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Phase 2 Geo-environmental Report

ON

PROPOSED DEVELOPMENT

AT

**ABBAY ROAD NORTH, SHEPLEY
PHASE 2**

FOR

YORKSHIRE COUNTRY PROPERTIES LTD

AUGUST 2022

Rev A

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0.0 EXECUTIVE SUMMARY

SITE	The site is located to the south east of Abbey Road North (A629), Shepley. and is situated around Ordnance Survey grid reference 41995, 410100. The site is irregular in shape, with the western boundary formed by Abbey Road North, and the north eastern boundary formed by Knowle Road. The southern boundary is formed by adjacent fields. The site is primarily grassed, with immature tree growth noted in the south west, west, north east and south east. A watercourse crosses the site from south to north. There are scattered small buildings across the site. A foul sewer runs from the south east to the north, and overhead powerlines are noted in the north and west of the site. The site is a valley with the watercourse at the base running south to north and slopes from south to north at a grade of approximately 1 in 9.
HISTORY	The site has remained as undeveloped field except the small buildings noted on site. There has primarily been commercial/industrial development to the west of the site including a gas works, sawmill and malthouse. There has been little development adjacent the remainder of the site.
GEOLOGY	There are no areas of made ground or superficial deposits shown overlying the site on groundsure reports. However, there is an area of made ground associated with the railway line 20m to the north and a landfill 10m north east. The western third of the site is underlain by the Grenoside Sandstone formation, consisting of Sandstone. The eastern two-thirds of the site are underlain by the Pennine Lower Coal Measures Formation consisting of Mudstone, Siltstone and Sandstone. A coal outcrop is shown crossing the site from north to south adjacent the stream. Boreholes undertaken in Phase 1 to the south of this development proved up to 0.7m of topsoil and clays overlying 15.9-16.5m of sandstone. Beneath the sandstone, there were alternating bands of mudstone to a depth of 30m below existing ground levels In the western third of the site, the trial pits proved a thin layer of topsoils and clays overlying a sandstone bedrock. The sandstone was encountered at 0.2-0.9m below existing ground levels. In the eastern two thirds of the site, the trial pits generally proved thin layers of topsoils, clays and made ground overlying a mudstone bedrock.

A small area of re-engineered clays extending to a depth of 5.5m was also recorded in the east of the site.

The boreholes undertaken on site generally proved a shallow depth of topsoils and clays, with the exception of the area of re-engineered clays extending to a depth of 5.5m, overlying alternating bands of sandstone and mudstone to a depth of 30m with no coal encountered.

MINING/QUARRYING	The Coal Authority states that the property is not in a surface area that could be affected by past recorded underground coal mining, however it is in an area where the Coal Authority believes that there is coal at or close to the surface that may have been worked by private individuals. The eastern two thirds of the site are shown as an area of probable shallow mine workings. The trial pit and borehole investigation works undertaken found no coal or evidence of workings beneath the site.
HYDROLOGY	The nearest open surface water feature to the site is an unnamed watercourse located in the centre of the site heading south to north..
HYDROGEOLOGY	The bedrock underlying the site is classed as a Secondary (A) Aquifer. Perched groundwater ingress was noted in two of the sixteen trial pits undertaken at depths up to 2.0m below existing ground levels. During the gas monitoring, water levels were recorded at 0.1-2.5m below existing ground levels.
HAZARDOUS GAS	The property is not in an area requiring radon protection measures. Gas testing has proven a maximum carbon dioxide concentration of 3.6% and no methane. Based on the maximum concentrations and gas flow rates measured, the gas regime found on this site can be currently classified as Green.
CONTAMINATION	Half of the samples proved elevated levels of Arsenic, up to a maximum of 270 mg/kg. A single sample of topsoil proved an elevated level of 230 mg/kg of Chromium. Two samples of topsoil proved elevated levels of Mercury up to 5.1 mg/kg.
REMEDIATION	Further sampling of the topsoil should be taken in-situ to determine if the above contamination represents hotspots, or are indicative of the topsoil as a whole.

Underlying strata to be sampled to determine depth of capping required.
Clean topsoil to be imported to site if required.

FOUNDATIONS

For the majority of the site, strip/trench fill footings taken down to the natural clays/sandstones/mudstone may be adopted.

In the deeper area of re-engineered clays in the east, piled foundations will be required.

DRAINAGE

Infiltration methods have proved unsuitable for use on site. A discharge rate must be agreed with the Local Water Authority and the IDB.

1.0 INTRODUCTION

- 1.1 As requested by Yorkshire Country Properties, this practice carried out ground and contamination investigation works to the proposed Phase 2 of the development at Abbey Road North, Shepley.
- 1.2 The purpose of the report was to:-
 - 1.2.1 Identify the nature of the near surface strata, in order to enable recommendations to be made as to the most economic foundation solution for the proposed residential development.
 - 1.2.2 To identify any areas of contaminated ground.
 - 1.2.3 Propose a suitable outline remediation strategy, which will enable the site to be developed safely, to the satisfaction of the overseeing regulators and in compliance with the current environmental standards.
 - 1.2.4 Investigate the possibility of shallow mine workings throughout the site.
 - 1.2.5 Determine if infiltration methods would be a suitable long term form of surface water disposal.
- 1.3 Soil sampling was undertaken via trial pits to determine the near surface strata. Distributed samples were taken for testing to ascertain the nature of the soils and fills present.
- 1.4 The conclusions and recommendations made in this report are limited to the findings of the preliminary Geotechnical Survey. The report is made on condition that Haigh Huddleston Associates will not in any circumstances be liable for loss, arising directly or indirectly from ground conditions encountered between trial pits and boreholes, which have not been revealed by the investigation.
- 1.5 Any opinion given on the possible configuration of strata between trial pit and borehole locations and below maximum depth of the investigation is for guidance only. Any remarks on groundwater conditions made are based solely on observations made at the time of investigation. Kindly note that levels may differ from those reported due to seasonal variations or other influences.
- 1.6 Furthermore, there is the possibility that any trial pits or boreholes undertaken as part of the investigatory works may be within the influence of existing or proposed foundations or excavations. Haigh Huddleston Associates cannot be held responsible

for any failure of any excavations, foundations or structures within the influence of the trial pits or boreholes.

2.0 THE SITE

- 2.1 The site is located to the east of Abbey Road North (A629), Shepley, and is situated around Ordnance Survey grid reference 419950, 410100. The site consists of the second phase of a larger development. A site location plan is included in Appendix A.
- 2.2 The site is irregular in shape, with the western boundary formed by Abbey Road North, and the north eastern boundary formed by Knowle Road. The southern boundary is formed by adjacent fields. The approximate site area is 1.9ha.
- 2.3 A dry stone wall crosses the site from south to north dividing the site into a western third and an eastern two-thirds. The watercourse follows the line of the stone wall and exits the site to the north beneath Knowle Road before being culverted beneath the railway embankment.
- 2.4 The western third of the site is overgrown with long grass and nettles. There is immature tree growth, primarily fir trees, to the western edge and southern third of this field which is fenced off. In the central and eastern areas of the site are several small outbuildings and a concrete floor slab to a former building.
- 2.5 The eastern two thirds consist of better kept shorter cut grass. At the time of the site investigation, due to the slope and soft nature of the topsoil in this area, it proved difficult to manoeuvre the tracked plant. There is immature tree growth noted to the northern boundary and in the southern third of the field. A single greenhouse is located in the south east of the site.
- 2.6 The majority of the site boundary is formed by a 1m high dry stone wall. The central area of the southern boundary is formed by a post and wire fence.
- 2.7 The site slopes from south to north at a grade of approximately 1 in 9, from a high point of 183.75m AOD in the south eastern corner towards a low point of 168.80m AOD in the central northern area. The watercourse is approximately 600-800mm lower than the adjacent ground.
- 2.8 Overhead electricity lines start in the north west and head eastwards adjacent the northern boundary. A second set of overhead electricity lines start adjacent the

western boundary and head southwards. It is assumed there are underground electricity cables in this area of the site.

- 2.9 An existing foul sewer enters the site from a property to the south and leaves the northern boundary adjacent the watercourse.

3.0 SITE HISTORY

A number of historical Ordnance Survey plans from 1854-2014 have been consulted. These are contained for reference within Appendix C to the rear of the report. Below is a brief description outlining the significant developments that may effect future construction of the site.

Date	Historical uses on site	Historical findings within 100m perimeter of the site	Historical findings further than 100m perimeter of the site
1854	i) The site is shown as open fields. ii) A well is indicated in the middle of the northern boundary, where the watercourse exits the site.	i) Abbey Lane forms the western boundary. ii) Un-named track forms northern and eastern boundaries. iii) Railway line heading west-east 20m north of the site.	i) Old coal pit 400m south of site.
1891-1892	i) Wells no longer shown.	i) Gas works 10m west of the site.	i) Victoria Mills and mill ponds 150m south of site. ii) Old coal pit no longer shown 400m south of site.
1903-1906	i) The on-site features are similar to the previous sheet.	i) Abbey Lane Malthouse 10m north west of site. ii) Shepley Saw Mill 20m west of site.	i) No significant developments further than 100m from the site.
1932-1970	i) The on-site features are similar to the previous sheet.	i) Gas works no longer labelled 10m west of site.	i) No significant developments further than 100m from the site.
2002	i) The on-site features are similar to the previous sheet.	i) Pond located immediately south of the site.	i) No significant developments further than 100m from the site.
2010-2014	i) The on-site features are similar to the previous sheet.	i) No significant developments within 100m of the site.	i) No significant developments further than 100m from the site.

4.0 SITE GEOLOGY & MINING

- 4.1 The BGS Digital Geological Map of Great Britain at 1:10,000 and 1:50,000 scale have been consulted and we would report as follows:-
- 4.2 There are no areas of made ground or superficial deposits shown overlying the site, however an area of made ground is located approximately 20m north of the site associated with the railway line.
- 4.3 The western third of the site is underlain by the Grenoside Sandstone formation, consisting of Sandstone. The eastern two-thirds of the site are underlain by the Pennine Lower Coal Measures Formation consisting of Mudstone, Siltstone and Sandstone.
- 4.4 A Coal Authority Report is included in Appendix B and states that the property is not in a surface area that could be affected by past recorded underground coal mining. However, the property is in an area where the Coal Authority believes that there is coal at or close to the surface, which may have been worked at some point in the past.
- 4.5 The property is not in area where the Coal Authority has granted, or plans to grant, a licence to remove or otherwise work coal using underground methods. However, reserves of coal are thought to exist in the local area which could be worked at some time in the future.
- 4.6 No mine entries are recorded within 20m of the site boundary.
- 4.7 The Coal Authority Interactive Map Viewer shows a coal outcrop crossing the site from south to north adjacent the stream. To the east of this outcrop, approximately two thirds of the site is shown to be an area of probable shallow mine workings.
- 4.8 Boreholes undertaken in Phase 1 to the south of this development proved up to 0.7m of topsoil and clays overlying 15.9-16.5m of sandstone. Beneath the sandstone, there were alternating bands of mudstone to a depth of 30m below existing ground levels. It should be noted these boreholes were undertaken to the west of the indicated coal seam, the probable workings are indicated to the east.

5.0 ENVIRONMENTAL CONSIDERATIONS

5.1 Radon

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

No Radon Protective Measures are necessary.

5.2 Landfill Sites

A landfill recorded as accepting inert and industrial waste is located 10m north east of the site.

5.3 Flood Risk

The site is not located within a designated Environment Agency flood risk zone or shown to be at risk of flooding from rivers or the sea.

5.4 Groundwater

The bedrock underlying the site is classed as Secondary A Aquifer. These are 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.

There are six groundwater abstraction licences for potable water recorded within 500m of the site. These are located 215-220m south west of the site.

A revoked discharge consent with an effluent type of unspecified trade discharges is recorded 105m south west of the site, with the receiving water being a tributary stream of Shepley Dike. This was active from 1982-1991.

There are no surface water abstraction licences recorded within 250m of the site.

There is one recorded pollution incident to controlled waters within 250m of the site. This is identified as oils and fuels pollution, and located 70m north west of the site. This was classified as a Category 3 (minor) incident.

Only the central southern area of the site, where the watercourse enters the site, is located in Source Protection Zone 1.

The nearest open surface water feature is an un-named watercourse crossing the centre of the site from south-west to north-east. This is classified as an inland river not influenced by normal tidal action.

6.0 PRELIMINARY SITE CONCEPTUAL MODEL

- 6.1 The initial stage in assessing the risks posed from contaminated land during the redevelopment of a site is to prepare a conceptual model. A generalised conceptual model can be developed highlighting the main pollutant linkages through a contaminant ► pathway ► receptor model for a residential housing development. In order to prepare the conceptual model for a particular site the following parameters need to be reviewed as discussed below.
- 6.2 Contamination of existing land can be caused by a number of factors, including:-
- i) Possible historical/current industrial activities.
 - ii) Disposal of waste materials.
 - iii) Storage of materials.
 - iv) A number of natural processes can also lead to hazardous gases and elevated heavy metals.
- 6.3 Potential pathways can include ground and surface water, permeable strata, existing services providing a conduit and voided ground. Potential receptors can include human health, ecosystems, controlled waters and building structures. There are a number of ways that a receptor can be exposed to the contaminant these include, inhalation, direct contact, ingestion, dermal contact and uptake.
- 6.4 There have been no reported historical uses of the site likely to cause significant contamination, however there is a potential risk of contamination from the following:-
- i) Possible shallow mine workings beneath the site.
 - ii) Industrial land uses west of the site, including engineering and gas works.
 - iii) Potential ground gas migration from shallow mine workings and landfill to north east of site.
 - iv) Construction materials within outbuildings in western third of site.
- 6.5 Considering the proposed health care end use, there will be two possible human receptor groups exposed to the existing onsite contamination:-
- a) Site operatives during development.
 - b) End users, future site residents (the critical receptor is a 6 year old female).

- 6.6 Human receptors may be exposed to site contamination by a number of possible pathways. These pathways are summarised in Table 1 below.

