppression Direct Source: Surface Water Point: River Aire - Castleford Data Type: Line	Annual Volume (m³): 9800 Max Daily Volume (m³): 120 Application No: 8307 Original Start Date: 13/6/2008 Expiry Date: 31/12/2009 Issue No: 2 Version Start Date: 12/8/2008 Version End Date:
Not shown	700.0	W	443140, 426340	Licence No: 2/27/17/202 Details: Non-Evaporative Cooling Direct Source: Surface Water Point: River Aire - Weldon Road Castleford Data Type: Point	Annual Volume (m³): 34689600 Max Daily Volume (m³): 103680 Application No: 6866 Original Start Date: 8/4/1998 Expiry Date: 31/12/2020 Issue No: 105 Version Start Date: 13/12/2008 Version End Date:
Not shown	735.0	W	443100, 426300	Licence No: 2/27/17/064 Details: General use relating to Secondary Category (Low Loss) Direct Source: Surface Water Point: River Aire - Hickson Fine Chemicals, Castleford Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 1253 Original Start Date: 20/1/1970 Expiry Date: - Issue No: 102 Version Start Date: 1/6/2000 Version End Date:
Not shown	735.0	W	443100, 426300	Licence No: 2/27/17/064 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Surface Water Point: River Aire Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 1253 Original Start Date: 20/1/1970 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1989 Version End Date:
Not shown	735.0	W	443100, 426300	Licence No: 2/27/17/064 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Surface Water Point: River Aire Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 1253 Original Start Date: 20/1/1970 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1989 Version End Date:
Not shown	735.0	W	443100, 426300	Licence No: 2/27/17/064 Details: General use relating to Secondary Category (Low Loss) Direct Source: Surface Water Point: River Aire Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 1253 Original Start Date: 20/1/1970 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1989 Version End Date:
Not shown	735.0	W	443100, 426300	Licence No: 2/27/17/064 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface Water Point: River Aire - Hickson Fine Chemicals - Castleford Data Type: Point	Annual Volume (m³): 19911000 Max Daily Volume (m³): 54550 Application No: 1253 Original Start Date: 20/1/1970 Expiry Date: - Issue No: 103 Version Start Date: 9/8/2004 Version End Date:
Not shown	735.0	W	443100, 426300	Licence No: 2/27/17/064 Details: General Washing/Process Washing Direct Source: Surface Water Point: River Aire - Hickson Fine Chemicals - Castleford Data Type: Point	Annual Volume (m³): 19911000 Max Daily Volume (m³): 54550 Application No: 1253 Original Start Date: 20/1/1970 Expiry Date: - Issue No: 103 Version Start Date: 9/8/2004 Version End Date:

5.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? **No**

Database searched and no data found.

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? **No**

Database searched and no data found.

5.7 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? **Yes**

Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (5d):

ID	Distance [m]	Direction	NGR	River Details	Biological Quality Grade				
					2005	2006	2007	2008	2009
Not shown	684.0	NW	443447, 426809	River Name: Aire Reach: Lin Dike Fairburn Ings End/Start of Stretch: Start of Stretch NGR	D	D	E	E	E
Not shown	684.0	NW	443447, 426809	River Name: Aire Reach: River Calder Lin Dike End/Start of Stretch: End of Stretch NGR	D	D	E	E	E
Not shown	1469.0	W	442366, 426318	River Name: Aire Reach: River Calder Lin Dike End/Start of Stretch: Start of Stretch NGR	D	D	E	E	E

Chemical Quality:

Database searched and no data found.

5.8 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? **No**

Database searched and no data found.

5.9 Surface Water Features

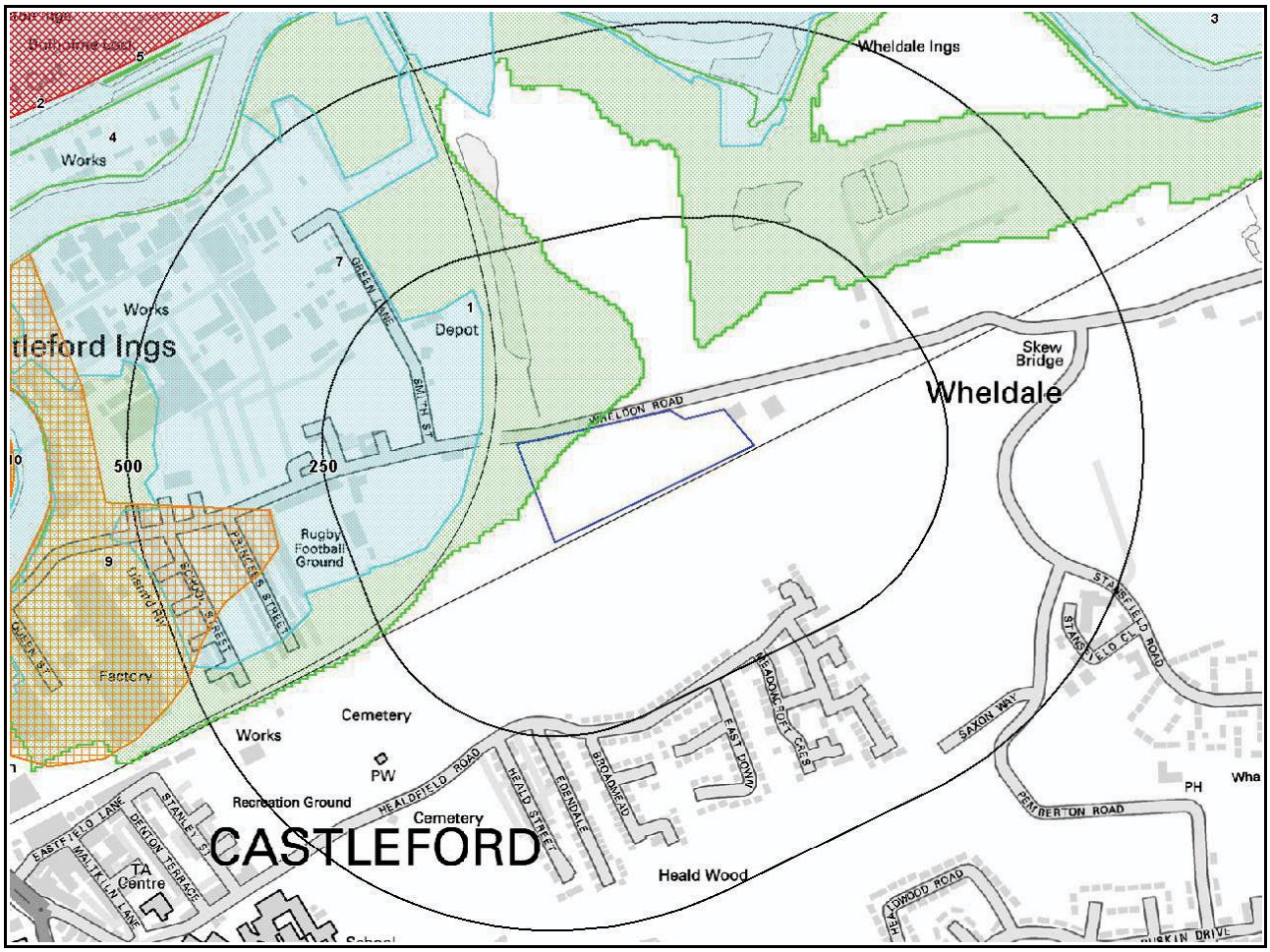
Are there any surface water features within 250m of the study site? **Yes**

The following surface water records are not represented on mapping:

Distance to Surface Water (m)	on-site	0-50	51-250
Surface water features within 250m of the study site	No	Yes	Yes

6. Environment Agency Flood Map

NW ▲ N NE



◄W E►

SW ▼ S SE

Environment Agency Flood Legend

Enabled by Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Zone 2 Floodplain

Zone 3 Floodplain

Flood Storage Area

Area Benefiting from Flood Defences

Flood Defences

6. Flooding

6.1 Zone 2 Flooding

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain? **Yes**

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance	Direction	Update	Type
1	0.0	On Site	01-Nov-2011	Zone 2 - (Fluvial Models)

6.2 Zone 3 Flooding

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 3 floodplain? **Yes**

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance	Direction	Update	Type
7	51.0	W	01-Nov-2011	Zone 3 - (Fluvial Models)

6.3 Flood Defences

Are there any Flood Defences within 250m of the study site? **No**

6.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? **No**

6.5 Areas used for Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? **No**

6.6 Groundwater Flooding Susceptibility Areas

Are there any British Geological Survey groundwater flooding susceptibility flood areas within 50m of the boundary of the study site? **Yes**

What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?	**Very High**

6.7 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result?	**High**

Notes:

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The **confidence rating** is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

7.Designated Environmentally Sensitive Sites Map

NW N NE

◄W E►

SW S SE

Designated Environmentally Sensitive Sites Legend

Enabled by Ordnance Survey

- Site Outline
- Search Buffers (m) 250 500
- SAC
- SSSI
- NNR
- World Heritage Sites
- SPA
- Ramsar
- LNR
- Environmentally Sensitive Areas
- Areas of Outstanding Natural Beauty
- Nitrate Sensitive Areas
- National Parks

7.Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 500m of the study site? **No**

Records of Sites of Special Scientific Interest (SSSI) within 500m of the study site: **0**

Database searched and no data found.

Records of National Nature Reserves (NNR) within 500m of the study site: **0**

Database searched and no data found.

Records of Special Areas of Conservation (SAC) within 500m of the study site: **0**

Database searched and no data found.

Records of Special Protection Areas (SPA) within 500m of the study site: **0**

Database searched and no data found.

Records of Ramsar sites within 500m of the study site: **0**

Database searched and no data found.

Records of Local Nature Reserves (LNR) within 500m of the study site: **0**

Database searched and no data found.

Records of World Heritage Sites within 500m of the study site: **0**

Database searched and no data found.

Records of Environmentally Sensitive Areas within 500m of the study site: **0**

Database searched and no data found.

Records of Areas of Outstanding Natural Beauty (AONB) within 500m of the study site: **0**

Database searched and no data found.

Records of National Parks (NP) within 500m of the study site: **0**

Database searched and no data found.

Records of Nitrate Sensitive Areas within 500m of the study site: **0**

Database searched and no data found.

Records of Nitrate Vulnerable Zones within 500m of the study site: **0**

Database searched and no data found.

8. Natural Hazards Findings

8.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a GroundSure GeoInsight, available from our website. The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? **Null - Negligible**

Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? **Moderate**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property poss ible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

8.1.6Running Sand

What is the maximum Running Sand* hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* This indicates an automatically generated 50m buffer and site.

9.Mining

9.1 Coal Mining

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

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*? **Low-Moderate**

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? **No**

Database searched and no data found.