Table 1- Potential Human Exposure Pathways

<u>Human Exposure Pathway</u>	<u>Site Residents</u>	<u>Construction Workers</u>
Soil Ingestion	YES	YES
Consumption of Home Grown Vegetables	YES	NO
Dermal Contact	YES	YES
Dust Inhalation	YES	YES
Gases/Vapours	YES	NO

- 6.7 The construction workers will come into contact with any contaminated soil to a far greater extent than future residents. The exposure pathways are generally through dermal contact and indirect ingestion. However their exposure will be for a limited time and the provision and correct use of personnel protective equipment and adequate welfare facilities during construction should restrict their risks to acceptable levels.
- 6.8 The risk of pollution to controlled waters by existing contamination is considered low. There have been no recorded historical uses of the site likely to cause significant contamination. However, there is a risk that surface water run-off during construction on site may wash contaminants into the watercourse crossing through the site. It is recommended a surface water management plan is put in place prior to commencing work on site.
- 6.9 No specific areas of ecological importance have been identified in the initial desk top study. Therefore the site is considered to be in a low risk environmental setting. The potential for phototoxic materials to exist at shallow depth should be considered, these could pose a potential risk to new planting and soft landscaping areas within the proposed development.
- 6.10 The proposed planning drawings show detached, semi-detached and terraced houses, with private garden and car parking areas. The presence of elevated sulphates and hydrocarbons could affect the long term integrity of buried concrete structures, including foundations and drainage pipes. Plastic water supply pipes can also be damaged by the presence of hydrocarbon contamination.

7.0 FIELDWORK

- 7.1 Site investigation works were undertaken on 26-27 November 2020 using an 8 tonne tracked excavator with 600mm wide bucket. A total of sixteen trial pits were excavated, three of which were used for soakaway testing. In addition to this, sixteen exploratory boreholes were also carried out to depths of 12-30m, in order to ascertain the presence of underground shallow coal workings. Five further shallow boreholes were undertaken and fitted with piezometers to enable future gas and ground water level monitoring.
- 7.2 Materials encountered in the trial pits and boreholes were examined and categorised. Trial pit and borehole logs are contained within Appendix B of the report.
- 7.3 The soakaway tests were undertaken in accordance with the method specified in BRE Digest 365 Soakaway Design. An instantaneous supply of water was provided via a bowser. In general, the trial pits were filled and the water levels were recorded against time as the water permeated into the natural strata. Due to time constraints only one soakaway test was undertaken within each trial pit. The water level was monitored over an extended time period to determine the infiltration rate for the sandstone strata.
- 7.4 The site investigation works were designed to achieve comprehensive site coverage within the proposed development area. In particular, the boreholes were undertaken in the eastern half of the site where the probable shallow workings were indicated. The locations of boreholes and trial pits on site were limited by the tree growth, overhead powerlines and drainage known to cross the site.
- 7.5 Soil samples were removed from the natural and made ground deposits within the trial pits. The samples were removed by operatives wearing gloves and placed into airtight clean plastic containers and glass bottles for transportation to the laboratory.
- 7.6 A total of twelve samples from the natural and made ground deposits were recovered from the trial holes for chemical analysis. The testing was carried out by a UKAS accredited laboratory to nationally or accredited in-house methods. The results of the contamination testing are contained within Appendix C of this report.

- 7.7 A suite of common potential contaminants consisting of heavy metals, phytotoxic metals, sulphates, sulphides and poly-aromatic hydrocarbons was analysed for, including Asbestos.

8.0 RESULTS OF THE INVESTIGATION

8.1 GEOTECHNICAL INVESTIGATION

8.1.1 A copy of the trial hole and borehole logs providing a complete record of strata encountered beneath the proposed development is presented in Appendix B.

8.1.2 The fieldwork proved the site can roughly be divided into three main areas, the western field, the eastern field and a central southern area adjacent the existing glasshouse. In addition to this, an area of re-engineered ground was encountered in the east of the site.

8.1.3 WESTERN FIELD (TP01, TP02, TP14, TP15, TP16, BH01, BH02, BH16)

8.1.3.1 All the trial pits undertaken proved a 0.2-0.4m thick surface layer of rough grassed dark brown topsoil, generally thicker towards the lower northern end of the site. In only TP16 at the higher southern end of the site, a 0.7m thick layer of soft light brown sandy clay was encountered underlying the topsoil.

8.1.3.2 Underlying the topsoil and clay was a weak to moderately strong highly weathered brown sandstone excavated as angular and sub-angular gravels and cobbles in a sandy matrix, with the occasional boulder. The sandstone was encountered at 0.2-0.9m below existing ground levels and continued to the base of the trial pits at 1.1-1.5m below existing ground levels.

8.1.3.3 Boreholes BH01, BH02 and BH16 in this part of the site proved between 1.4m and 1.6m of topsoils and clays overlying sandstone, which extended to the base of BH02 and BH16 at 15m below existing ground levels. BH01 was extended to 30m depth and proved a mudstone strata at 18.5m that extended to the base of the borehole. No coal or evidence of coal workings were proved in these boreholes.

8.1.4 EASTERN FIELD (TP03-TP11, BH06-BH13)

8.1.4.1 Due to the soft nature of the topsoil and slope of the ground, it proved difficult to track the drilling rig and excavator around the site.

8.1.4.2 TP03 was undertaken in the north of the eastern field and proved rough grass overlying 0.3m of dark brown topsoil. Beneath this was a 0.9m thick layer of firm brown slight mottled grey very sandy clay and then alternating thin bands of mudstone and firm brown sandy clay with isolated pockets of mudstone and ironstone to a depth of 2.0m below existing ground levels. At the base of the trial pit, a moderately strong light brown sandstone was encountered that proved difficult to excavate.

8.1.4.3 TP04 was undertaken adjacent the dry stone wall dividing the western and eastern fields. This proved rough grass over 0.4m of dark brown topsoil containing large loose walling stone and small pieces of pottery overlying re-engineered soft brown clays containing occasional sandstone gravels to a depth of 1.3m below ground level. Beneath this a natural moderately light brown sandstone that proved difficult to excavate was encountered. This is believed to be the former location of the watercourse before it was infilled and diverted to the western side of the dividing wall.

8.1.4.4 TP08 was undertaken in the east of the eastern field and proved rough grass over 0.4m of dark topsoil overlying 1.2m of made ground consisting of soft soils, clays and sandstone cobbles. Underlying this, a very weak, loosely compacted re-engineered grey shale extended to the base of the trial pit at 3.0m below existing ground levels where the trial pit was terminated.

8.1.4.5 BH07 and BH09-BH12 were undertaken in the vicinity of TP08 to determine the depth and extents of re-engineered ground. BH07 and BH12 proved up to 5.5m of soft ground overlying sandstone to a depth of 9.0-12.0m. BH09-BH11 proved 1.7-1.8m of topsoils and clays overlying mudstone/sandstone to a depth of 6.0-10.0m.

8.1.4.6 In the remainder of the trial pits excepting TP07, the surface consisted of rough grass overlying 0.2-0.3m of dark brown topsoil. At the surface of TP07, and underlying the topsoil of all but TP06, was a 0.8-1.5m thick layer of soft to firm light brown/light grey clay with occasional mudstone pockets. In TP05, pockets of immature coal and shale were noted within the clay at depths of 0.8-1.3m below existing ground levels.

8.1.4.7 Beneath the clay was a 0.5-1.3m thick layer of very weak to moderately light brown/grey mudstone excavated as shaley and sub-angular gravels. TP05 and TP09 terminated in this strata at depths of 2.2m and 2.6m below existing ground levels respectively.

8.1.4.8 At the base of the remaining trial pits except TP07, there was a weak to moderately weak dark grey mudstone excavated as thinly bedded shaley and sub-angular gravels. This was encountered at depths of 1.5-2.2m below existing ground levels and extended to the base of the trial pits at 2.6-2.8m below existing ground levels.

8.1.4.9 At the base of TP07 there was a layer of moderately weak black shale that was encountered at 2.2m and extended to the base of the trial pit at 2.6m below existing ground levels.

8.1.4.10 The boreholes undertaken in the eastern field generally proved 1.4-1.7m of topsoil and clays/mudstone overlying sandstone, or alternating bands of sandstone. In BH08, the alternating bands of mudstone and sandstone extended to the base of the borehole at 30m below existing ground levels. In the remainder of the boreholes, a dark mudstone was encountered at 18.2-21.4m below existing ground levels and extended to the base of the boreholes at 30m below existing ground levels. No coal or evidence of coal workings were proved in these boreholes.

8.1.5 CENTRAL SOUTHERN AREA (TP12, TP13, BH14, BH15)

8.1.5.1 TP12 and TP13 proved 0.3-0.5m of topsoil containing pockets of re-engineered clays overlying 0.5-0.7m of soft light brown re-engineered sandy clay with occasional sandstone gravels and dark grey/black clay pockets. The re-engineered clays terminated at 1.0m below existing ground levels.

8.1.5.2 Underlying the re-engineered clay in TP12, a weak light brown/grey weathered mudstone excavated as fine gravels extended to the base of the trial pit at 2.7m below existing ground levels. In TP13, beneath the re-engineered clay were thin alternating bands of sandstone and mudstone to a depth of 2.0m below ground levels were a strong sandstone that became difficult to excavate was encountered and the trial pit was terminated in this strata at 2.1m below existing ground levels.

8.1.5.3 BH14 and BH15 in this area of the site proved 1.5-1.6m of topsoils and clays/mudstone overlying bands of mudstone and sandstone to a depth of 20.8-21.0m below existing ground levels. Beneath this a dark mudstone strata extended to the base of the boreholes at 30m below existing ground levels. No coal or evidence of coal workings were proved in these boreholes.

- 8.1.6 None of the boreholes undertaken proved coal seams or evidence of workings to depths of 30m below existing ground levels.
- 8.1.7 As discussed previously in the report, three of the trial pits were used to carry out soakaway tests in order to obtain infiltration rates across the site. These were all undertaken in the sandstone strata in the western field. No soakaway tests were undertaken in the impermeable clay and mudstone strata encountered in the eastern field.
- 8.1.8 The infiltration rate has been calculated in each case between the 75% and 25% full values as recommended in the BRE Digest 365. The soakaway results are included in Appendix B and are summarised Table 2 below:-

Table 2 Summary of infiltration rates

SOAKAWAY NUMBER	INFILTRATION RATE m/s x10⁻⁶
TP01	ABANDONED DUE TO RISE IN LEVELS
TP02	3.9
TP04	4.4

- 8.1.9 During the soak-a-way tests, one trial pit recorded a rise in ground water levels, while the other two recorded low infiltration rates of 3.9-4.4x10⁻⁶ m/s.
- 8.1.10 The results of the geotechnical analysis undertaken on the samples of clayey soil taken indicates the clay to be of intermediate to high plasticity (Plasticity Index 24-28%). If the modified results are calculated, taking into account the percentage of material retained on a 425micron sieve, the results correspond to a medium shrinkage clay.

8.2 GROUNDWATER

- 8.2.1 Groundwater ingress was noted within two of the sixteen trial pits undertaken. In TP08 in the area of re-engineered clays in the east of the site, a considerable amount of perched ground water entered the trial pit from the re-engineered ground. In TP14 in the west of the site, a small amount of groundwater was noted at the base of the trial pit at 2.0m below existing ground levels.

8.2.2 No water strikes were recorded during the boreholes undertaken on site. During the gas monitoring, water levels have been recorded in the piezometers at 0.10-2.50m below existing ground levels.

8.2.3 It should be recognised that ground water levels may vary throughout the year. During periods of heavy rainfall the groundwater levels may be substantially higher than the results revealed in these investigations.

8.3 **GAS MONITORING**

8.3.1 As discussed previously BH01, BH05, BH08, BH12 and BH16 were installed with gas standpipes and lockable covers. Gas testing has been undertaken on site on two occasions.

8.3.2 A standard gas monitoring procedure has been followed in accordance with CIRIA guidance, including measurement of the following:-

- i) Methane, Oxygen and Carbon Dioxide concentrations.
- ii) Atmospheric Pressure.
- iii) Gas Flow Rate.
- iv) Standing water level.

8.3.3 The result of the monitoring undertaken is summarised in Table 3 below.

Table 3 - Summary of Recorded Gas Levels.

Borehole No.	Date	Oxygen %	Carbon Dioxide %	Methane %	Flow Rate Peak Steady (l/hr)	Depth to Water (m)	Atmospheric Pressure (mb)
BH01	08.12.20	17.3	1.0	NR	ND	1.50	978
	21.01.21	BOREHOLE FLOODED				0.40	-
	19.02.21	16.3	0.9	NR	ND	1.90	978
	11.03.21	15.0	0.5	NR	ND	2.10	967
BH05	08.12.20	12.7	3.6	NR	6.9 0.9	0.95	977
	21.01.21	13.0	1.7	NR	86.4 3.9	0.30	955
	19.02.21	16.9	0.1	NR	ND	1.90	977
	11.03.21	15.8	0.5	NR	111.4 5.2	0.70	966
BH08	08.12.20	12.2	2.7	NR	59.1 6.9	0.10	976
	21.01.21	BOREHOLE FLOODED				0.30	-
	19.02.21	17.0	0.1	NR	14.6 13.8	2.50	977
	11.03.21	BOREHOLE FLOODED				0.30	-

BH12	08.12.20	18.0	0.3	NR	ND	1.55	977
	21.01.21	BOREHOLE FLOODED				0.50	-
	19.02.21	16.9	0.2	NR	ND	1.60	977
	11.03.21	16.5	0.2	NR	ND	1.50	964
BH16	08.12.20	14.9	2.0	NR	ND	1.60	977
	21.01.21	14.7	0.9	NR	2.2 0.0	1.00	956
	19.02.21	15.4	2.5	NR	ND	1.60	978
	11.03.21	14.3	2.6	NR	ND	1.40	966

- 8.3.4 A maximum carbon dioxide concentration of 3.6% and no methane was recorded in BH05. A maximum peak flow rate of 111.4 l/hr and steady flow rate of 13.8 l/hr has been recorded on site. The readings on 21st January 2021 were taken during falling air pressure.
- 8.3.5 Due to the high ground water table conditions on site, the air within the piezometers has become compressed within the upper plain pipe section. This results in an artificially high flow rate at the start of measuring the flow, which rapidly reduces to a much lower steady flow rate. We would therefore use the steady flow rate for the calculation of the GSV in this situation.
- 8.3.6 Based on the maximum concentrations and gas flow rates measured, the gas regime found on this site can be classified as **Green** due to the low levels of carbon dioxide being recorded.
- 8.3.7 The gas monitoring is ongoing and a final report confirming the gas regime and specifying any protective measures required will be prepared following the completion of the monitoring.