APPENDIX B

Historical Maps

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: MasterMap

Map date: **2011**

Scale: 1:2,500

Printed at: 1:2,500

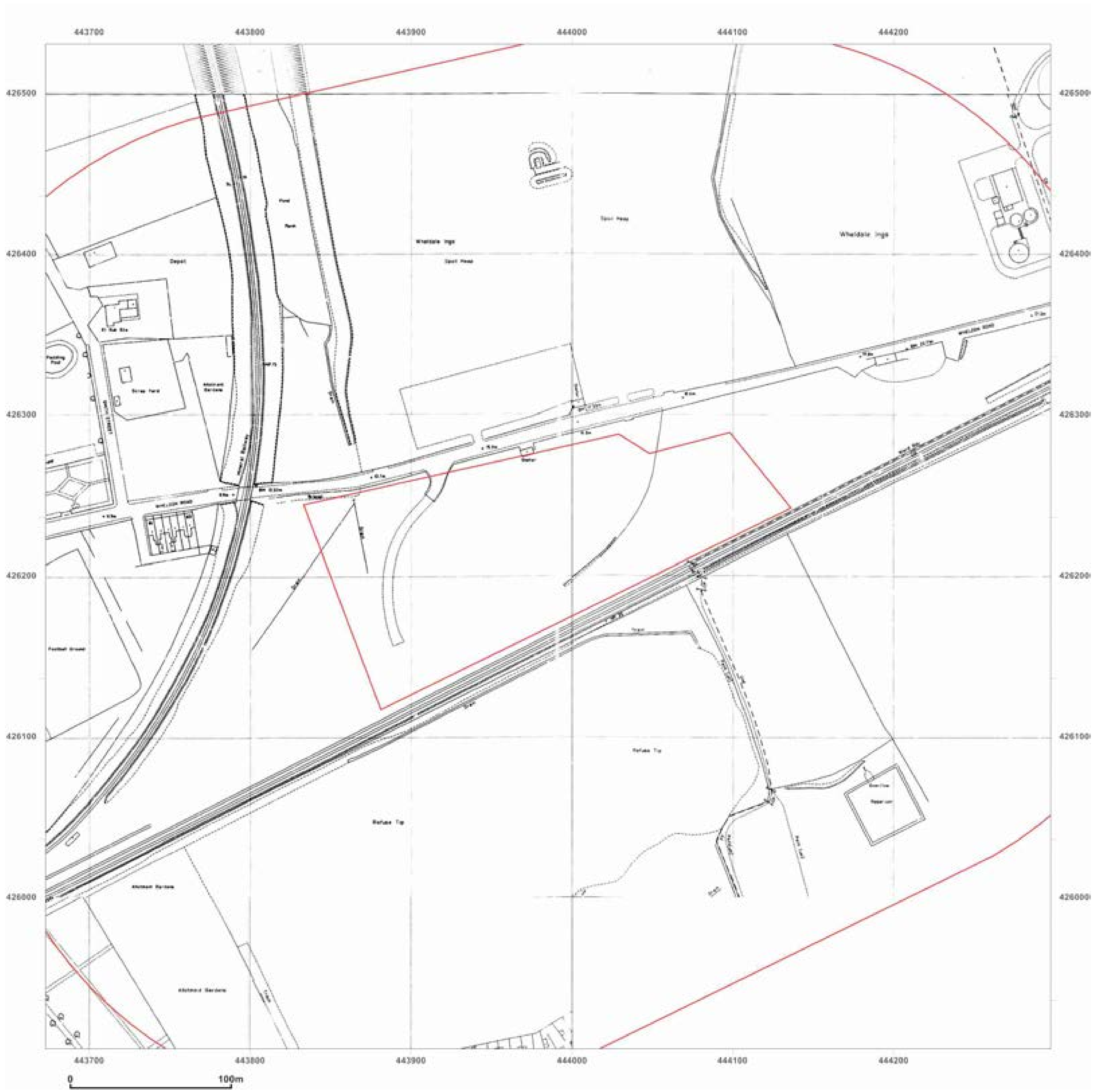
2011

Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

Production date: 06 January 2012

To view map legend click here *Legend*



![emapsite™]

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1991-1995**

Scale: 1:1,250

Printed at: 1:2,500

N
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Surveyed 1963
Revised 1991
Edition N/A
Copyright 1991
Levelled 1963

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1991
Levelled 1963

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

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

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A

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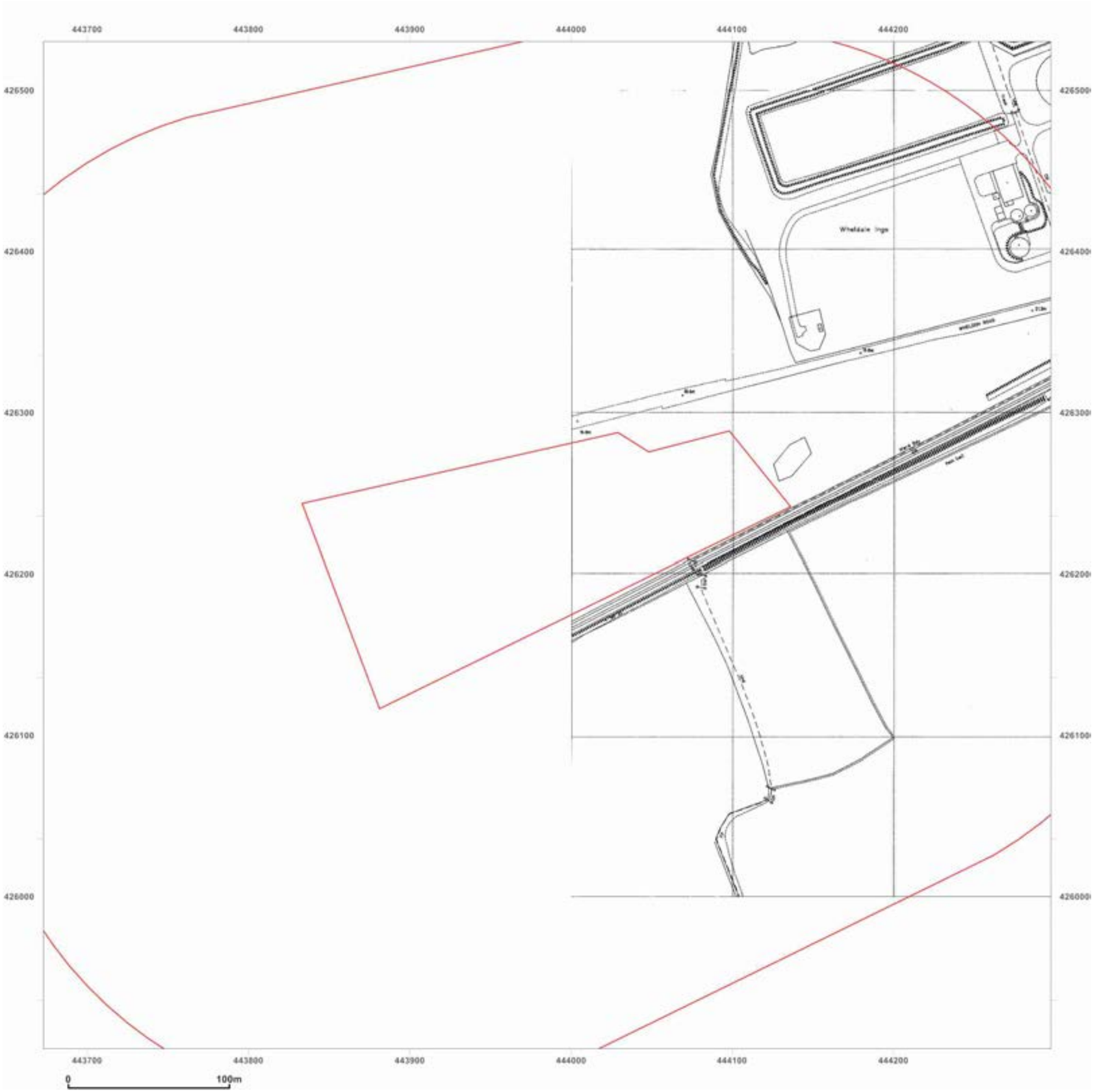
sales@emapsite.com

Production date: 06 January 2012

To view map legend click here *Legend*



emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,500

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Production date: 06 January 2012

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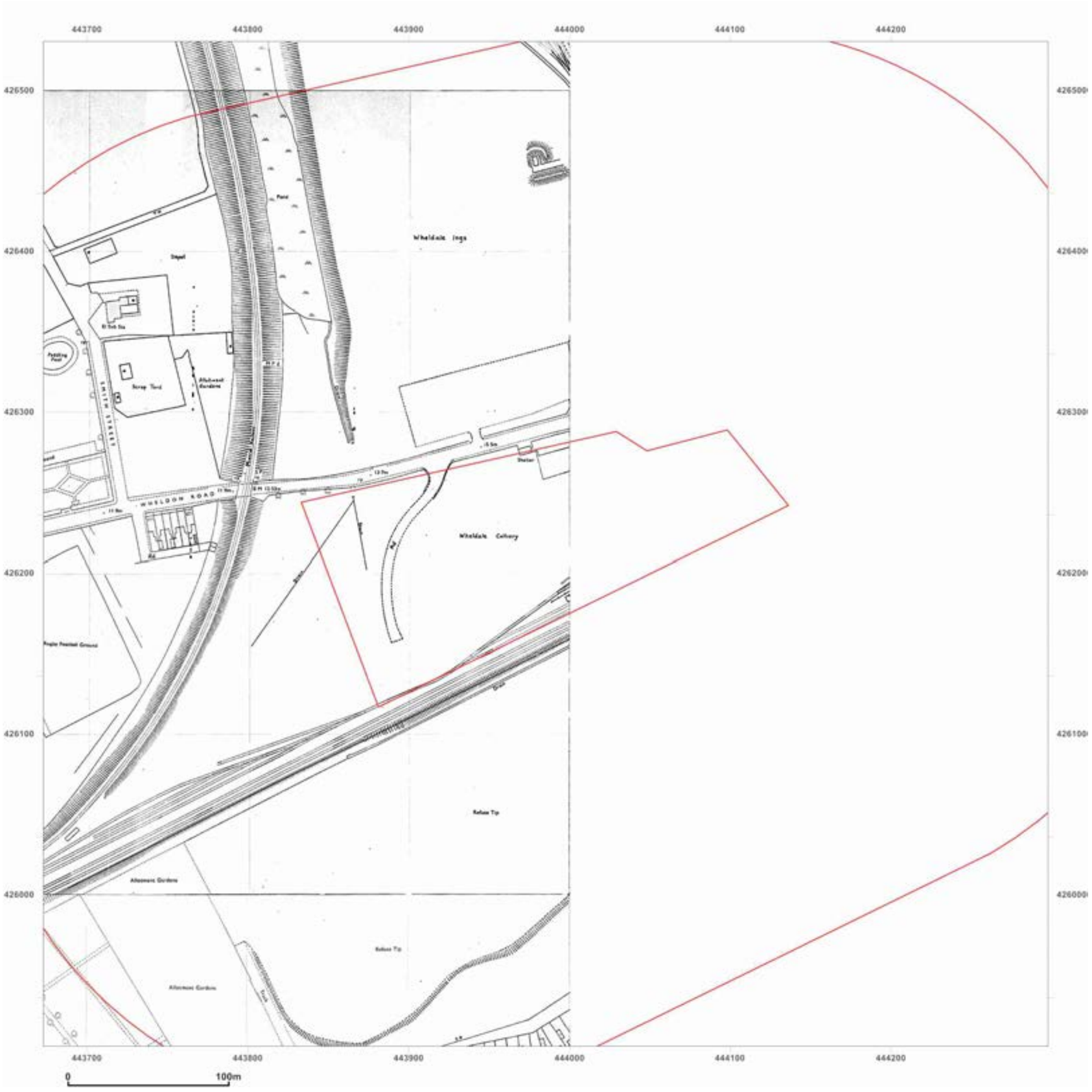

emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1981-1985**

Scale: 1:1,250

Printed at: 1:2,500

N
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Surveyed 1963
Revised 1985
Edition N/A
Copyright 1985
Levelled 1963

Surveyed 1963
Revised 1985
Edition N/A
Copyright 1985
Levelled 1963

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1981
Levelled 1963

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Production date: 06 January 2012

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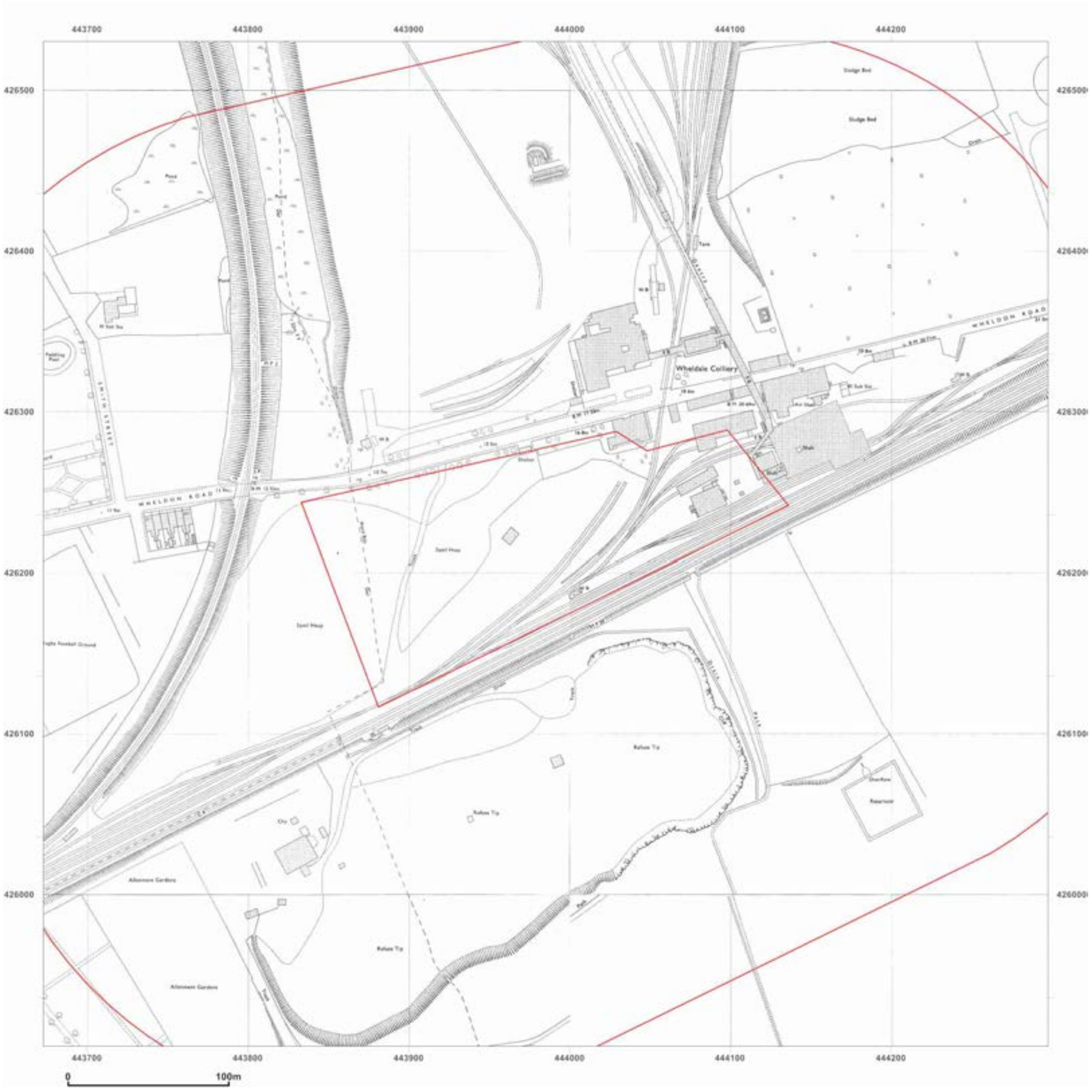

emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1971-1972**

Scale: 1:1,250

Printed at: 1:2,500

N
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Surveyed 1952
Revised 1971
Edition N/A
Copyright 1972
Levelled 1963

Surveyed 1952
Revised 1972
Edition N/A
Copyright 1972
Levelled 1963

Surveyed 1952
Revised 1971
Edition N/A
Copyright 1972
Levelled 1963

Surveyed 1952
Revised 1972
Edition N/A
Copyright 1972
Levelled 1963

Surveyed 1952
Revised 1971
Edition N/A
Copyright 1971
Levelled 1963

Surveyed 1952
Revised 1970
Edition N/A
Copyright 1971
Levelled 1963

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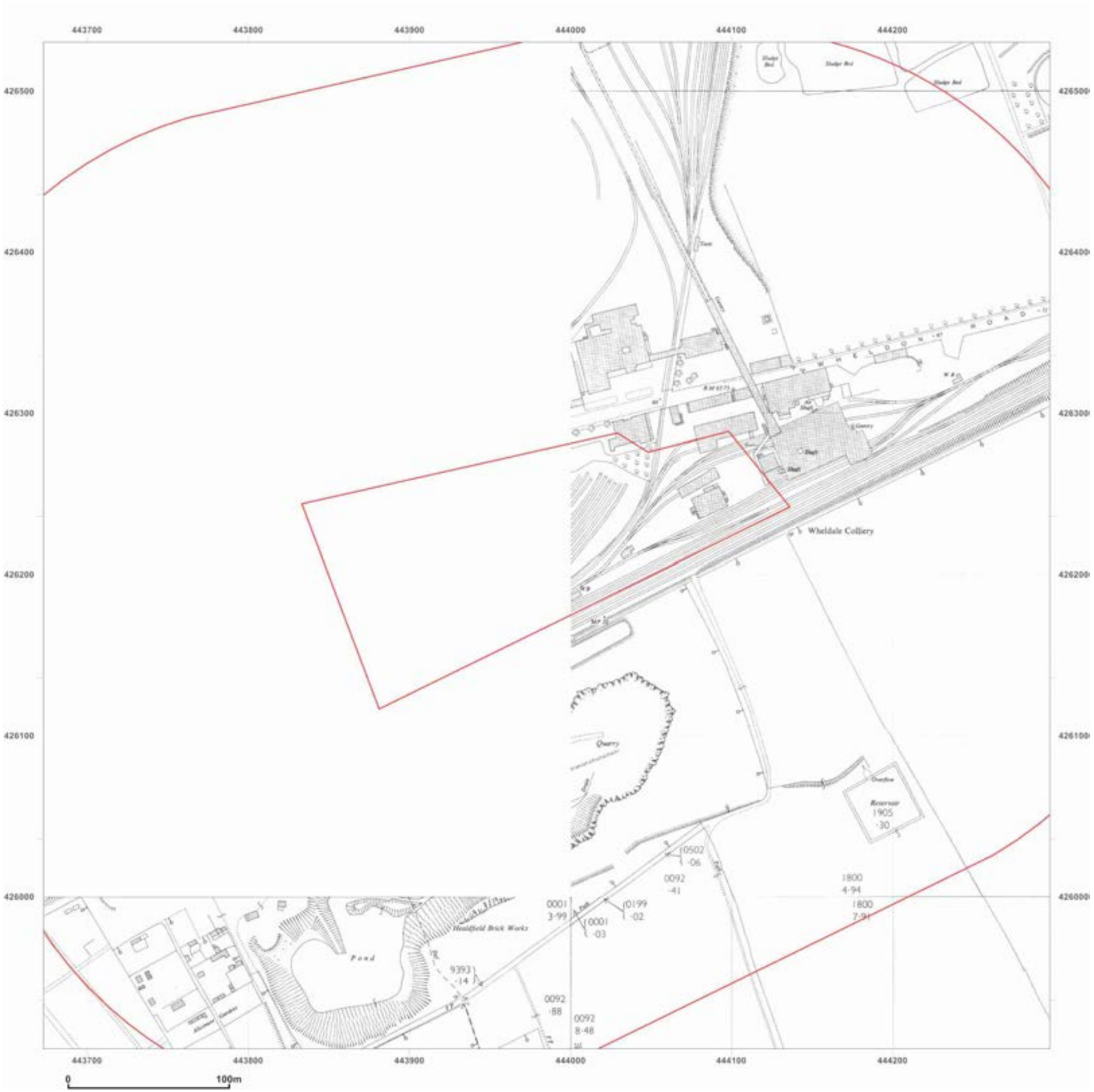

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1961-1965**

Scale: 1:2,500

Printed at: 1:2,500

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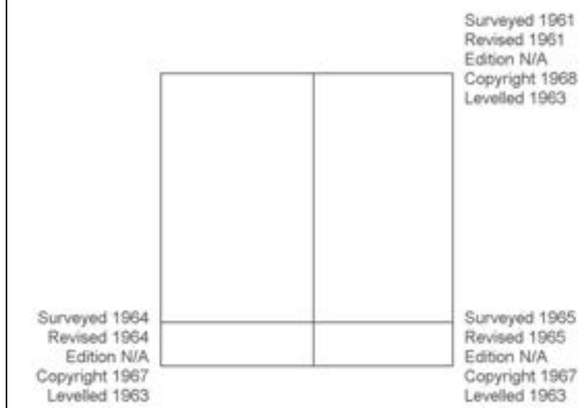

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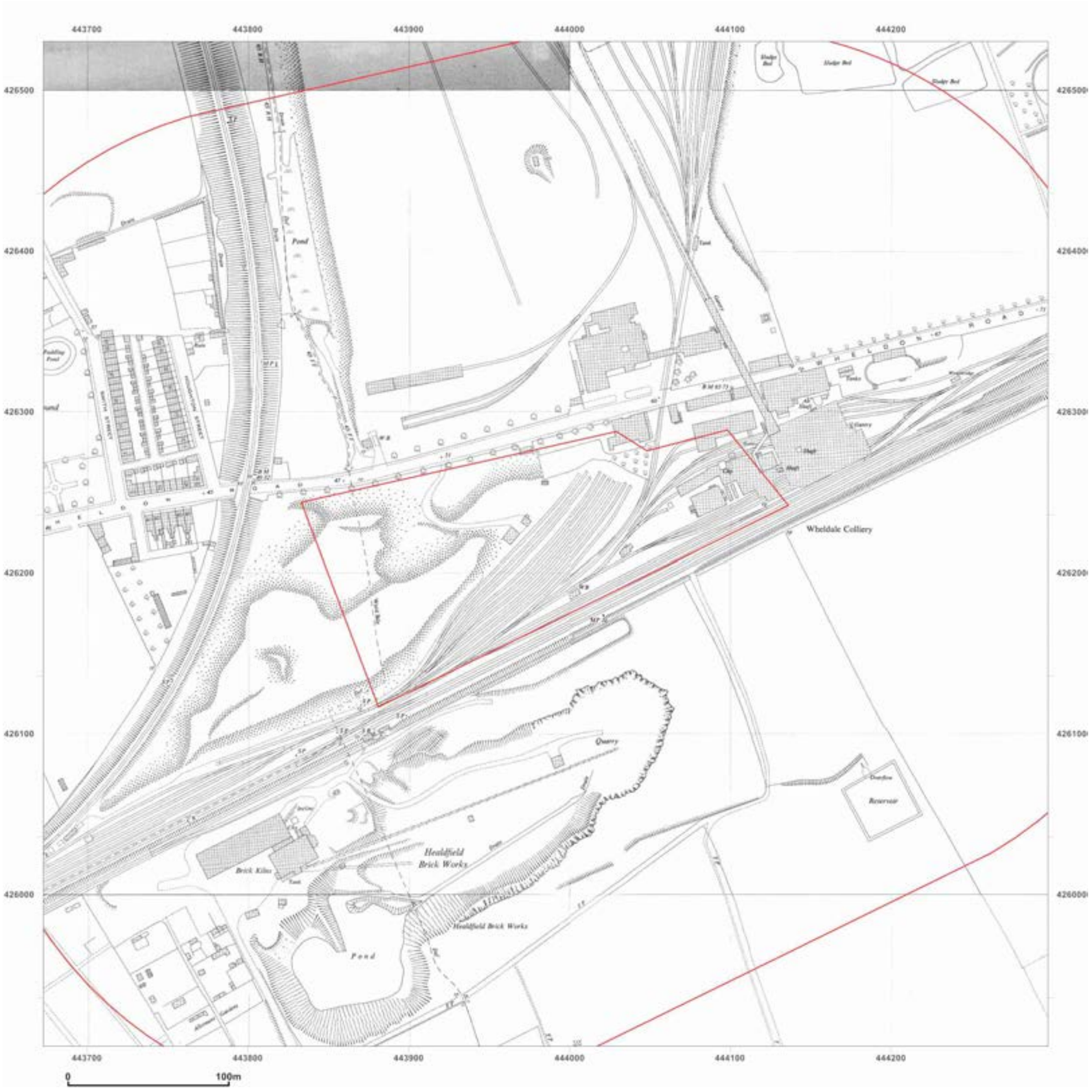

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,500

N
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Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1929

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1929

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1929

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1929

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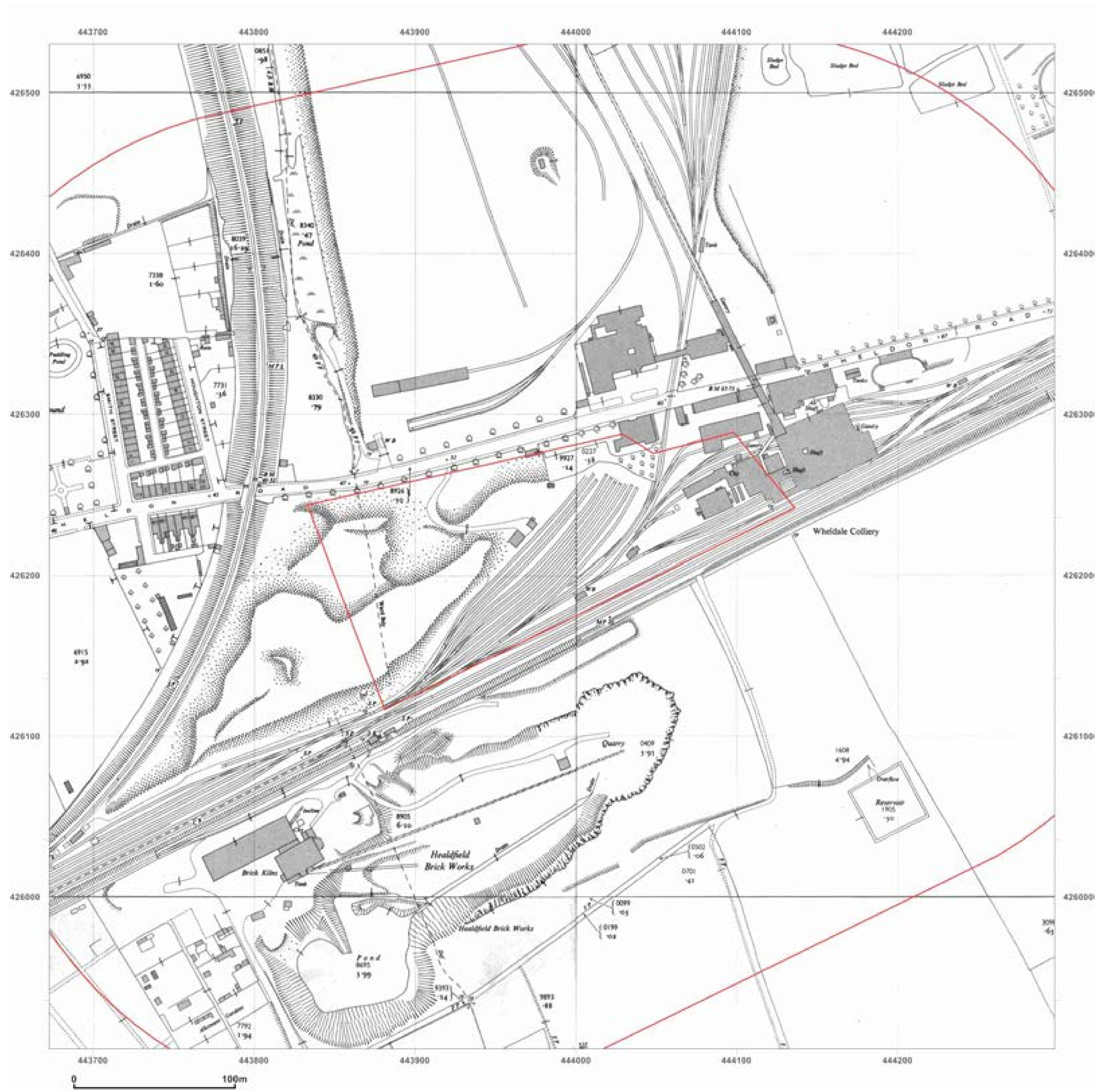

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1952**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1952
Revised 1952
Edition 1954
Copyright N/A
Levelled 1929

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1929

Surveyed 1952
Revised 1952
Edition 1954
Copyright N/A
Levelled 1929

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1929

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Production date: 06 January 2012

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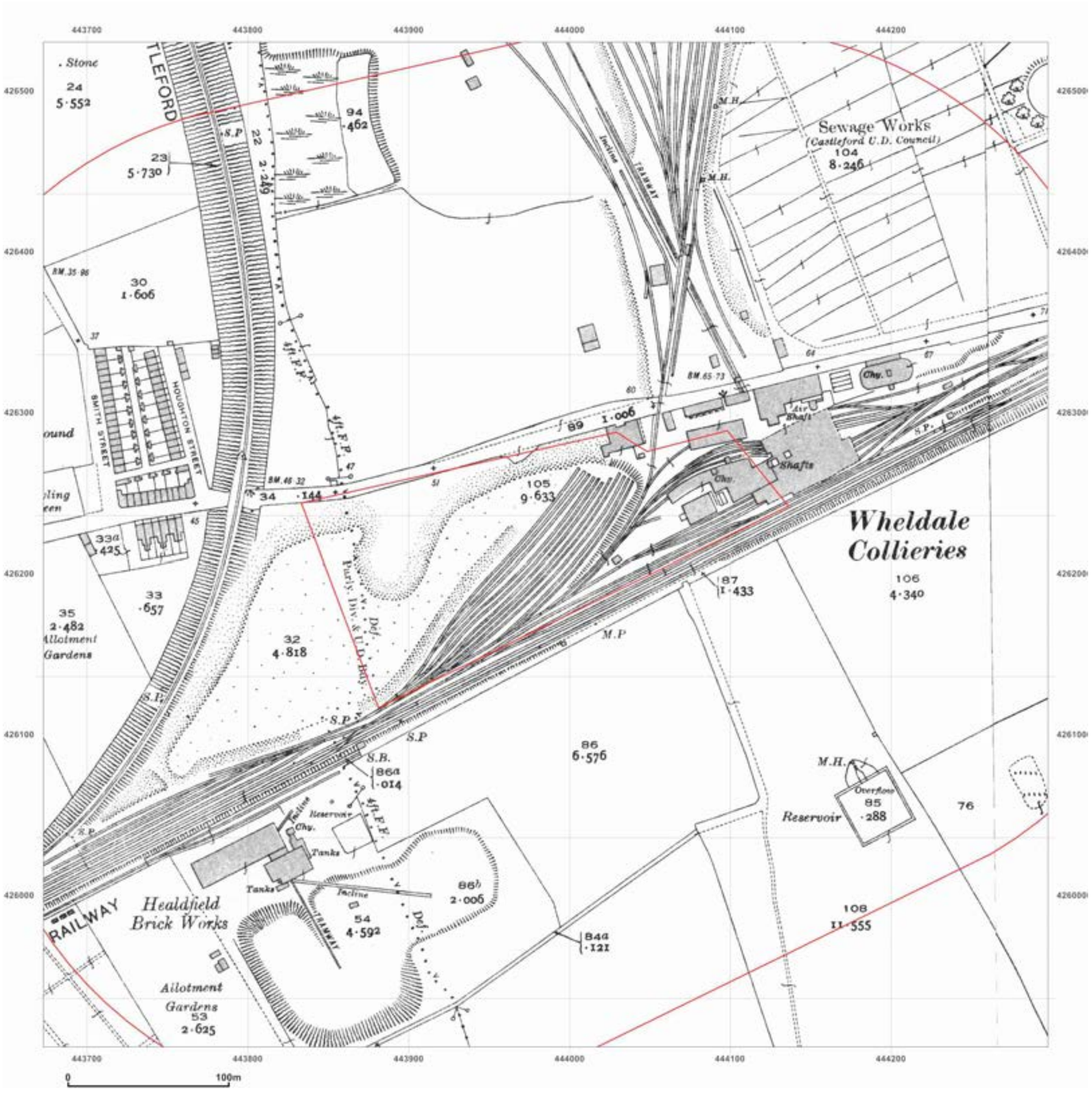

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: County Series

Map date: **1933**

Scale: 1:2,500

Printed at: 1:2,500

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Production date: 06 January 2012

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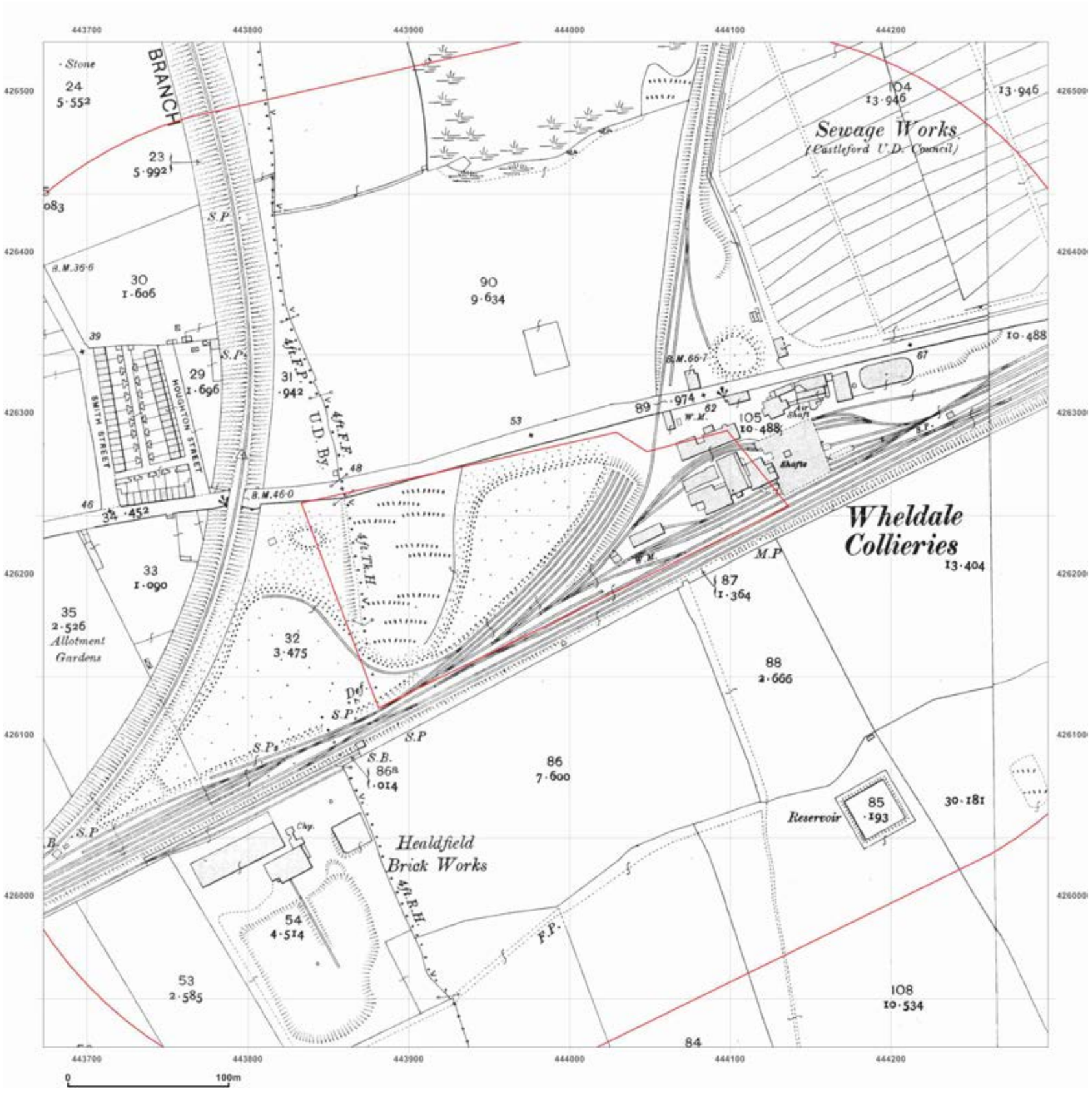

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: County Series

Map date: **1908**

Scale: 1:2,500

Printed at: 1:2,500

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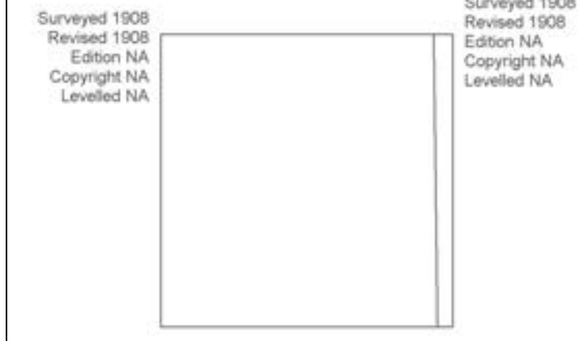

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Production date: 06 January 2012