9.0 CONTAMINATION

9.1 HUMAN HEALTH RISK ASSESSMENT

9.1.1 The appraisal of contaminated land within the UK is based on a risk assessment approach. The method involves the principle of defining a source ► pathway ► receptor, linkage to establish a human health risk. For any risk to exist to a potential receptor from an identified contaminant there must be an unbroken source ► pathway ► target relationship.

9.1.2 In the first instance site data for the contaminant levels are compared against guidance such as the CLEA values published by DEFRA. Should the site values exceed the guidance criteria, the contamination levels are recognised to have the potential to pose a risk to human health. Two scenarios are then available:-

- a) To break or remove one of the source ► pathway ► receptor linkages, by specifying an appropriate level of remedial work. Examples of remedial action may include the removal of the contaminated material or alternatively specifying a sufficient capping layer.
- b) The alternative approach is to provide a more detailed human health site specific risk assessment. This will involve examining factors such as soil properties, exposure assumptions, groundwater flows and contamination composition.

9.2 CONTAMINATION RESULTS

9.2.1 As stated above, in order to put the analytical results into context, the data has in the first instance been assessed in relation to several sets of guidelines: -

9.2.2 The analytical results have been assessed via an initial screening assessment with regard to the current Contaminated Land Exposure Assessment model (CLEA UK) for human health, which has been produced for the Environment Agency and the Department of Environment, Food and Rural Affairs (DEFRA). The CLEA model provides Soil Guideline Values (SGVs) for a limited range of contaminants only, and these are based on risk to human health. As such they do not take into account potential risks to other receptors eg groundwater and third party land.

- 9.2.3 It is proposed to redevelop the site for residential properties with private garden areas. Soil results have therefore been assessed against Generic Assessment Criteria (GAC) based on guidelines from the Chartered Institute of Environmental Health (CIEH) and Land Quality Management Ltd (LQM) S4UL document. Where there is no GAC, guidance limits have been adopted from sources referenced in the table below.
- 9.2.4 In addition to the above, the calculation of SGVs based on an acceptably low level of risk is currently being undertaken. These Category 4 Screening Levels (C4SL) have been calculated for six substances to date by modifying the toxicological/exposure parameters within CLEA. C4SLs have been used as tier 1 trigger levels within this assessment, superseding the previous CIEH and LQM SGVs.
- 9.2.5 Assessment of risk is considered as a tiered approach. Assessment based on non intrusive means is considered Tier 1 assessment, comparison against SGVs and GACs is a Tier 2 assessment, and the generation of and comparison with Site Specific Assessment Criteria (SSAC) is a Tier 3 assessment and is conducted where deemed appropriate following the Tier 2 assessment.
- 9.2.6 The sulphate and acid concentrations have been compared against the BRE digest "Concrete in Aggressive Ground" parts 1-4. This will enable the concrete class to be specified in relation to possible contact with aggressive soils.
- 9.2.7 The results of the chemical analysis are presented on the laboratory analysis sheets with Appendix C. A summary of the significance of the results is presented in Table 4.

Table 4**Comparison of contaminant against accepted guidance values for residential use with plant uptake**

<u>CONTAMINANT</u>	<u>SGV</u> <u>MG/KG</u>	<u>CONCENTRATION IN</u> <u>ALL SOILS.</u> <u>MG/KG</u>	<u>No. OF</u> <u>SAMPLES</u> <u>EXCEEDING</u> <u>GUIDANCE</u> <u>VALUES</u>	<u>PERCENTAGE</u> <u>OF SAMPLES</u> <u>EXCEEDING</u> <u>GUIDELINE</u> <u>VALUE</u>
Arsenic	37 (4)	9.5-270	6/12	50%
Cadmium	22 (4)	<0.1-0.4	0/12	
Chromium (Total)	130 (2)	27-230	1/12	8.3%
Lead	200 (4)	15-170	0/12	
Mercury (Total)	1.2 (1)	<0.05-5.1	2/12	16.7%
Selenium	250 (1)	<0.5-0.9	0/12	
Copper	2400 (1)	17-84	0/12	
Nickel	180 (1)	18.35	0/12	
Zinc	3700 (1)	54-140	0/12	
Sulphate	0.24 (3)	0.02-0.10	0/12	
Thiocyanate	50	<0.6-2.2	0/12	
Sulphide	250	<10-36	0/12	
Naphthalene	2.3 (1)	<0.1	0/12	
Benzo(a)pyrene	5 (4)	<0.1-0.8	0/12	
PAH (Total)	40	<1.6-7.8	0/12	
Phenols	760 (1)	<0.3-0.4	0/12	
Asbestos	No fibres	none	0/10	
pH	6-8	5.5-7.1	3/12	25%

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(2) DEFRA CLR SGV's withdrawn used for initial comparison

(3) BS 8110 1985 Table 6.1

(4) Category 4 Screening Levels

9.2.8 Half of the samples proved elevated levels of Arsenic. The peak value of 270 mg/kg is approximately seven times the tier 1 trigger value.

9.2.9 A single sample of topsoil proved an elevated level of 230 mg/kg of Chromium.

9.2.10 Two samples of topsoil proved elevated levels of Mercury. The peak value of 5.1 mg/kg is approximately four times the tier 1 trigger level.

9.2.11 No asbestos was found in the samples taken from site.

9.2.12 No elevated levels of sulphate were recorded in the samples taken from site, therefore a design sulphate class DS-1, ACEC class AC-1, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".

9.3 QUALITATIVE RISK ASSESSMENT

9.3.1 The Qualitative Risk Assessment is based upon the previously discussed source ► pathway ► receptor principle. In relation to the proposed site these may be described as follows:-

9.3.2 SOURCE

- i) Elevated levels of Arsenic.
- ii) Elevated level of Chromium.
- iii) Elevated levels of mercury.

9.3.3 PATHWAYS

- i) Ingestion of contamination material.
- ii) Inhalation of contaminated particles.
- iii) Dermal contact with the known contamination.
- iv) Leaching to controlled waters.

9.3.4 RECEPTORS

- i) Residential site users.
- ii) Construction and maintenance workers.
- iii) Controlled waters.
- iv) The building structure.

9.3.5 Each of the receptors will now be appraised and attribute the likely risks involved.

i) Residential site users.

Based on the chemical results obtained it is considered that there is currently a **moderate** risk to end users as elevated levels of contaminants were recorded throughout the site.

Half of the samples proved elevated levels of Arsenic, this included both the topsoil and underlying strata to a depth of 0.8m. The peak value of 270 mg/kg is approximately seven times the tier 1 trigger value.

A single sample of topsoil proved an elevated level of 230 mg/kg of Chromium.

Two samples of topsoil proved elevated levels of Mercury. The peak value of 5.1 mg/kg is approximately four times the tier 1 trigger level.

There were no elevated levels of PAH (Total) or PAH compounds.

No asbestos was recorded in the samples taken from site.

Due to the volume of topsoil on site, it is recommended that further in-situ testing is undertaken to determine if the samples taken from site are representative of the topsoil as a whole, or are isolated hotspots that can be removed from site. Similarly, further sampling should be taken of the underlying strata to confirm the marginally elevated level is an isolated hotspot.

Due to the presence of elevated levels of Arsenic within the subsoils, the clean capping layer should consist of a minimum of 150mm topsoil overlying 450mm of subsoils for a total clean cover of 600mm over areas of made ground and re-engineered soils or where the underlying natural strata has proved elevated levels of arsenic. Should the underlying strata prove clean, a reduced capping layer 300mm thick consisting of 150mm topsoils and 150mm subsoils may be used.

Based on the maximum concentrations and steady gas flow rates measured, the gas regime found on this site can be classified as **Green** due to the low levels of carbon dioxide being recorded.

The gas monitoring is ongoing and a final report confirming the gas regime and specifying any protective measures required will be prepared following the completion of the monitoring.

ii) Construction and Maintenance Workers.

It is considered that there is a **low** risk to construction and maintenance workers from the redevelopment of the site.

Construction workers should always wear PPE including overalls, boots and gloves when handling the contaminated materials onsite. In addition eating, drinking and smoking should be restricted to designated areas where the above hygiene facilities are available.

iii) Controlled Waters

The samples of strata both at the surface and at depth showed evidence of contamination, however, there are no incidents of pollution to controlled waters associated with the site. It is therefore considered that there is a negligible risk to groundwater and controlled waters from existing contamination on site.

However, it should be noted that a watercourse is located on site and care should be taken that no contaminants during the construction works are washed by surface water run-off into these.

iv) Building Structures.

No elevated levels of sulphate were recorded in the samples taken from site, therefore a design sulphate class DS-1, ACEC class AC-1, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".

Service providers should be forwarded the final validated chemical levels in order for them to provide an accurate specification for the apparatus to be provided. New services should be surrounded and backfilled with clean material to afford some protection to the apparatus and allow any future maintenance work to be undertaken in clean material.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 GEOTECHNICAL ASSESSMENT

10.1.1 The fieldwork generally proved a shallow depth of topsoil and clays overlying a mudstone or sandstone bedrock. However, in the eastern quarter of the site, a depth of soft re-engineered clays was proved up to 5.5m in depth before the sandstone bedrock was encountered. For initial design purposes we would envisage a safe bearing capacity of 100kN/m² where foundations are to be cited onto the clay strata, increasing to 150kN/m² where onto the mudstone/sandstone bedrock.

10.1.2 We would therefore initially suggest that the site is divided into two separate areas. In the deeper area of re-engineered clays in the east, piled foundations will be required. For the remainder of the site, strip/trench fill footings may be adopted.

10.1.3 RE-ENGINEERED CLAYS IN EAST OF SITE

10.1.3.1 The ground investigation proved up to 5.5m of soft re-engineered clay in the east of the site. It is recommended further investigation work is undertaken to determine the extent of the area of re-engineered clays. The approximate extent of re-engineered ground has been indicated on the site investigation plan in Appendix A.

10.1.3.2 The re-engineered clay is not considered a suitable foundation material and therefore all loadings should be taken through these materials onto suitable underlying strata.

10.1.3.3 We would therefore suggest that the proposed two storey traditional house construction should be constructed on piled foundations with a reinforced concrete suspended ground beam in this area of the site. The following general comments relating to piling are provided for guidance, and further advice should be sought from a specialist-piling contractor.

10.1.3.4 Piled foundations should extend and be socketed into the underlying bedrock. Pile records should be checked to ensure a minimum 3m pile length and that similar pile lengths are achieved throughout a plot and between adjacent structures.

10.1.3.5 The safe working load that may be supported on a pile is dependent on the pile diameter, its founding depth and the method of installation. As piles would be

founded in bedrock, they will be essentially end bearing, although there may also be some shaft adhesion within the infilled materials. It is essential that pile design allows for negative skin friction.

10.1.3.6 It is recommended that flexible service connections are used on this site, especially where they enter the buildings, in order to avoid any possible damage due to self-settlement of the weak strata once the site is developed.

10.1.3.7 Driven piles may lessen the volume of potentially contaminated made ground requiring off-site disposal, compared with continuous flight auger piled foundations. However, driving can induce some ground vibration. Assessment of any vibration risk to adjacent structures and/or existing site features should be undertaken by pile designer.

10.1.3.8 On completion of the piling works, pile testing should be undertaken to confirm the adequacy and load carrying capacity of the installed piles.

10.1.3.9 Should any shallow obstructions occur, i.e. large boulders, they should either be grubbed-up, or alternatively replacement piles installed. The pile logs should be checked prior to the piling rig departing site, to ensure consistent pile lengths are installed throughout the site.

10.1.3.10 The new houses can be built off ring beams designed to span the piles. In order to bond them to the piles, the tops of the piles must be tied to the reinforcement within the ground beams. This can be achieved by a variety of methods dependent upon the type of piles adopted.

10.1.3.11 For piled foundations suspended floor slabs should be utilised. A pre-cast 'Beam and Block' concrete ground floor construction could be utilised, and suspended across the ring beams.

10.1.3.12 In some circumstances pile foundations can provide a pathway for the vertical migration of contamination. The pile design should be undertaken in accordance with the Environment Agency's guidance "***Piling into Contaminated Sites***".

10.1.4 REMAINDER OF THE SITE

- 10.1.4.1 Outside the area of re-engineered clay, the proposed low rise residential constructions should be constructed on strip/trench fill footings founded entirely onto the natural clay strata. Where mudstone/sandstone is encountered within the excavations, the foundations should be deepened to lie entirely onto the mudstone/sandstone strata to avoid differential settlement. The foundation widths will vary dependent upon the line loadings calculated.
- 10.1.4.2 Foundations should be deepened where constructed adjacent to boundary retaining walls or existing buildings, to prevent any lateral forces being exerted on the retaining structure.
- 10.1.4.3 All foundations should be placed below a line of 45deg drawn up from the base of any services or other structures.
- 10.1.4.4 If any existing foundations or structures are encountered during construction, these should be totally removed from the excavations to enable the new foundations to be constructed without obstructions.
- 10.1.5 At present it is not anticipated that excessive ground water control measures will be required. Please note that ground water flows can vary throughout the year and a further assessment should be undertaken if construction work is proposed following a prolonged rainfall event.
- 10.1.6 No elevated levels of sulphate were recorded in the samples taken from site, therefore a design sulphate class DS-1, ACEC class AC-1, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".
- 10.1.7 Wherever any foundations are located near existing or proposed new trees, their foundations must be sited below the root growth zone. Reference should be made to the NHBC standards Chapter 4.2 "Building Near Trees" which provides guidance on foundation criteria, depths and construction. All services should be similarly protected. Plasticity testing of the clays on site has shown them to be of medium volume change potential.