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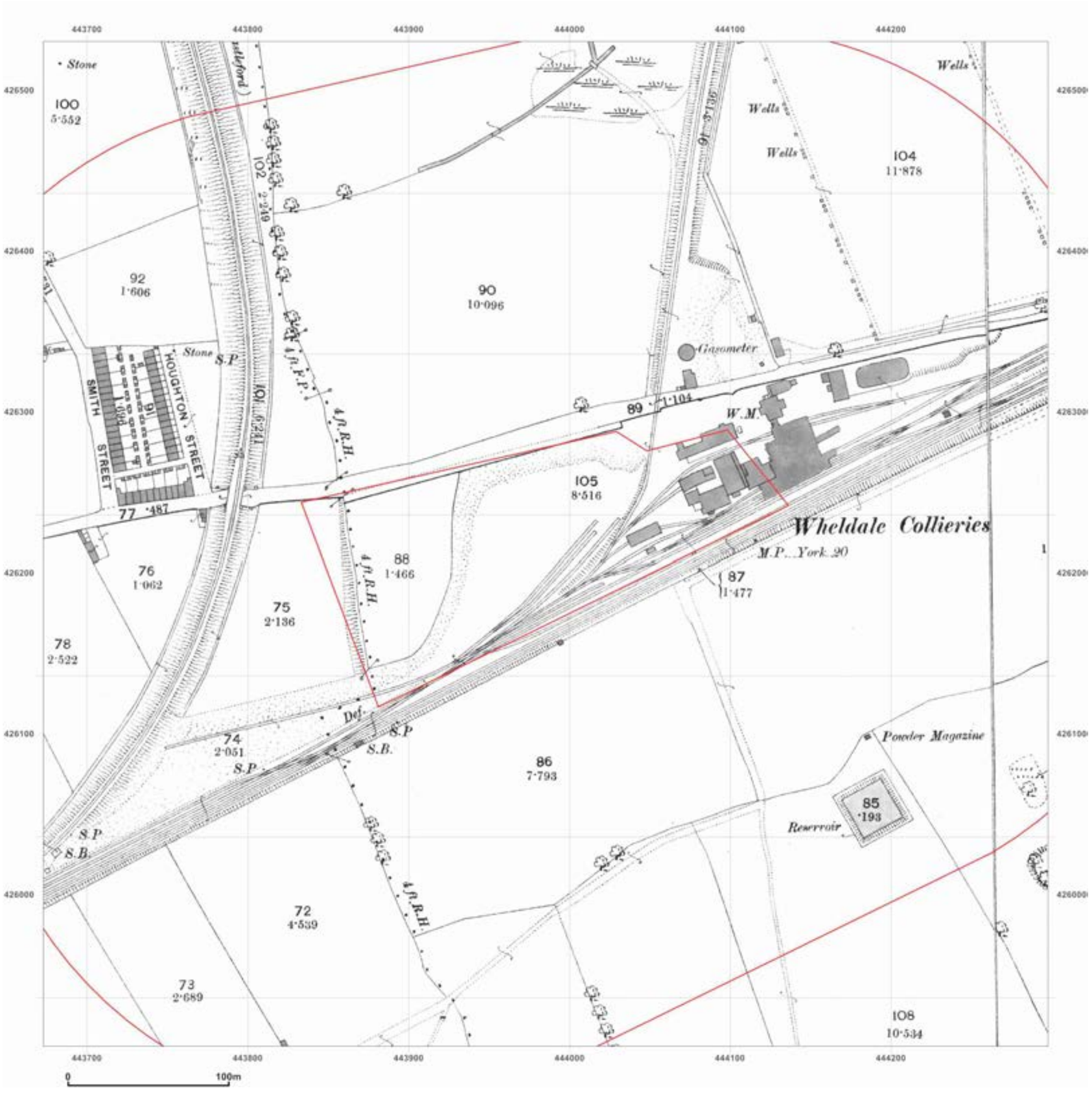

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: County Series

Map date: **1892**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1892
Revised 1892
Edition NA
Copyright NA
Levelled NA

Surveyed 1892
Revised 1892
Edition NA
Copyright NA
Levelled NA

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Production date: 06 January 2012

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **2011**

Scale: 1:10,000

Printed at: 1:10,000

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2011

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Production date: 06 January 2012

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

N
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2002

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Production date: 06 January 2012

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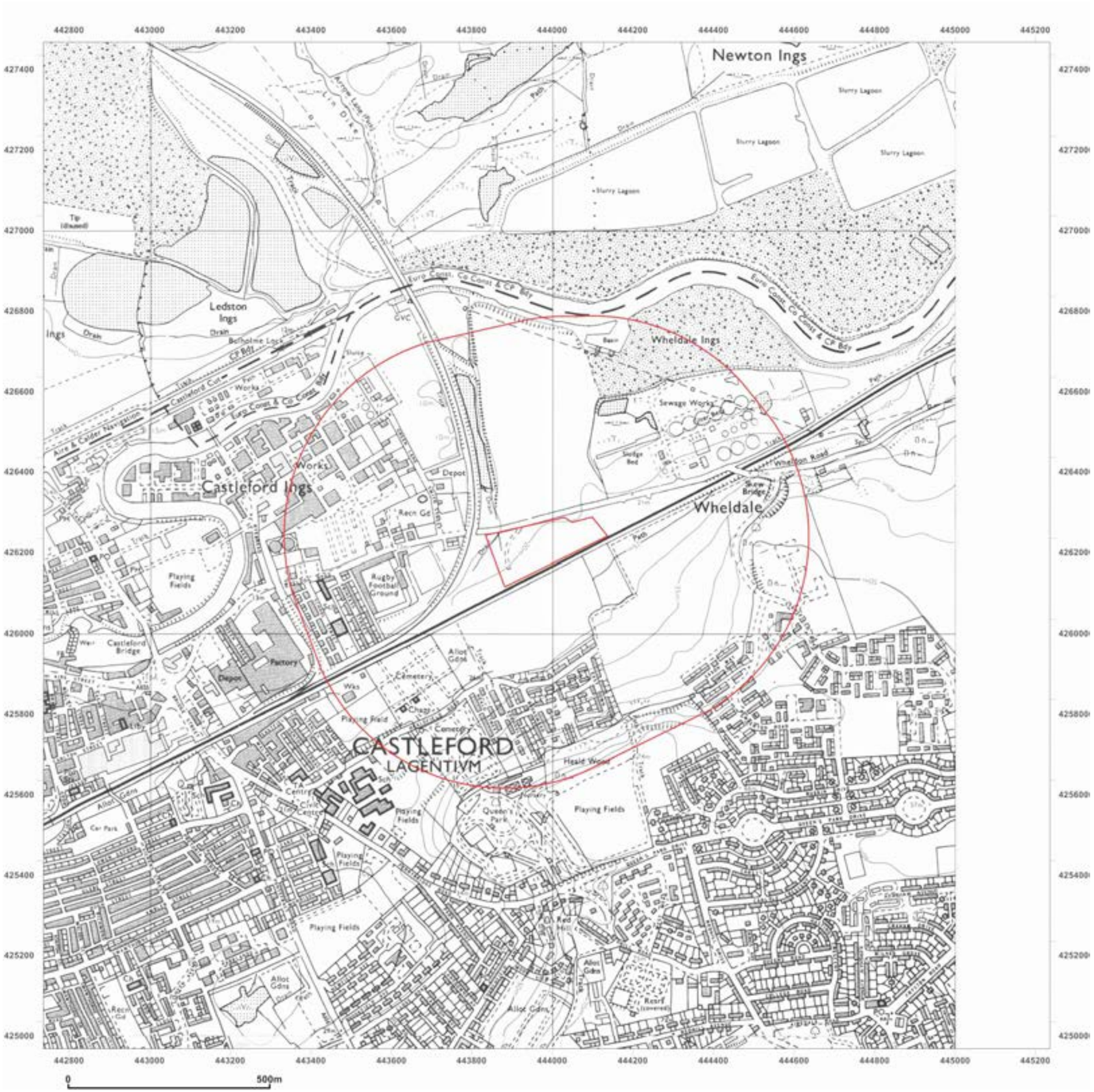

emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1992-1995**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1981
Revised 1995
Edition NA
Copyright NA
Levelled NA

Surveyed 1980
Revised 1992
Edition NA
Copyright NA
Levelled NA

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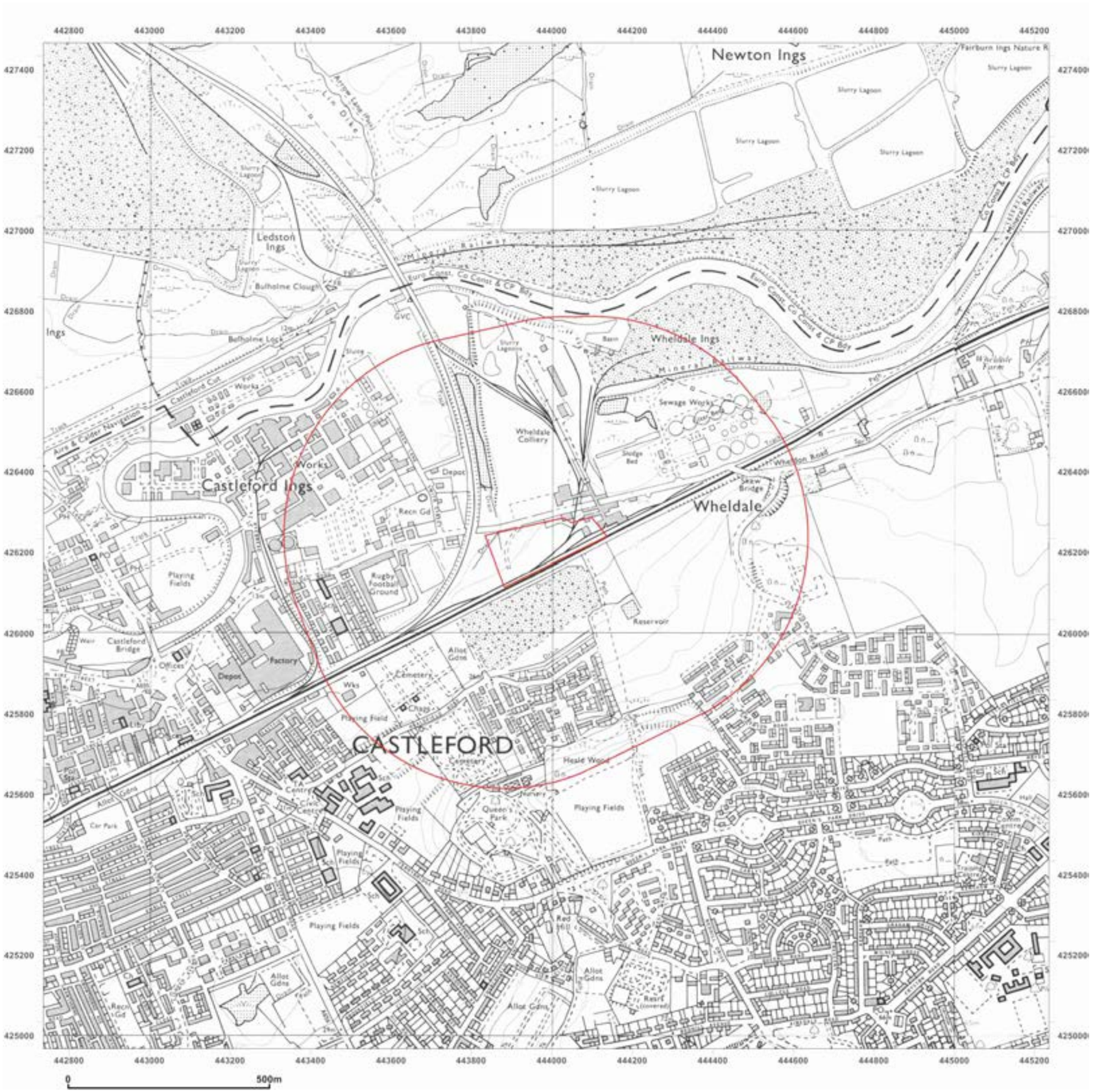
Production date: 06 January 2012

To view map legend click here *Legend*



emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: National Grid

Map date: **1981-1982**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1981
Revised 1981
Edition NA
Copyright NA
Levelled NA

Surveyed 1981
Revised 1982
Edition NA
Copyright NA
Levelled NA

Surveyed 1980
Revised 1981
Edition NA
Copyright NA
Levelled NA

Surveyed 1981
Revised 1982
Edition NA
Copyright NA
Levelled NA

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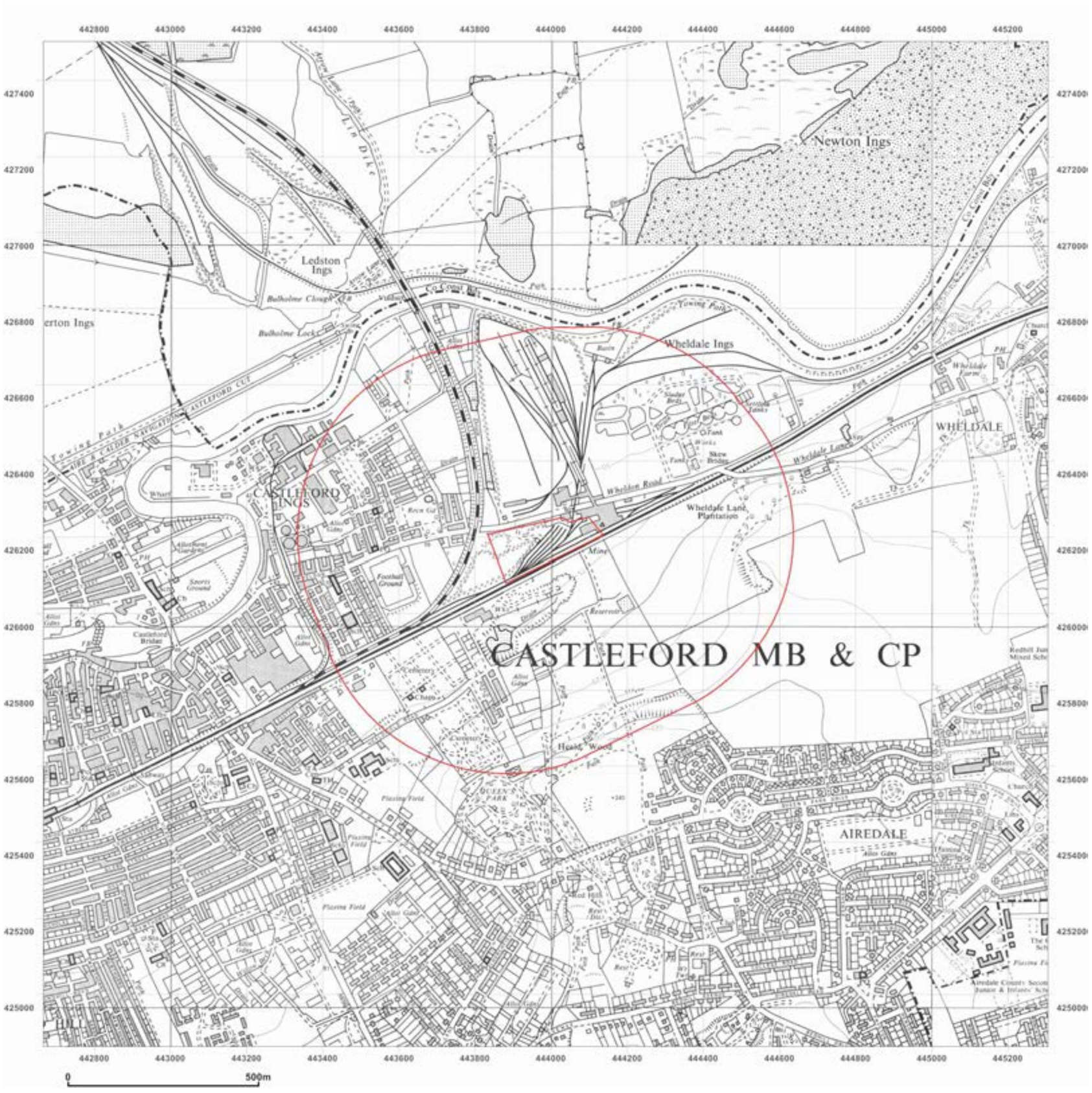
Production date: 06 January 2012

To view map legend click here *Legend*



emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: Provisional

Map date: **1967-1969**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1968
Revised 1968
Edition NA
Copyright NA
Levelled NA

Surveyed 1967
Revised 1967
Edition NA
Copyright NA
Levelled NA

Surveyed 1969
Revised 1969
Edition NA
Copyright NA
Levelled NA

Surveyed 1968
Revised 1968
Edition NA
Copyright NA
Levelled NA

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Supplied by:
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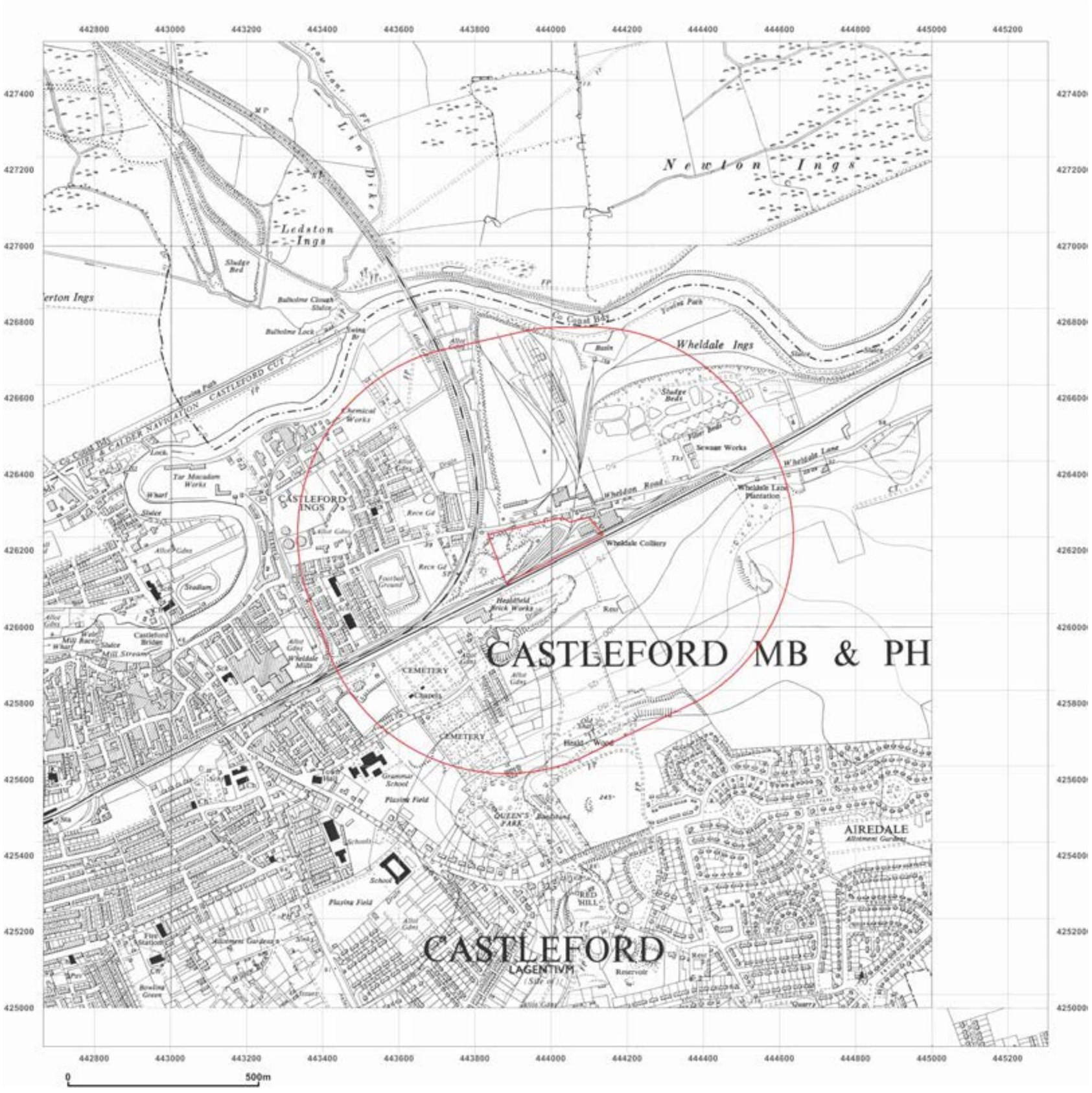
sales@emapsite.com

Production date: 06 January 2012

To view map legend click here *Legend*



emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: Provisional

Map date: **1950**

Scale: 1:10,560

Printed at: 1:10,560

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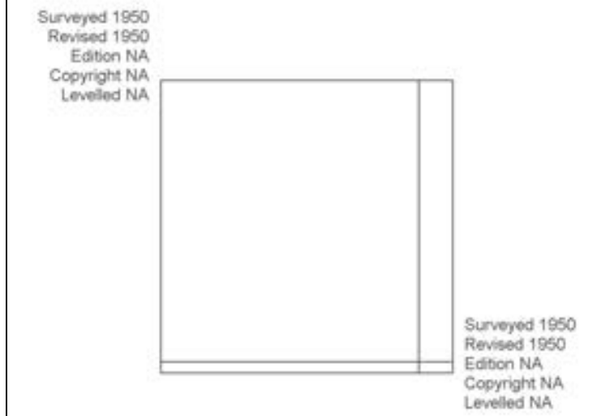

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Supplied by:
www.emapsite.com
sales@emapsite.com

Production date: 06 January 2012

To view map legend click here *Legend*

emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: Provisional

Map date: **1940**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1940
Revised 1940
Edition NA
Copyright NA
Levelled NA

Surveyed 1940
Revised 1940
Edition NA
Copyright NA
Levelled NA

Surveyed 1940
Revised 1940
Edition NA
Copyright NA
Levelled NA

Surveyed 1940
Revised 1940
Edition NA
Copyright NA
Levelled NA

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www.groundsure.com

Supplied by:
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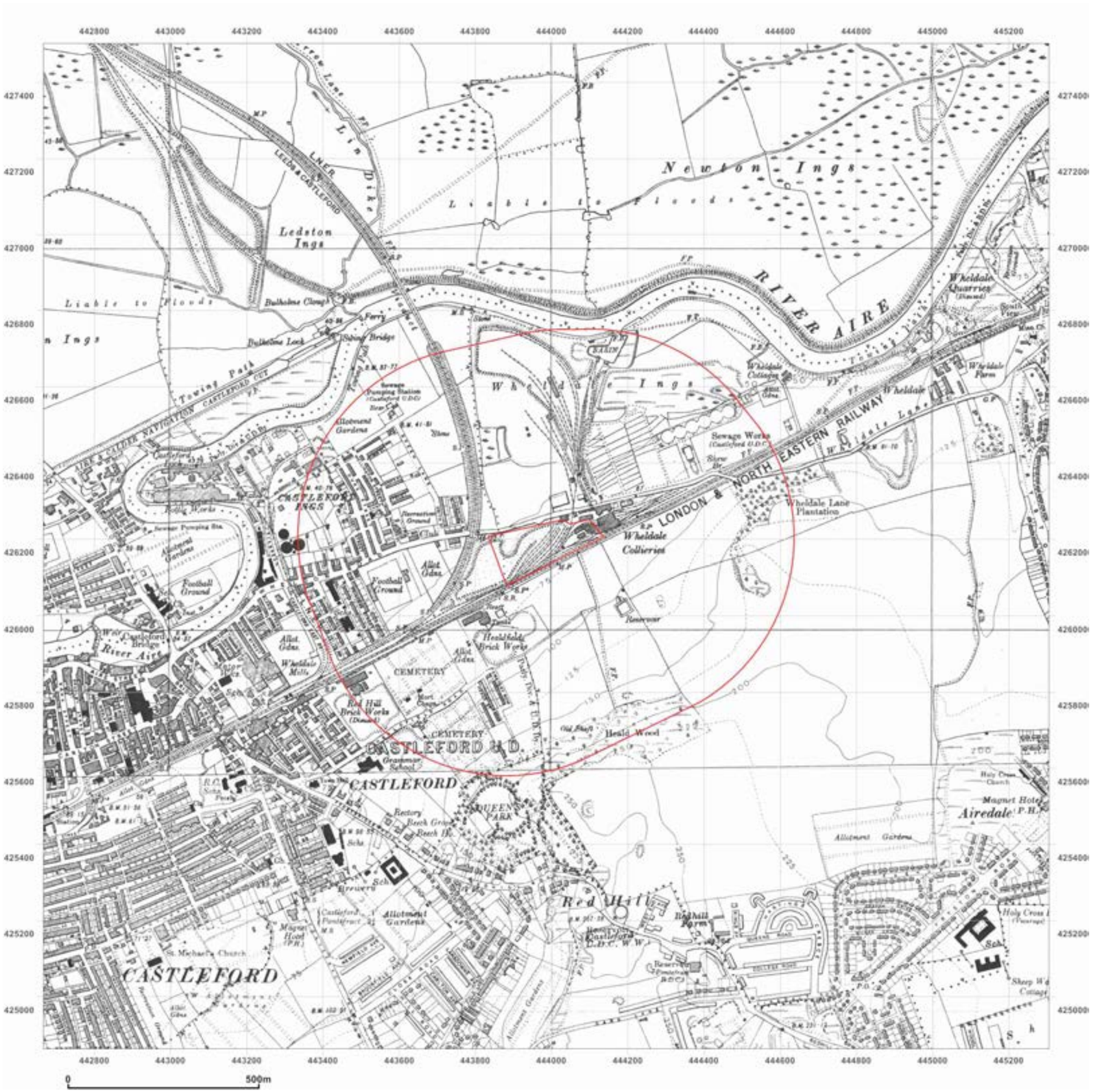
Production date: 06 January 2012

To view map legend click here *Legend*



emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1848
Revised 1938
Edition NA
Copyright NA
Levelled NA