10.1.8 Particular care will also need to be exercised with any new landscape and planting proposals with their effects on the new foundations being considered prior to planting.

10.2 MINING

10.2.1 The Coal Authority Report states that the property is not in a surface area that could be affected by past recorded underground coal mining. However, the property is in an area where the Coal Authority believes that there is coal at or close to the surface, which may have been worked at some point in the past.

10.2.2 CIRIA Special Publication 32 –‘Construction over abandoned mine workings’ states that where there is a rockhead to seam thickness ratio of at least 10:1, no further works are necessary as there is a negligible risk of void migration to the surface.

10.2.3 During the borehole investigation, no coal seams or evidence of workings were encountered at depths up to 30m below existing site levels. It is considered unlikely that there would be coal seams greater than 2m in thickness below the site, therefore the 10:1 bedrock to seam thickness is achieved within all the boreholes. We would therefore consider that the site is not at risk from shallow mine workings.

10.3 GROUND FLOOR SLAB – GAS MEASURES

10.3.1 As discussed previously, gas monitoring stations were installed in five of the borehole locations on site due to the possibility of ground gas migration from probable shallow mine workings in the vicinity, and the historical landfill located north east of the site.

10.3.2 No Radon Protection measures are required for the site.

10.3.3 A maximum carbon dioxide concentration of 3.6% and no methane was recorded in BH05. A maximum peak flow rate of 111.4 l/hr and steady flow rate of 13.8 l/hr has been recorded on site.

10.3.4 Due to the high ground water table conditions on site, the air within the piezometers has become compressed within the upper plain pipe section. This results in an artificially high flow rate at the start of measuring the flow, which rapidly reduces to a

much lower steady flow rate. We would therefore use the steady flow rate for the calculation of the GSV in this situation.

10.3.5 The proposed development consists of low rise residential housing and therefore the gas regime has been characterised in accordance with the traffic light methodology as outlined in **CIRIA Report C665**. Due to the low carbon dioxide levels on site, we would recommend the gas regime on this site be currently classified as **Green** by the NHBC traffic light system.

10.3.6 Due to the presence of trees immediately adjacent and on the site, a suspended beam & block floor will be required for the properties in accordance with NHBC Chapter 4.2, this will allow a ventilated void to be constructed beneath the floor construction.

10.3.7 A detailed analysis of the results and any gas protection measures required will be confirmed on completion of the on-site gas testing in a separate report.

10.4 SURFACE WATER DRAINAGE

10.4.1 The site investigation works for the site have generally proved topsoils overlying clays with a mudstone or sandstone bedrock.

10.4.2 During the three soak-a-way tests undertaken on site, one trial pit recorded a rise in ground water levels, while the other two recorded low infiltration rates of 3.9-4.4x10⁻⁶ m/s.

10.4.3 Due to the low infiltration rate and the existing gradients on the site, we would not consider infiltration methods a suitable long term drainage solution for the development.

10.5 CONTAMINATION ASSESSMENT

10.5.1 Half of the samples proved elevated levels of Arsenic. Four of these were from the topsoil, one from the made ground infill to the former watercourse and a marginally elevated level in the underlying sandstone in the west of the site. The peak value of 270 mg/kg is approximately seven times the tier 1 trigger value.

- 10.5.2 A single sample of topsoil proved an elevated level of 230 mg/kg of Chromium.
- 10.5.3 Two samples of topsoil proved elevated levels of Mercury. The peak value of 5.1 mg/kg is approximately four times the tier 1 trigger level.
- 10.5.4 There were no elevated levels of PAH (Total) or PAH compounds.
- 10.5.5 No asbestos was recorded in the samples taken from site.
- 10.5.6 Due to the volume of topsoil on site, it is recommended that further in-situ testing is undertaken to determine if the samples taken from site are representative of the topsoil as a whole, or are isolated hotspots that can be removed from site. Similarly, further sampling should be taken of the underlying strata to confirm the marginally elevated level is an isolated hotspot.
- 10.5.7 Due to the presence of elevated levels of Arsenic within the subsoils, the clean capping layer should consist of a minimum of 150mm topsoil overlying 450mm of subsoils for a total clean cover of 600mm over areas of made ground and re-engineered soils or where the underlying natural strata has proved elevated levels of arsenic. Should the underlying strata prove clean, a reduced capping layer 300mm thick consisting of 150mm topsoils and 150mm subsoils may be used.
- 10.5.8 Should any suspected areas of contamination be exposed during site strip/construction, an engineer should be contacted to determine if additional chemical testing should be undertaken. The on-site staff should maintain a photographic record and dates of any exposed contaminated material.
- 10.5.9 Should the existing topsoil on site prove unsuitable for re-use, clean material will need to be imported to site. All imported material should be tested for the range of contaminants listed previously in Table 4. Only material found to be below published trigger levels should be deemed uncontaminated and accepted for use on site.
- 10.5.10 If the imported material is from a Greenfield site, a minimum of 3 samples or 1 per 250m³ of imported material should be taken for testing, whichever is greater. If it is from a brownfield site, a minimum of 6 samples, or 1 per 100m³ of imported material should be taken for testing, whichever is greater. Material provided by a commercial

supplier should be certified to the same level of testing, with the certificate less than two months old.

- 10.5.11 Any imported certified material should be placed immediately. If this is not possible, or the material is not certified and sampling is to be carried out prior to being laid, it should be securely stored on site prior to use to prevent possible contamination from any materials on site.
- 10.5.12 If any areas of made ground are removed off site, they should be taken to a licensed waste site and full documentation should be obtained. Any material to be taken off-site should be suitably quarantined prior to removal to prevent cross contamination. Any relevant chemical test results should be given to the landfill operator, so that they can determine if this material is suitable to be disposed of in their licensed landfill.

11.0 SUGGESTED FURTHER WORK

- 11.1 Gas monitoring to be completed and final recommendations of any gas protection measures to be put in report.
- 11.2 Extent of soft re-engineered clays in east of site to be confirmed to determine affect on proposed foundations.
- 11.3 Further samples to be taken from in-situ topsoil to be determine if there are isolated contamination hotspots or if the contamination is prevalent throughout the topsoil. Removal of any contaminated material to be validated.
- 11.4 Further testing to be undertaken on underlying strata to determine proposed depth of clean capping required.
- 11.5 Clean topsoils and subsoils to be imported to site to provide clean capping layer to soft landscaped areas if required. All imported material to be validated.

12.0 APPROVALS

12.1 Proposals for the remediation of contaminated land may require the approval of numerous bodies.

These include:

- a) Kirklees Council Environmental Health Department as required by the building and planning regulations.
- b) The NHBC or similar as they will provide the insurance costs to cover the property.
- c) The Environment Agency if there are risks of contamination to ground or surface water systems. They will also require notification if material is removed from site and taken to an appropriate tip.
- d) Relevant highways and drainage authorities and other service companies may also wish to know about the level of contaminants.

Prepared by



M. Dean. BSc (Hons) HND

Checked by



M. Huddleston. Meng

March 2021

This report is subject to the provisions of the Copyright Acts and is for the sole benefit of Yorkshire Country Properties in respect of the proposals described.

APPENDIX A

Site Location Plan

Site investigation Plan

Typical Site Conceptual Model



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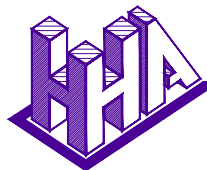
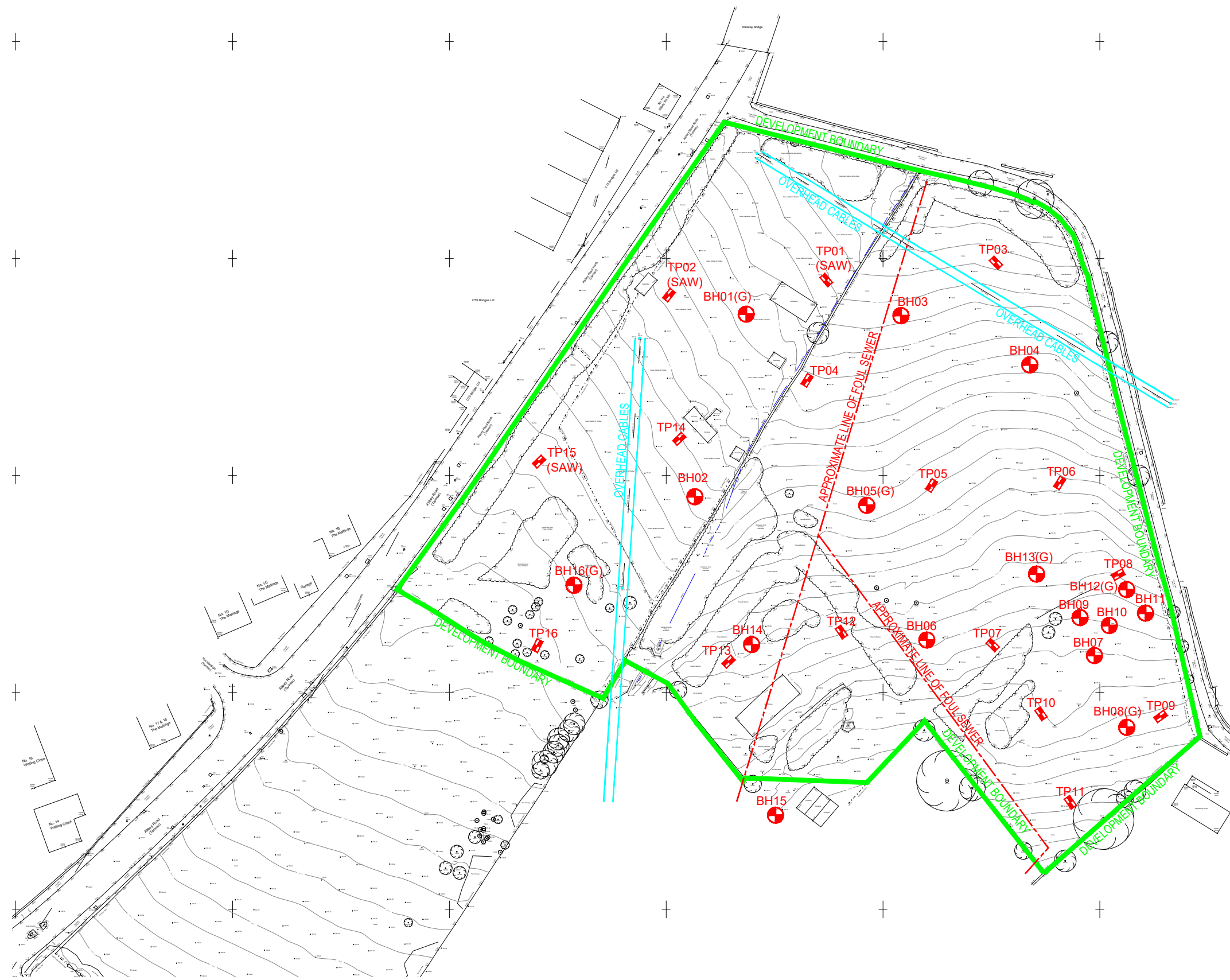
Client : Yorkshire Country Properties
Job Title: Abbey Road, Shepley (Phase 2)
Job Number : E19/7465

LOCATION PLAN

OS Grid Reference : SE 199100
Easting : 419945
Northing : 410087

Topographical Survey carried out using
GPS.





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Client				
YORKSHIRE COUNTRY PROPERTIES				
Project				
NORTH ABBEY ROAD, SHEPLEY PHASE 2				
Detail				
SITE INVESTIGATION PLAN				
Scale	Dwn	Chkd	Date	Dwg No.
1:1000	MD		Nov '20	E19/7465/003
©A3				

APPENDIX B

Trial Hole Logs

Soakaway Test Results

Borehole Logs

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0.0

	0.4
--	-----

Rough grass over dark brown topsoil. Sample taken at 0.2m.

0.5

Weak light brown highly weathered sandstone excavated as angular gravels and cobbles within a sandy matrix.

1.0

Becoming difficult to excavate at 1.5m.

1.5

1.5

2.0

2.5

3.0

3.5

4.0

Ground water encountered during excavation

NO

Sample taken

YES at 0.2m.

Sides of excavation remained stable

YES (minor instability within weathered sandstone)

Level

.....

NOTES:

.....

.....

TRIAL HOLE NO. 2



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Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.4	Rough grass over dark brown topsoil.
0.5		
1.0		
1.5		
	1.6	Weak light brown highly weathered sandstone predominantly horizontal bedded excavated as loosely compacted angular gravels and cobbles/flags within a sandy matrix.
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
Sample taken NO
Sides of excavation remained stable NO – minor instability within weathered sandstone
Level

NOTES:

.....
.....

TRIAL HOLE NO. 3



Haigh Huddleston & Associates

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Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.3	Rough grass over dark brown topsoil. Sample taken at 0.3m.
0.5		Firm brown slightly mottled grey very sandy clay.
1.0		
	1.2	
	1.3	Weak grey horizontally bedded shaley mudstone.
1.5		Firm brown sandy clay with isolated pockets of mudstone & ironstone.
	1.6	
		Very weak dark brown mudstone excavated as angular gravels.
2.0	2.0	
	2.1	Moderately strong light brown sandstone – difficult to excavate.
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.3m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....

TRIAL HOLE NO. 4



Haigh Huddleston & Associates

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Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.4	Rough grass over dark brown topsoil containing large loose walling stones, small pieces of pottery.
0.5		
1.0		
	1.3	
	1.4	Moderately strong light brown slightly weathered sandstone horizontally bedded, excavated as flags and gravel. Difficult to excavate.
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation	NO
Sample taken	NO
Sides of excavation remained stable	YES
Level	

NOTES:

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TRIAL HOLE NO. 5



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.3	Rough grass over dark brown topsoil. Sample taken at 0.2m.
0.5		Firm light brown mottled grey sandy clay. Sample taken at 0.6m.
	0.8	
1.0		Firm grey clay with (black) pockets of immature coal and shale.
	1.3	
1.5		Firm brown sandy clay.
	1.8	
2.0		Weak light grey mudstone excavated as shaley gravels.
	2.2	
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.2m & 0.6m.

Sides of excavation remained stable

YES

Level

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NOTES:

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TRIAL HOLE NO. 6



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.3	Rough grass over dark brown topsoil.
0.5		Weak brown weathered mudstone with occasional clay pockets.
	0.8	
1.0		Weak grey mudstone thinly bedded, excavated as shales.
1.5		
	1.6	
		Moderately weak dark grey weathered mudstone excavated as sub-angular gravels.
		Alternating colours, becoming stronger to excavate with depth.
2.0		
2.5		
	2.6	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
Sample taken NO
Sides of excavation remained stable YES
Level

NOTES:

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.....

TRIAL HOLE NO. 7



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 -101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
		Firm light brown slightly sandy clay.
0.5		
	0.6	Sample taken at 0.6m.
		Completely weathered mudstone.
	0.9	
1.0		Weak grey/brown/dark grey weathered mudstone excavated as thinly bedded shale.
1.5	1.5	
		Moderately weak dark grey/orangish brown weathered mudstone excavated as thinly bedded shale.
2.0		
	2.2	
		Moderately weak black shale.
2.5		
	2.6	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.6m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

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TRIAL HOLE NO. 8



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.4	Rough grass over dark brown soft topsoil.
0.5		
1.0		
1.5		
	1.6	Soft soil/clay/sandstone cobbles (made ground). Instability within trial pit. Significant ground water ingress.
2.0		
2.5		
3.0	3.0	Very weak loosely compacted re-engineered grey shale (made ground). Sides unstable.
3.5		
4.0		

REMARKS:

Ground water encountered during excavation YES
Sample taken YES
Sides of excavation remained stable NO
Level

NOTES:

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TRIAL HOLE NO. 9



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.2	Rough grass over dark brown topsoil. Sample taken at 0.2m.
0.5		Soft light brown/light grey sandy clay with occasional mudstone pockets.
1.0		
	1.3	
1.5		Weak light brown/grey weathered mudstone excavated as angular gravels.
2.0		
2.5		
	2.6	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.2m.

Sides of excavation remained stable

YES

Level

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NOTES:

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TRIAL HOLE NO. 10



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
		Rough grass over dark brown topsoil.
	0.2	
		Soft light brown sandy clay.
	0.4	
0.5		Firm light brown/grey clay.
1.0	1.0	Very weak grey weathered mudstone excavated as small angular gravels.
1.5		
	1.6	Weak dark grey shaley mudstone horizontally bedded, excavated as sub-angular gravels with occasional ironstone shales.
2.0		
2.5		
	2.6	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO

Sample taken NO

Sides of excavation remained stable YES

Level

NOTES:

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.....

TRIAL HOLE NO. 11



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.2	Rough grass over dark brown topsoil. Sample taken at 0.2m.
0.5		Firm light brown sandy clay. Sample taken at 0.5m.
1.0		
1.5		
1.7		
2.0		Weak light brown/grey mudstone excavated as sub-angular gravels.
2.2		
2.5		Weak dark grey/black shaley mudstone horizontally bedded, excavated as sub-angular gravels.
2.8		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.2m & 0.5m.

Sides of excavation remained stable

YES

Level

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NOTES:

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TRIAL HOLE NO. 12



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 -101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
0.5	0.5	Rough grass over dark brown re-engineered topsoil, containing pockets of re-engineered clay.
1.0	1.0	Soft light brown/grey re-engineered clay with occasional dark grey/black clay pockets. Sample taken at 0.7m.
1.5		
2.0		
2.5		
	2.7	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.7m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

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TRIAL HOLE NO. 13



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.3	Grass over dark brown topsoil.
0.5		Soft light brown re-engineered sandy clay with occasional sandstone gravels.
1.0	1.0	
	1.1	Moderately strong sandstone, horizontally bedded, excavated as boulders & gravels.
		Weak light brown mudstone excavated as sub-angular gravels.
	1.3	
	1.4	Moderately strong sandstone horizontally bedded, excavated as boulders & gravels.
1.5		Weak light brown mudstone excavated as sub-angular gravels.
2.0	2.0	
	2.1	Strong sandstone becoming difficult to excavate.
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

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TRIAL HOLE NO. 14



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.3	Rough grass over dark brown topsoil.
0.5		Moderately strong brown sandstone horizontally bedded, excavated as sub-angular boulders.
1.0		
1.5		
2.0	2.0	Becoming solid and difficult to excavate at 2.0m. Small amount of ground water migration in bottom of TP.
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

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TRIAL HOLE NO. 15



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Moderately strong sandstone horizontally bedded, excavated as sub-angular gravels and boulders.
1.0		
	1.1	Becoming difficult to excavate at 1.1m.
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

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TRIAL HOLE NO. 16



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	YORKSHIRE COUNTRY PROPERTIES	Job No :	7465
Site :	SHEPLEY PHASE 2	Date :	26 November 2020

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Soft light brown sandy clay.
		Sample taken at 0.6m.
	0.9	
1.0		Moderately strong horizontally bedded sandstone excavated as sub-angular gravels, occasional boulder.
		Becoming difficult to excavate at 1.4m.
	1.4	
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.6m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....

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Soil Permeability test

TP01

Site North Abbey Road, Shepley - Phase 2

Date

Nov-20

Client Yorkshire Country Properties

Job No.

E19/7465

Pit dimensions m
 Length 2
 Width 0.6
 Depth 1.5

Time	Time into Test Mins	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
10.35	0	1180	0.38400		2.86400	
10.39	4	1130	0.44400	-0.06000	3.12400	-0.08350
10.58	23	1120	0.45600	-0.01200	3.17600	-0.00334
11.24	49	1120	0.45600	0.00000	3.17600	0.00000
11.55	80	1120	0.45600	0.00000	3.17600	0.00000
12.45	130	1121	0.45480	0.00120	3.17080	0.00013
13.11	156	1130	0.44400	0.01080	3.12400	0.00220
15.24	289	1140	0.43200	0.01200	3.07200	0.00049

BRE Value -0.08423180 lit/ sq.m/sec

Average Permeability Value: -0.012004423 lit/ sq.m/sec

Soil Permeability test

TP02

Site North Abbey Road, Shepley - Phase 2

Date

Nov-20

Client Yorkshire Country Properties

Job No.

E19/7465

Pit dimensions m
 Length 2
 Width 0.6
 Depth 1.6

Time	Time into Test Mins	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
10.27	0	1120	0.57600		3.69600	
10.29	2	1120	0.57600	0.00000	3.69600	0.00000
10.36	9	1130	0.56400	0.01200	3.64400	0.00779
10.58	31	1150	0.54000	0.02400	3.54000	0.00506
11.24	57	1177	0.50760	0.03240	3.39960	0.00599
11.56	89	1200	0.48000	0.02760	3.28000	0.00430
12.45	138	1230	0.44400	0.03600	3.12400	0.00382
13.15	168	1245	0.42600	0.01800	3.04600	0.00324
15.24	297	1320	0.33600	0.09000	2.65600	0.00408

BRE Value	0.00391760	lit/ sq.m/sec
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Average Permeability Value:	0.004285114	lit/ sq.m/sec
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Soil Permeability test

TP15

Site North Abbey Road, Shepley - Phase 2

Date

Nov-20

Client Yorkshire Country Properties

Job No.

E19/7465

Pit dimensions m
 Length 2.6
 Width 0.7
 Depth 1.1

Time	Time into Test Mins	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
14.00	0	500	1.09200		5.78000	
14.03	3	500	1.09200	0.00000	5.78000	0.00000
14.09	9	510	1.07380	0.01820	5.71400	0.00880
14.35	34	540	1.01920	0.05460	5.51600	0.00648
15.15	74	560	0.98280	0.03640	5.38400	0.00278
15.30	149	570	0.96460	0.01820	5.31800	0.00076

BRE Value	0.00437320	lit/ sq.m/sec
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Average Permeability Value: 0.003763640	lit/ sq.m/sec
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DRILLING LOG SHEET

SITE: North Abbey Rd - Shepley

CREW INITIALS: 3L + DS

RIG: Sm400

LEAD DRILLER INITIALS

LEAD DRILLER SIGNED

3L

DATE: 26/11/20

SHEET: 1 OF 1

EQUIPMENT USED:

BH	DEPTH	STRATA DESCRIPTION
1	0.00 - 0.30	made ground
	0.30 - 1.40	clay 1mudstone
	1.40 - 18.50	sandstone
	18.50 - 30.00	dark mudstone
2	0.00 - 0.30	made ground
	0.30 - 1.60	clay 1mudstone
	1.60 - 15.00	sandstone
3	0.00 - 0.40	made ground
	0.40 - 1.40	clay 1mudstone
	1.40 - 18.20	sandstone
	18.20 - 21.00	dark mudstone
4	0.00 - 0.40	made ground
	0.40 - 1.50	clay 1mudstone
	1.50 - 20.00	sandstone
	20.00 - 24.00	dark mudstone
5	0.00 - 0.30	made ground
	0.30 - 1.60	clay 1mudstone
	1.60 - 20.20	sandstone
	20.20 - 30.00	dark mudstone

BH	DEPTH	STRATA DESCRIPTION
6	0.00 - 0.40	made ground
	0.40 - 1.70	clay 1mudstone
	1.70 - 20.40	sandstone
	20.40 - 30.00	dark mudstone
Install	0.00 - 0.30	made ground
1	0.30 - 1.50	clay 1mudstone
	1.50 - 3.00	sandstone
	Install piezometer to 3m. 2m slotted and 1m plain	
Install	0.00 - 0.40	made ground
2	0.40 - 1.60	clay 1mudstone
	1.60 - 3.00	sandstone
	Install piezometer to 3m. 2m slotted and 1m plain	

BH	CASING DIA	CASING DEPTH

GAS READING

TOTALS	BH's	DRILL	CASE	CORE
TODAY	8	156		
PREVIOUS				
TO DATE				



DRILLING LOG SHEET

SITE: North Abbey Rd - Shepley

CREW INITIALS: SL + DS

RIG: Sm 400

LEAD DRILLER INITIALS

LEAD DRILLER SIGNED

SL

DATE: 27/11/20

SHEET: 1 OF 2

EQUIPMENT USED:

BH	DEPTH	STRATA DESCRIPTION
7	0.00 - 0.40	made ground
	0.40 - 5.20	soft
	5.20 - 12.00	sandstone
8	0.00 - 2.00	clay / mudstone
	2.00 - 30.00	mudstone / sandstone
9	0.00 - 0.30	made ground
	0.30 - 1.80	clay / mudstone
	1.80 - 10.00	mudstone / sandstone
10	0.00 - 0.30	made ground
	0.30 - 1.70	clay / mudstone
	1.70 - 10.00	mudstone / sandstone
11	0.00 - 0.20	made ground
	0.20 - 1.70	clay / mudstone
	1.70 - 6.00	mudstone
12	0.00 - 5.50	soft
	5.50 - 4.00	sandstone

BH	DEPTH	STRATA DESCRIPTION
13	0.00 - 0.40	made ground
	0.40 - 1.50	clay / mudstone
	1.50 - 21.40	mudstone / sandstone
	21.40 - 30.00	dark mudstone
14	0.00 - 0.30	made ground
	0.30 - 1.60	clay / mudstone
	1.60 - 20.80	mudstone / sandstone
	20.80 - 30.00	dark mudstone
15	0.00 - 0.40	made ground
	0.40 - 1.50	clay / mudstone
	1.50 - 21.00	mudstone / sandstone
	21.00 - 30.00	dark mudstone
16	0.00 - 0.30	made ground
	0.30 - 1.40	clay / mudstone
	1.40 - 15.00	sandstone

BH	CASING DIA	CASING DEPTH

GAS READING

TOTALS	BH's	DRILL	CASE	CORE
TODAY				
PREVIOUS				
TO DATE				



CREW INITIALS: SL + DS RIG: sm400

DATE: 27/11/20

SHEET: 2 OF 2

EQUIPMENT USED:

LEAD DRILLER INITIALS	LEAD DRILLER SIGNED
32	

BH	DEPTH	STRATA DESCRIPTION
Install 3	0.00 - 0.30 0.30 - 1.50 1.50 - 3.00	made ground clay 1 mudstone sandstone
	Install piezometer to 3m. 2m slotted and 1m plain	
Install 4	0.00 - 3.00	silt
	Install piezometer to 3m. 2m slotted and 1m plain	
Install S	0.00 - 0.40 0.40 - 1.40 1.40 - 3.00	made ground clay 1 mudstone sandstone
	Install piezometer to 3m. 2m slotted and 1m plain	

BH	CASING DIA	CASING DEPTH

GAS READING	

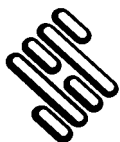
[illegible]

TOTALS	BH's	DRILL	CASE	CORE
TODAY	13	141		
PREVIOUS	8	156		
TO DATE	21	347		

APPENDIX C

Geotechnical Analysis

Chemical Analysis of Samples



STRUCTURAL SOILS LTD
TEST REPORT



Report No. 784782 r1

1774

Date 16-December-2020 Contract Shepley phase 2

Client Haigh Huddleston Associates
Address Firth Building
99-101 Leeds Road
Dewsbury
WF12 7BU

For the Attention of Martin Huddleston

Samples submitted by client 01/12/2020
Testing Started 04/12/2020
Testing Completed 16/12/2020

Client Reference
Client Order No.
Instruction Type Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests Undertaken

Moisture Content (oven drying method) BS1377:Part 2:1990,clause 3.2 (superseded)**
Liquid Limit (definitive method) BS1377:Part 2:1990,clause 4.3
Plastic Limit BS1377:Part 2:1990,clause 5.3
Plasticity Index Derivation BS1377:Part 2:1990,clause 5.4

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.

Test were undertaken on samples 'as received' unless otherwise stated.