Surveyed 1849
Revised 1938
Edition NA
Copyright NA
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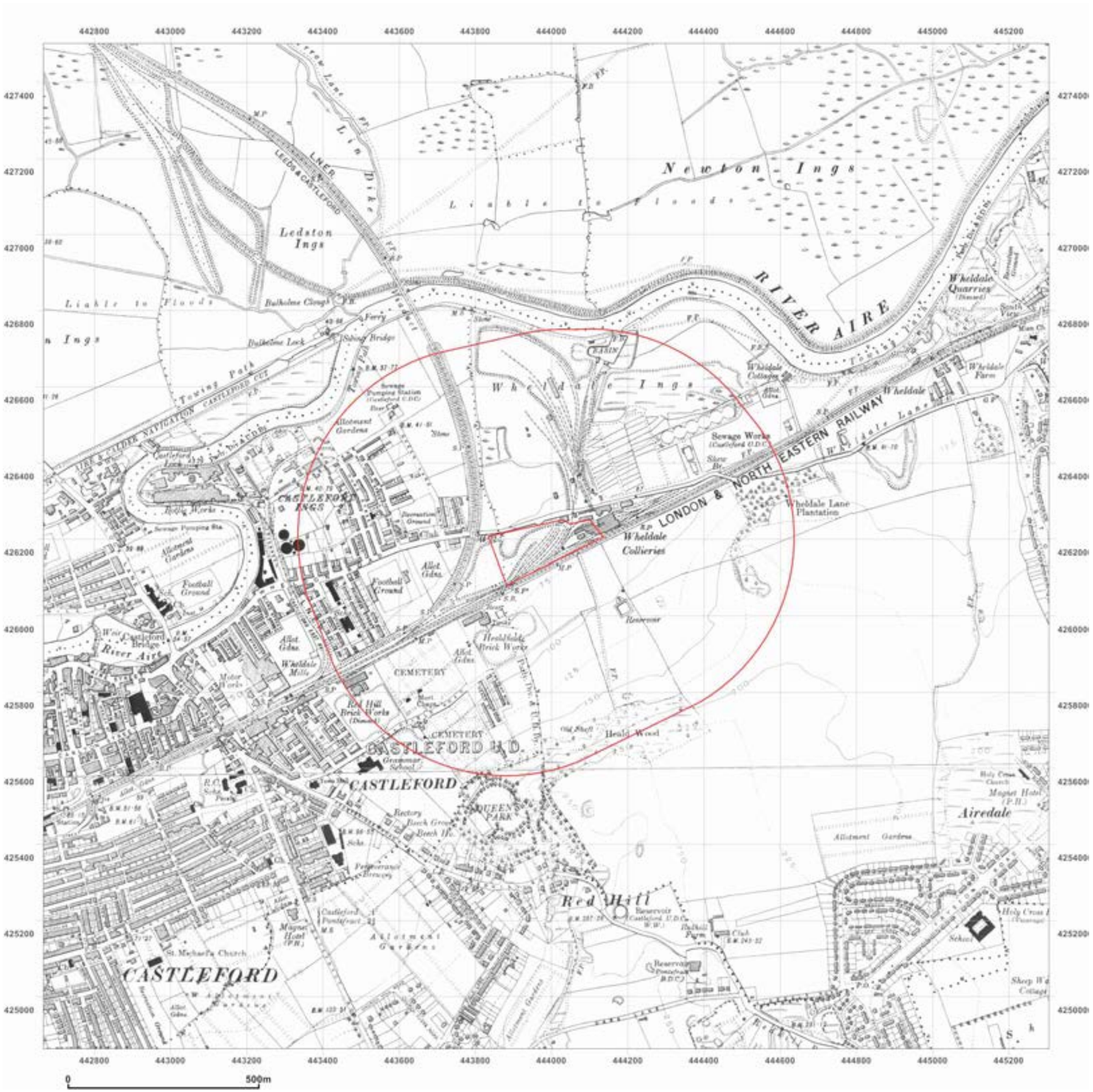
To view map legend click here *Legend*



emapsite™

Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: County Series

Map date: **1932**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1848
Revised 1932
Edition NA
Copyright NA
Levelled NA

Surveyed 1849
Revised 1932
Edition NA
Copyright NA
Levelled NA

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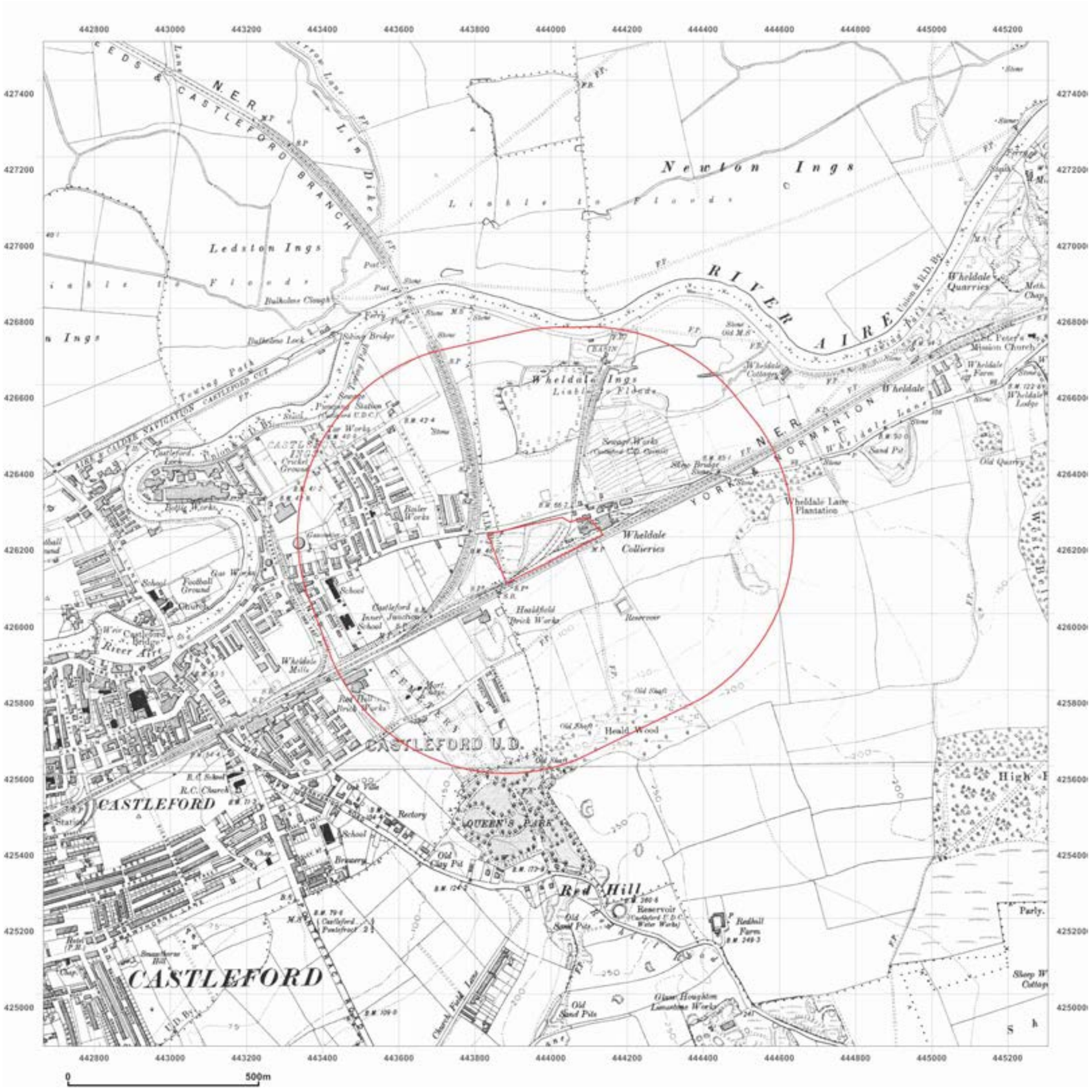

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: County Series

Map date: **1905**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1890
Revised 1905
Edition NA
Copyright NA
Levelled NA

Surveyed 1889
Revised 1905
Edition NA
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Production date: 06 January 2012

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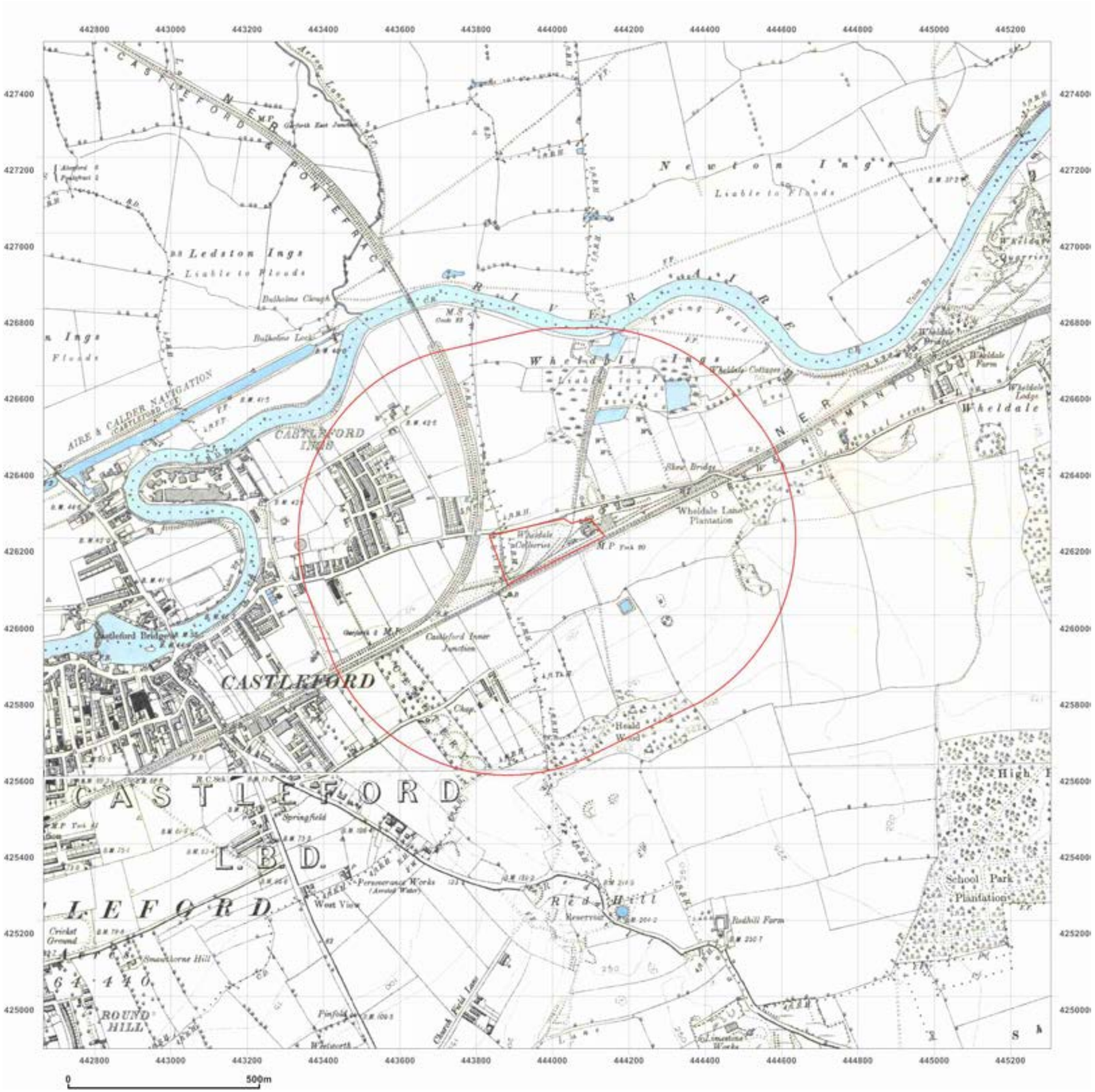

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Site Details:

Allerton Bywater

Client Ref: EMS_149284_215260
Report Ref: EMS-149284_215260
Grid Ref: 443985, 426218

Map Name: County Series

Map date: **1890**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1890
Revised 1890
Edition NA
Copyright NA
Levelled NA

Surveyed 1890
Revised 1890
Edition NA
Copyright NA
Levelled NA

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Production date: 06 January 2012

To view map legend click here *Legend*

APPENDIX C

Local Authority Environmental Search

Our ref:	CL/00011484
Your ref:	SITE NEAR ALLERTON BYWATER
Please reply to:	Dr S J Atkin
Telephone No:	01924 306929
Email Address:	satkin@wakefield.gov.uk

28th February 2012

Ms A Clarke
Pellfrischmann
George House
George Street
WAKEFIELD
WF1 1LY

Dear Alexandra

LAND QUALITY INFORMATION REQUEST FOR LAND AT WHELDALE, CASTLEFORD.