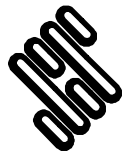
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail mark.athorne@soils.co.uk

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
TP05		B	0.60	26	45	21	24	85	Brown grey slightly sandy slightly gravelly CLAY
TP11		B	0.50	19	55	27	28	80	Brown grey slightly sandy slightly gravelly CLAY
TP13		B	0.40	27	49	23	26	92	Brown slightly sandy slightly gravelly CLAY



**STRUCTURAL
SOILS LTD**

Contract:

Shepley Phase 2

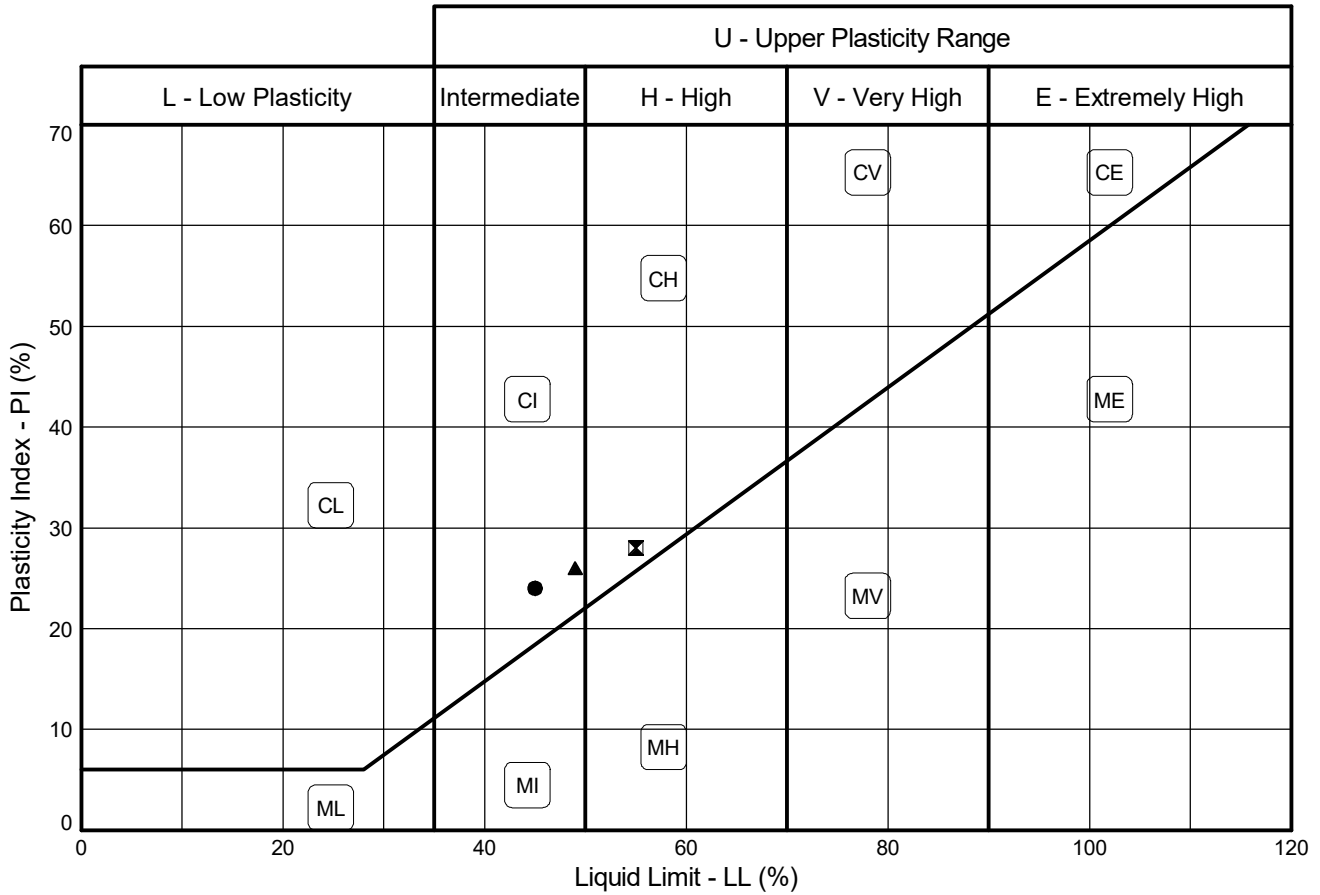
Contract Ref:

784782



PLASTICITY CHART - PI Vs LL

In accordance with BS5930:2015
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425µm %	Lab location	Notes
Exploratory Position ID	Sample	Depth (m)										
●	TP05	B	0.60	3.2/4.3/5.3/5.4	4.2.4	26	45	21	24	85	C	
⊠	TP11	B	0.50	3.2/4.3/5.3/5.4	4.2.4	19	55	27	28	80	C	
▲	TP13	B	0.40	3.2/4.3/5.3/5.4	4.2.4	27	49	23	26	92	C	

Tested in accordance with the following clauses of BS1377-2:1990.

- 3.2 - Moisture Content
- 4.3 - Cone Penetrometer Method
- 4.4 - One Point Cone Penetrometer Method
- 4.6 - One Point Casagrande Method
- 5.3 - Plastic Limit Method
- 5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

- 4.2.3 - Natural State
- 4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By

[Signature]

Contract

Shepley Phase 2

Date

16/12/20

Contract Ref:

784782

TESTING VERIFICATION CERTIFICATE



1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **28/01/2021 09:06:18**.

Testing reported after this date is not covered by this Verification Certificate.

Approved Signatory
Luke Fisher (Materials Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
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18 Frogmore Road
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Hertfordshire
HP3 9RT

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Anerley Court, Half Moon Lane
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**STRUCTURAL
SOILS LTD**

Contract:

Shepley Phase 2

Job No:

784782





DETS

Certificate of Analysis

Certificate Number 20-24820

Issued: 11-Dec-20

Client Haigh Huddleston & Associates Ltd
Firth Buildings
99-101 Leeds Road
Dewsbury
WF12 7BU

Our Reference 20-24820

Client Reference 7465

Order No (not supplied)

Contract Title Shepley Phase 2

Description 12 Soil samples.

Date Received 03-Dec-20

Date Started 03-Dec-20

Date Completed 11-Dec-20

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 20-24820

Client Ref 7465

Contract Title Shepley Phase 2

Sample ID	Depth	Lab No	Completed	Matrix Description
TP01	0.2	1771607	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP03	0.3	1771608	11/12/2020	Dark brown slightly gravelly, sandy CLAY including numerous rootlets
TP05	0.2	1771609	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP08	0.3	1771610	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP09	0.2	1771611	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP11	0.2	1771612	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP15	0.2	1771613	11/12/2020	Dark brown slightly gravelly, very sandy CLAY including odd rootlets
TP04	0.8	1771614	11/12/2020	Brown gravelly, sandy CLAY
TP08	0.6	1771615	11/12/2020	Dark brown gravelly, sandy CLAY
TP12	0.7	1771616	11/12/2020	Brown sandy CLAY including odd rootlets
TP02	0.6	1771617	11/12/2020	Dark brown gravelly, sandy CLAY
TP16	0.6	1771618	11/12/2020	Brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 20-24820

Client Ref 7465

Contract Title Shepley Phase 2

Lab No	1771607	1771608	1771609	1771610
Sample ID	TP01	TP03	TP05	TP08
Depth	0.20	0.30	0.20	0.30
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	26/11/2020	26/11/2020	26/11/2020	26/11/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	210	70	24	25
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.3	0.2
Chromium	DETSC 2301#	0.15	mg/kg	58	28	38	31
Copper	DETSC 2301#	0.2	mg/kg	34	33	35	50
Lead	DETSC 2301#	0.3	mg/kg	59	53	68	48
Mercury	DETSC 2325#	0.05	mg/kg	2.3	0.10	0.33	0.16
Nickel	DETSC 2301#	1	mg/kg	20	18	24	30
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.7	0.9	< 0.5
Zinc	DETSC 2301#	1	mg/kg	99	71	110	94
Inorganics							
pH	DETSC 2008#		pH	6.2	5.9	6.2	5.7
Thiocyanate	DETSC 2130#	0.6	mg/kg	1.0	1.7	< 0.6	< 0.6
Sulphide	DETSC 2024*	10	mg/kg	12	12	< 10	< 10
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.06	0.08	0.09	0.06
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.4	0.2	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.3	0.2	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.2	0.2	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.1	0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.3	0.3	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.1	0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	2.5	1.7	< 1.6	< 1.6
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3	0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-24820

Client Ref 7465

Contract Title Shepley Phase 2

Lab No	1771611	1771612	1771613	1771614	1771615
Sample ID	TP09	TP11	TP15	TP04	TP08
Depth	0.20	0.20	0.20	0.80	0.60
Other ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	26/11/2020	27/11/2020	27/11/2020	26/11/2020	26/11/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	270	87	28	100	18
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3	0.3	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	38	38	230	33	29
Copper	DETSC 2301#	0.2	mg/kg	54	41	84	17	43
Lead	DETSC 2301#	0.3	mg/kg	100	89	170	24	27
Mercury	DETSC 2325#	0.05	mg/kg	0.25	0.20	5.1	0.13	0.14
Nickel	DETSC 2301#	1	mg/kg	20	19	18	19	35
Selenium	DETSC 2301#	0.5	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	110	94	140	61	85
Inorganics								
pH	DETSC 2008#		pH	6.2	5.5	6.3	7.1	6.5
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	2.2	2.0	< 0.6	< 0.6
Sulphide	DETSC 2024*	10	mg/kg	< 10	36	< 10	< 10	< 10
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.09	0.10	0.10	0.02	0.03
PAHs								
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.1	0.2	1.6	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.2	0.2	1.3	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.8	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.9	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.5	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.8	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.4	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	7.8	< 1.6	< 1.6
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-24820

Client Ref 7465

Contract Title Shepley Phase 2

Lab No	1771616	1771617	1771618
Sample ID	TP12	TP02	TP16
Depth	0.70	0.60	0.60
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	27/11/2020	26/11/2020	27/11/2020
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	9.5	41	28
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	27	36	33
Copper	DETSC 2301#	0.2	mg/kg	26	22	23
Lead	DETSC 2301#	0.3	mg/kg	15	30	16
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.34	0.10
Nickel	DETSC 2301#	1	mg/kg	23	18	26
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	61	54	72
Inorganics						
pH	DETSC 2008#		pH	6.3	6.8	6.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	0.7	< 0.6
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.03	0.03	0.04
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 20-24820

Client Ref 7465

Contract Title Shepley Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1771607	TP01 0.20	SOIL	NAD	none	Deborah Milburn
1771608	TP03 0.30	SOIL	NAD	none	Deborah Milburn
1771609	TP05 0.20	SOIL	NAD	none	Deborah Milburn
1771610	TP08 0.30	SOIL	NAD	none	Deborah Milburn
1771611	TP09 0.20	SOIL	NAD	none	Deborah Milburn
1771612	TP11 0.20	SOIL	NAD	none	Deborah Milburn
1771613	TP15 0.20	SOIL	NAD	none	Deborah Milburn
1771614	TP04 0.80	SOIL	NAD	none	Deborah Milburn
1771615	TP08 0.60	SOIL	NAD	none	Deborah Milburn
1771616	TP12 0.70	SOIL	NAD	none	Deborah Milburn

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 20-24820
Client Ref 7465
Contract Shepley Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1771607	TP01 0.20 SOIL	26/11/20	GJ 250ml, PT 1L		
1771608	TP03 0.30 SOIL	26/11/20	GJ 250ml, PT 1L		
1771609	TP05 0.20 SOIL	26/11/20	GJ 250ml, PT 1L		
1771610	TP08 0.30 SOIL	26/11/20	GJ 250ml, PT 1L		
1771611	TP09 0.20 SOIL	26/11/20	GJ 250ml, PT 1L		
1771612	TP11 0.20 SOIL	27/11/20	GJ 250ml, PT 1L		
1771613	TP15 0.20 SOIL	27/11/20	GJ 250ml, PT 1L		
1771614	TP04 0.80 SOIL	26/11/20	GJ 250ml, PT 1L		
1771615	TP08 0.60 SOIL	26/11/20	GJ 250ml, PT 1L		
1771616	TP12 0.70 SOIL	27/11/20	GJ 250ml, PT 1L		
1771617	TP02 0.60 SOIL	26/11/20	GJ 250ml, PT 1L		
1771618	TP16 0.60 SOIL	27/11/20	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS 2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

APPENDIX D

Coal Authority Report

Geological Report



The Coal
Authority

CON29M

coal mining report

ABBAY ROAD, SHEPLEY, HUDDERSFIELD, KIRKLEES, HD8 8BX



Known or potential coal mining risks

Past underground coal mining	Page 4
Future underground coal mining	Page 4
Mine entries	Page 5



Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit
www.groundstability.com



Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see **page 3** for further details on **Future development**.

Your reference: **YCP 7465**
Our reference: **51002302627001**
Date: **30 September 2020**

Client name:
**HAIGH HUDDLESTON &
ASSOCIATES**

If you require any further assistance please
contact our experts on:
0345 762 6848
groundstability@coal.gov.uk



The Law
Society

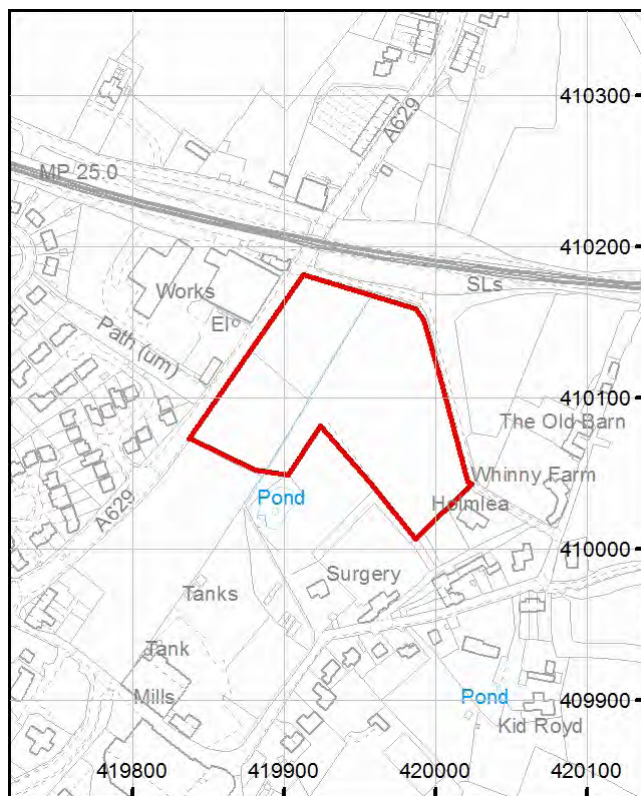
Enquiry boundary

Key

Approximate position of enquiry boundary shown



We can confirm that the location is
on the coalfield



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This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.



Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Professional opinion



Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on **0345 762 6848** or email **cmra@coal.gov.uk**.

Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

The Coal Authority owns the copyright in this report and the information used to produce this report is protected by our database rights. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

1 Past underground coal mining

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

However the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

2 Present underground coal mining

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

3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

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

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

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

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

4 Mine entries

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

This information is based on the information that the Coal Authority has at the time of this enquiry.

Based on the Coal Authority's knowledge of the mining circumstances at the time of this enquiry, there may be unrecorded mine entries in the local area that do not appear on Coal Authority records.

5 Coal mining geology

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

6 Past opencast coal mining

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

7 Present opencast coal mining

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

8 Future opencast coal mining

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

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

9 Coal mining subsidence

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

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

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

10 Mine gas

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

11 Hazards related to coal mining

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

12 Withdrawal of support

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

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

13 Working facilities order

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

14 Payments to owners of former copyhold land

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

Statutory cover



Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.

www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form



Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call **01623 646 333**. Further information can be found on our website: www.gov.uk/coalauthority.

Glossary



Key terms

adit - horizontal or sloped entrance to a mine

coal mining subsidence - ground movement caused by the removal of coal by underground mining

Coal Mining Subsidence Act 1991 - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

coal mining subsidence damage - damage to land, buildings or structures caused by the removal of coal by underground mining

coal seams - bed of coal of varying thickness

future opencast coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

future underground coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

mine entries - collective name for shafts and adits

payments to owners of former copyhold land - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

shaft - vertical entry into a mine

site investigation - investigations of coal mining risks carried out with the Coal Authority's permission

stop notice - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

subsidence claim - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

working facilities orders - a court order which gave permission, restricted or prevented coal mine workings

Haigh Huddleston & Associates

99-101, LEEDS ROAD,
DEWSBURY, WF12 7BU

Groundsure
Reference:

GS-6047537

Your Reference:

YORKSHIRE_COUNTRY_PROPERTIES_
7465

Report Date

22 May 2019

Report Delivery
Method:

Email - pdf

Geo Insight

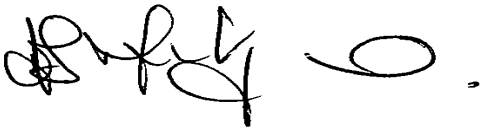
Address: 419815, 410001,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Address: 419815, 410001,
Date: 22 May 2019
Reference: GS-6047537
Client: Haigh Huddleston & Associates



Aerial Photograph Capture date: 29-Jun-2018
Grid Reference: 419815,410001
Site Size: 0.8858ha

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Overview of Findings

The Groundsure Geo Insight 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 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

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

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	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 of linear features within 500m of the study site boundary at 1:10,000 scale?	Yes

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	No
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	No
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

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

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

Yes

Section 3: Radon

3. Radon

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

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

3.2 Radon Protection

No radon protective measures are necessary.

Section 4: Ground Workings

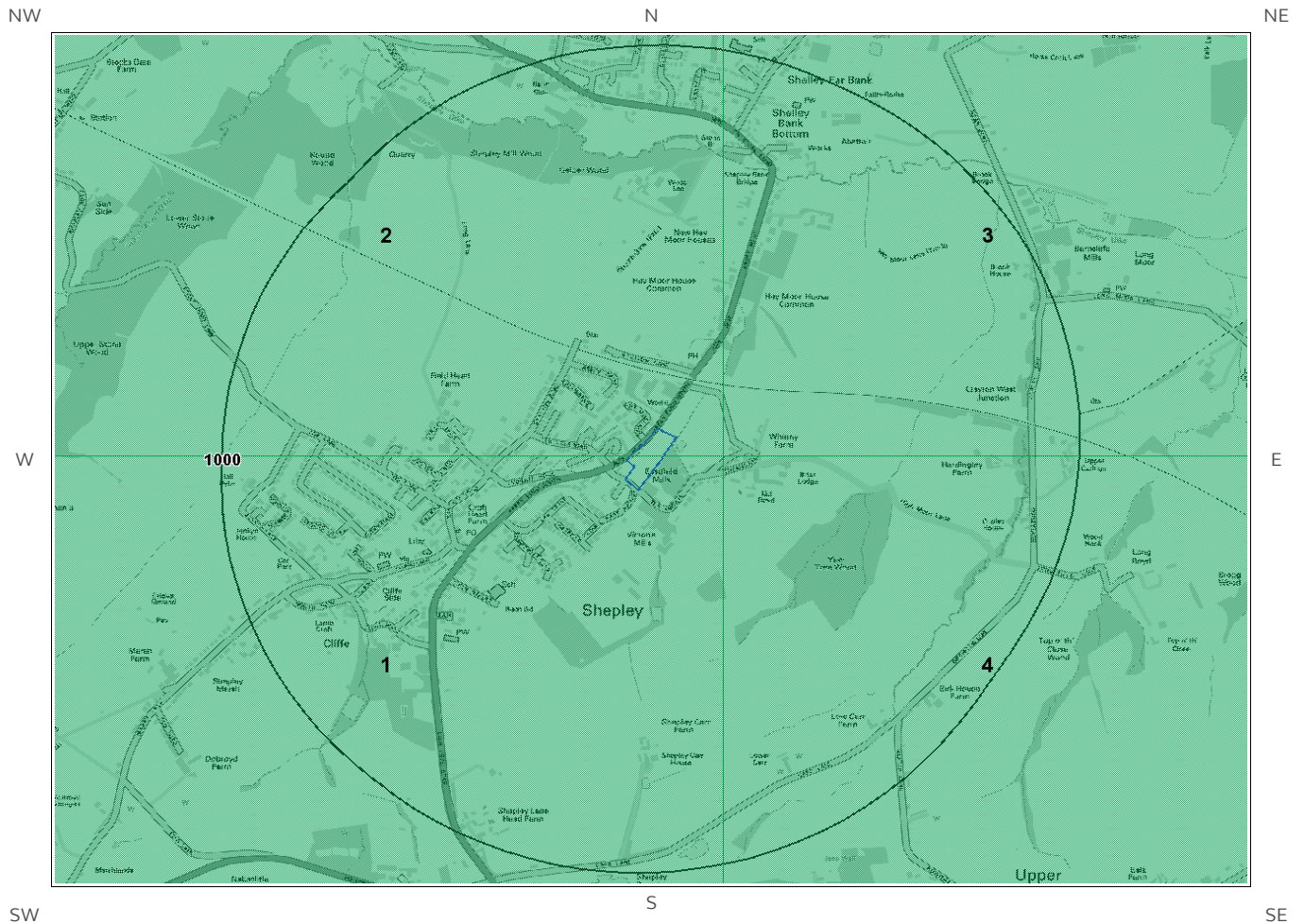
	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	1	16	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	14
4.3 Current Ground Workings	0	0	1	2	10

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	14
5.2 Coal Mining	1	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	0	0	0	0	0
5.5 Non-Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

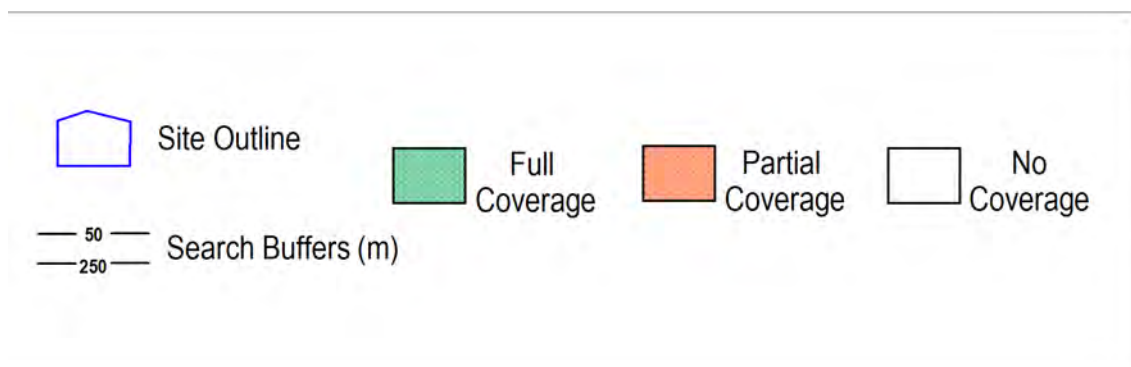
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Very Low				
6.2 Landslides	Very Low				
6.3 Ground Dissolution of Soluble Rocks	Negligible				
6.4 Compressible Deposits	Negligible				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Negligible				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	0	2	5		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	3	3	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	0	0	9	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	0	14	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	Some deposits are mapped
2	0.0	Some deposits are mapped	Full	Full	Some deposits are mapped
3	115.0	Some deposits are mapped	Full	Full	Some deposits are mapped
4	124.0	Some deposits are mapped	Full	Full	Some deposits are mapped

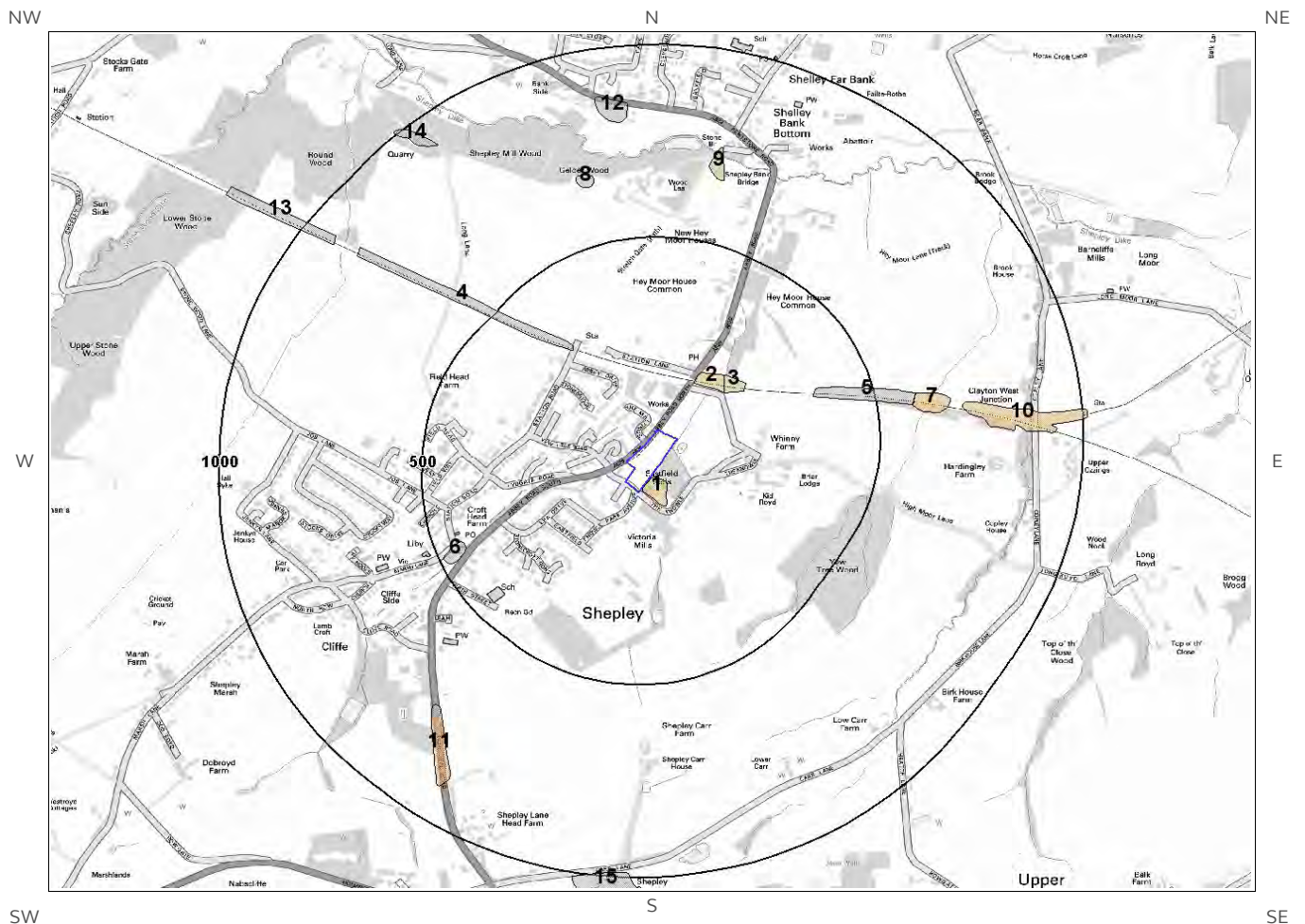
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