I refer to your email of the 3rd February 2012 regarding a "site near Allerton Bywater". Your plan relating to the site actually shows a site on Wheldon Road, Wheldale, Castleford so I have investigated that site. You also didn't specify which aspects of contaminated land you were interested in so I have answered the questions typically asked.

As requested I have searched our files for information on your site of interest.

- As you can see on the attached plan there are several known closed landfill sites in your area of interest.
  Your site is actually on a former landfill, L99 Wheldale Fryston Colliery Reclamation Site. This was a reclamation project which used inert excavation waste and uncontaminated earth in the 1990s. It should not give rise to any landfill gases.
  L4 Hickson & Welch. 390m away. This industrial site took black oxides of iron, tarry residues, building and general rubbish and incinerator ash from 1977 to 1993.
  L128 Hickson & Welch. 220m away. This industrial site took unspecified chemical, domestic and commercial waste until 1993.
  L75 Smith Street. 130m away. This site took construction and excavation waste in the early 1990s.

L5 Healdfield Quarry. 20m away across the railway. This site took various wastes, including household, until 1994. A venting trench has been constructed near properties to cut off migrating gas.
L58 Castleford High School. 400m away. This site probably took domestic waste for Castleford MBC in the 1960s. Little landfill gas was ever found on site during investigations in the 1990s.
L83 Castleford Holder Station. 510m away. This was filled with demolition and construction waste in 1987 before being tarmacced over to form a car park.

Licensed sites come under the jurisdiction of the Environment Agency but we are aware of one in your area of interest.
L127 Hickson & Welch. 450m away. This site is licensed to take demolition, construction and chemical waste.

- Your site is one which in accordance with the Council's adopted Stategy for Contaminated Land Inspection would be subject in due course of investigation as potentially contaminated land within the meaning of the Environmental Protection Act 1990, Part IIA. The grounds for this are as follows:
    - The spreading of tipped material
    - The site is bounded to the south by existing railway land
    - The land to the west is occupied by a landfill gas engine generating plant
    - There is, and has been for a long time, a sewage works across the road to the north east of the site
    - There is a large, historic, unremediated chemical works site to the north west
    - There are several scrap yards within the curtilage of the chemical works site
    - There is a former brickworks site which has been land-filled just over the railway to the south.

  The land may potentially be affected by contamination from such land uses. Should the proposed land use change, particularly to a more sensitive use such as residential housing, it is likely that the council will require a site investigation to be undertaken to determine the nature and extent of any contamination, if present.

- There are no LAAPC processes in your area of interest
  There are no known Part A Processes in this area but these would come under the jurisdiction of the Environment Agency.

- We are not aware of any complaints or prosecutions against your site or surrounding properties except minor ones relating to fly tipping. We are not aware of any spillages or other incidents on site or in the surrounding area but this would probably come under the jurisdiction of the Environment Agency.

This site was the subject of a planning application in 2006. The documentation contains an extensive site report which may be of interest to you. It is available on the Council website at https://planning.wakefield.gov.uk/online-applications// The application was 06/01997/OUT and it is the first document on page one of "associated documents" Miscellaneous Supporting Documentation 3/19/10.

Your site is 700m from the Castleford Air Quality Management Area declared on the grounds that the annual Nitrogen Dioxide limit value is unlikely to be achieved due to traffic pollution. While this does not preclude development, developers should consider any potential impact they may have on air quality in the area.

Should you have any further queries do not hesitate to contact this office.

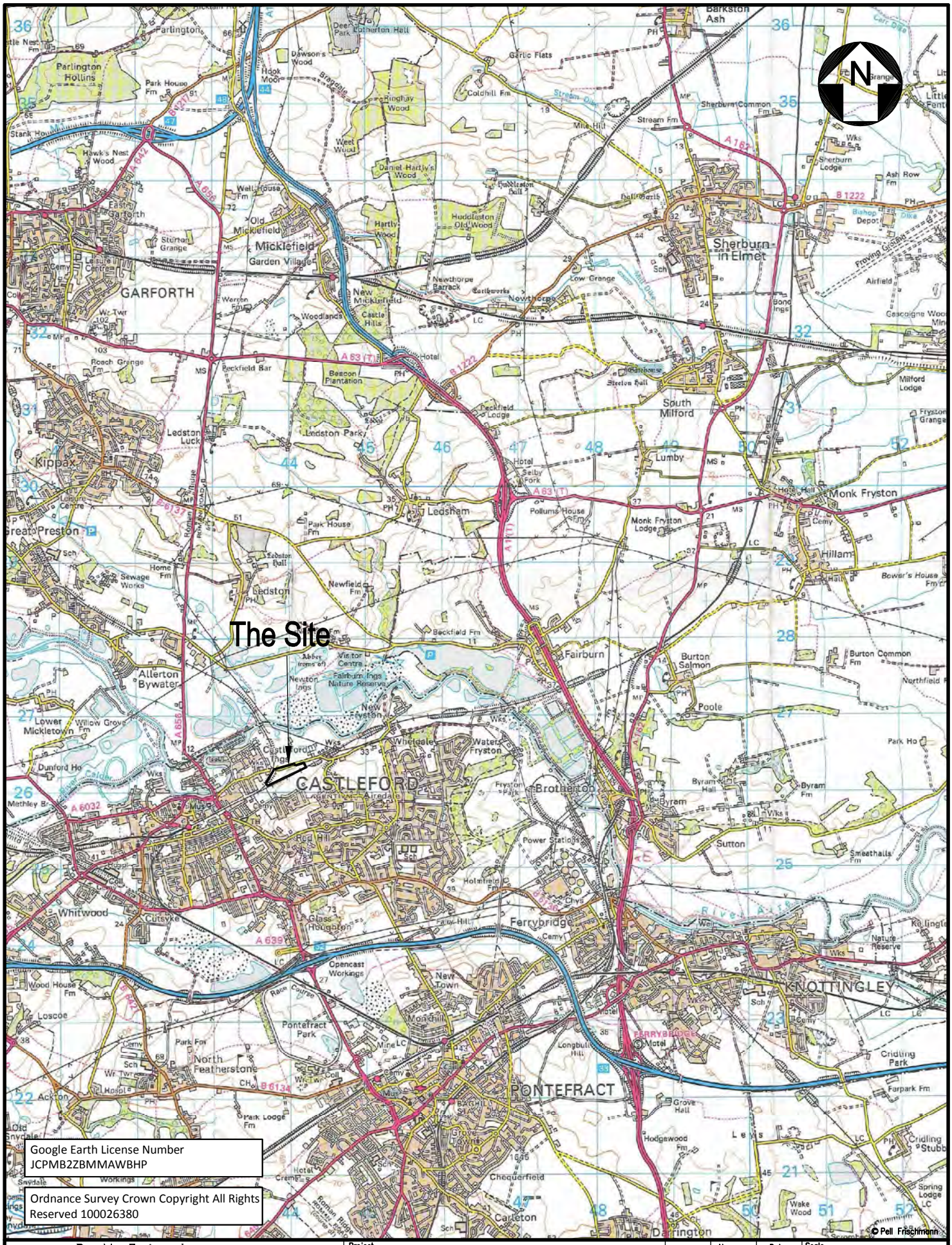
I gratefully acknowledge receipt of your card payment of the agreed fee of £115.

Yours sincerely

DR S J ATKIN
Assistant Scientific Officer

APPENDIX D

Drawings



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GEORGE HOUSE, GEORGE STREET, WAKEFIELD WF1 1LY
Telephone +44 (0)1924 368 145
Email: pfwakefield@pellfrischmann.com
www.pellfrischmann.com

Client: CLEAN POWER PROPERTIES LTD.

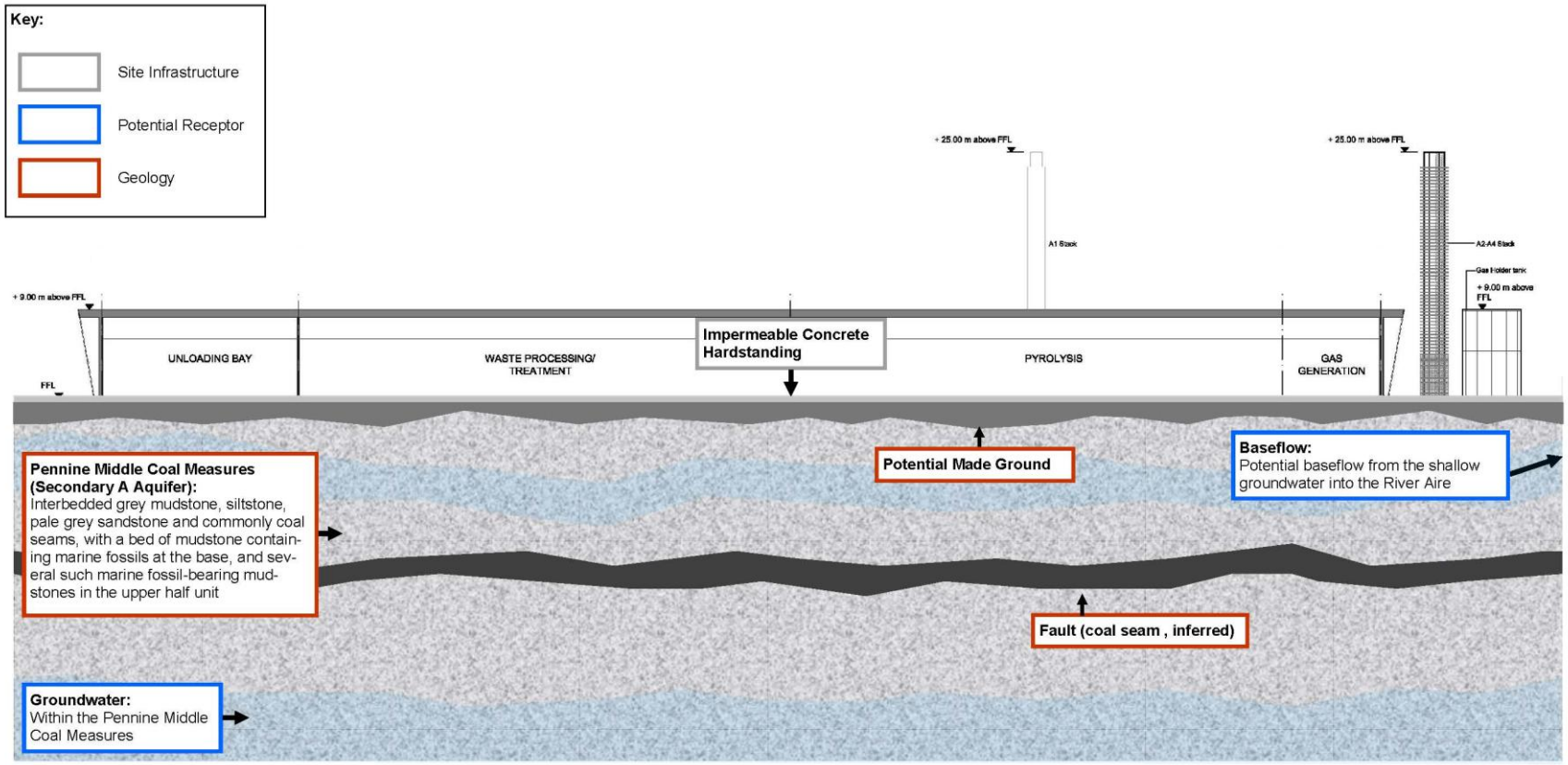
Project: ALLERTON BYWATER

Drawing Title: SITE LOCATION PLAN

	Name	Date
Drawn	ME	07.03.12
Designed		
Checked	AC	07.03.12
Approved	N/A	

Scale: NOT TO SCALE
File No.: E57016/VBA/T08/01
Drawing Status: FOR INFORMATION
Drawing No.: FIGURE 1
Revision: n

Annex C – Conceptual Model



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

Rev:	Date:	Desc:
0	JAN 13	Original

Client:	Clean Power (UK) Ltd	**Job No:**	SOL1213CPP09_AB	**Drawing No:**	CPP01
Project:	Wheldon Energy Recovery Centre	**Date:**	January 2013	**Revision:**	0
Drawing Title:	Conceptual Model	**Drawn By:**	Sophie Perrin	**Scale:**	NTS

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Key:

- Site Infrastructure
- Potential Receptor
- Geology