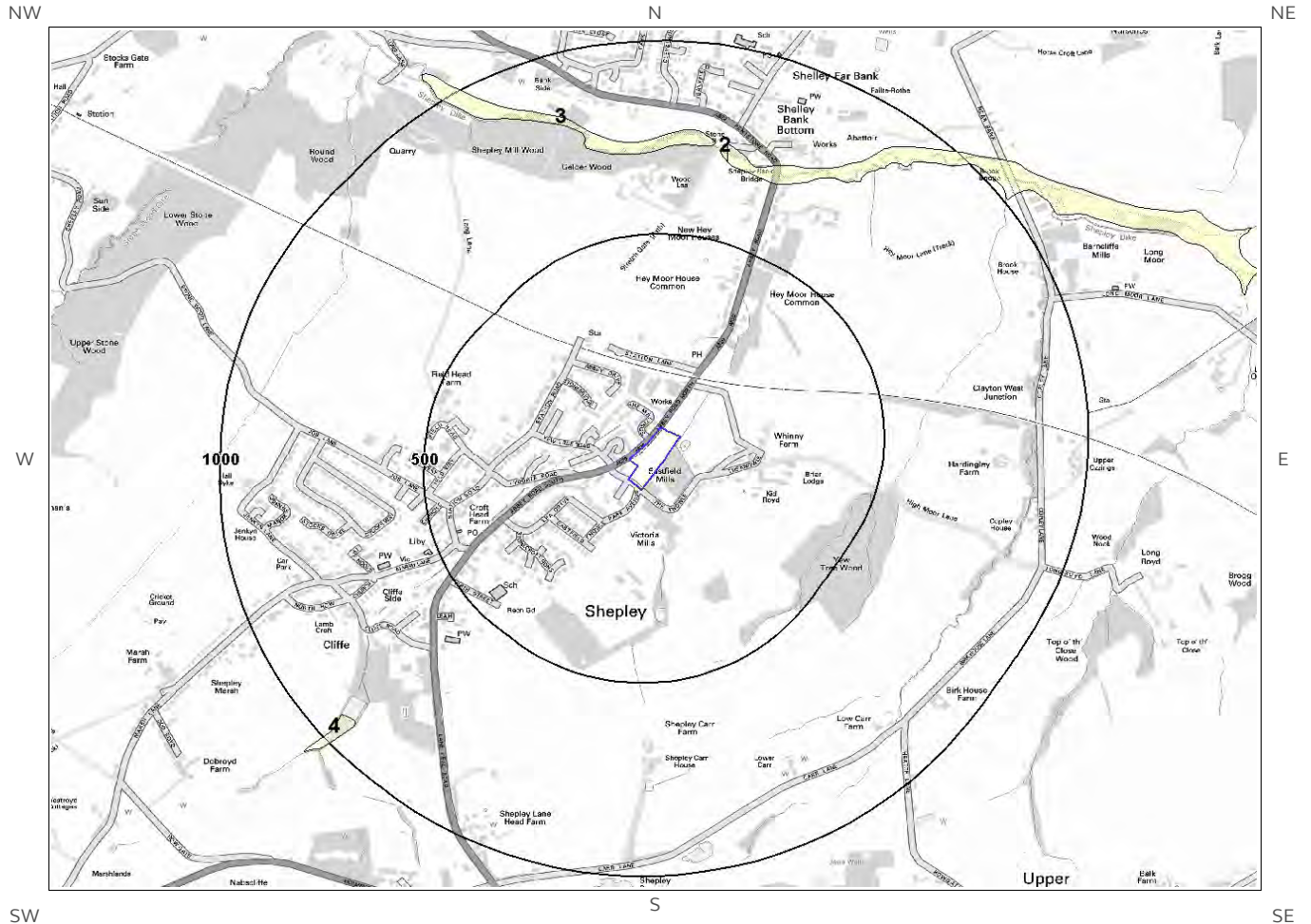
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

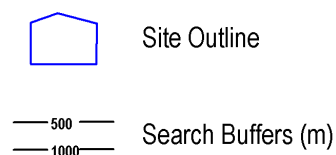
ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	148.0	NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	166.0	NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	295.0	NW	WGR-VOID	Worked Ground (Undivided)	Void
5	353.0	E	WGR-VOID	Worked Ground (Undivided)	Void
6	428.0	W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

1.2.2 Landslip

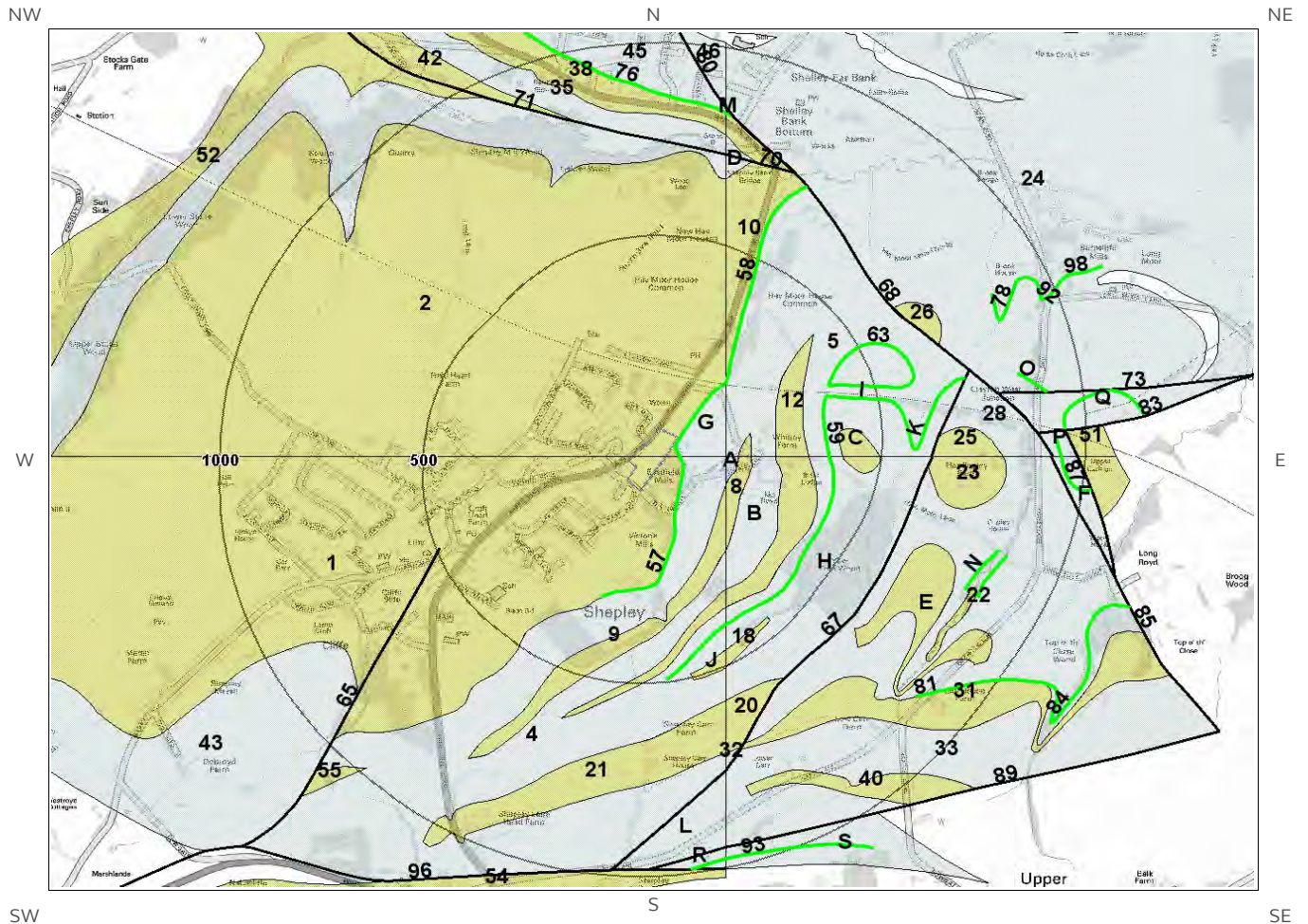
Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

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 1:10,000 scale

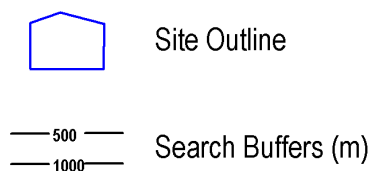
This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

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1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	GR-SDST	Grenoside Sandstone - Sandstone	Langsettian Sub-age
2	0.0	On Site	GR-SDST	Grenoside Sandstone - Sandstone	Langsettian Sub-age
3G	3.0	SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
4	28.0	SE	PLCM-MDSI	Pennine Lower Coal Measures Formation - Mudstone And Siltstone	Langsettian Sub-age
5	115.0	E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
6A	124.0	SE	PLCM-MDSI	Pennine Lower Coal Measures Formation - Mudstone And Siltstone	Langsettian Sub-age
7A	153.0	E	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
8	153.0	E	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
9	162.0	SE	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
10	182.0	NE	GR-SDST	Grenoside Sandstone - Sandstone	Langsettian Sub-age
11B	184.0	E	PLCM-MDSI	Pennine Lower Coal Measures Formation - Mudstone And Siltstone	Langsettian Sub-age
12	237.0	E	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
13B	243.0	E	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
14H	322.0	E	PLCM-MDSI	Pennine Lower Coal Measures Formation - Mudstone And Siltstone	Langsettian Sub-age
15	328.0	SE	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
16C	391.0	E	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
17C	404.0	E	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
18	450.0	SE	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age
19J	461.0	SE	PF-SDST	Penistone Flags - Sandstone	Langsettian Sub-age

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	Category Description	Feature Description
56G	3.0	SE	ROCK	Coal seam, inferred
57	28.0	SE	ROCK	Coal seam, inferred ()
58	182.0	NE	ROCK	Coal seam, inferred
59	359.0	E	ROCK	Coal seam, inferred

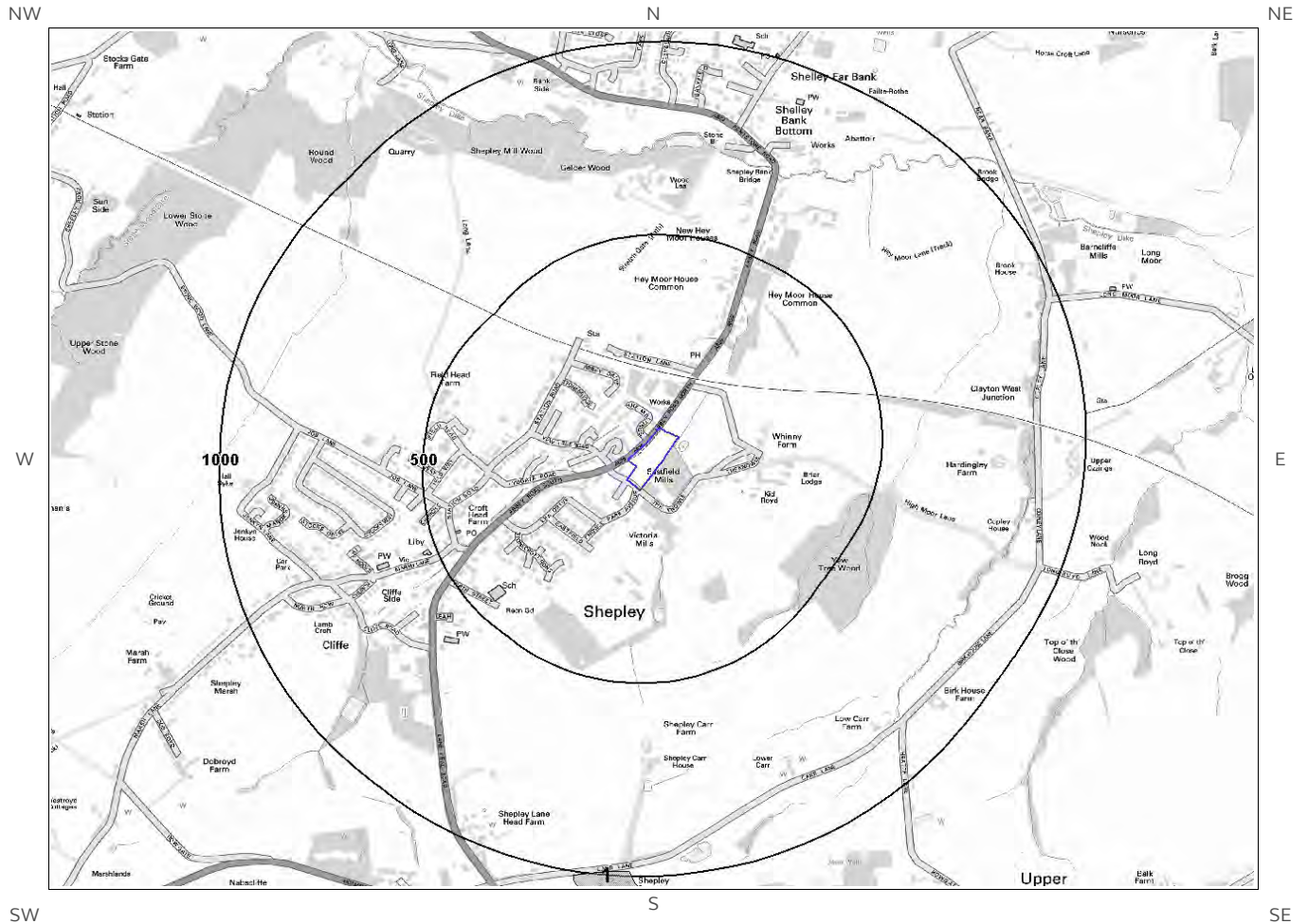
ID	Distance (m)	Direction	Category Description	Feature Description
60H	373.0	E	ROCK	Coal seam, inferred ()
61I	379.0	E	ROCK	Coal seam, observed
62I	391.0	E	ROCK	Coal seam, observed
63	391.0	E	ROCK	Coal seam, inferred
64J	406.0	SE	ROCK	Coal seam, inferred ()
65	492.0	W	FAULT	Normal fault, inferred; crossmarks on downthrow side

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

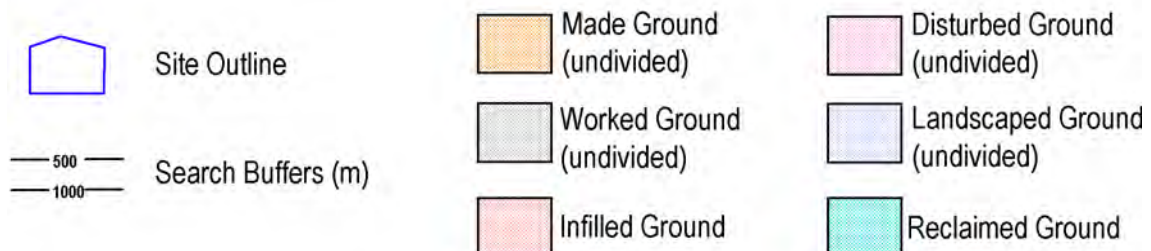
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 086

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? No

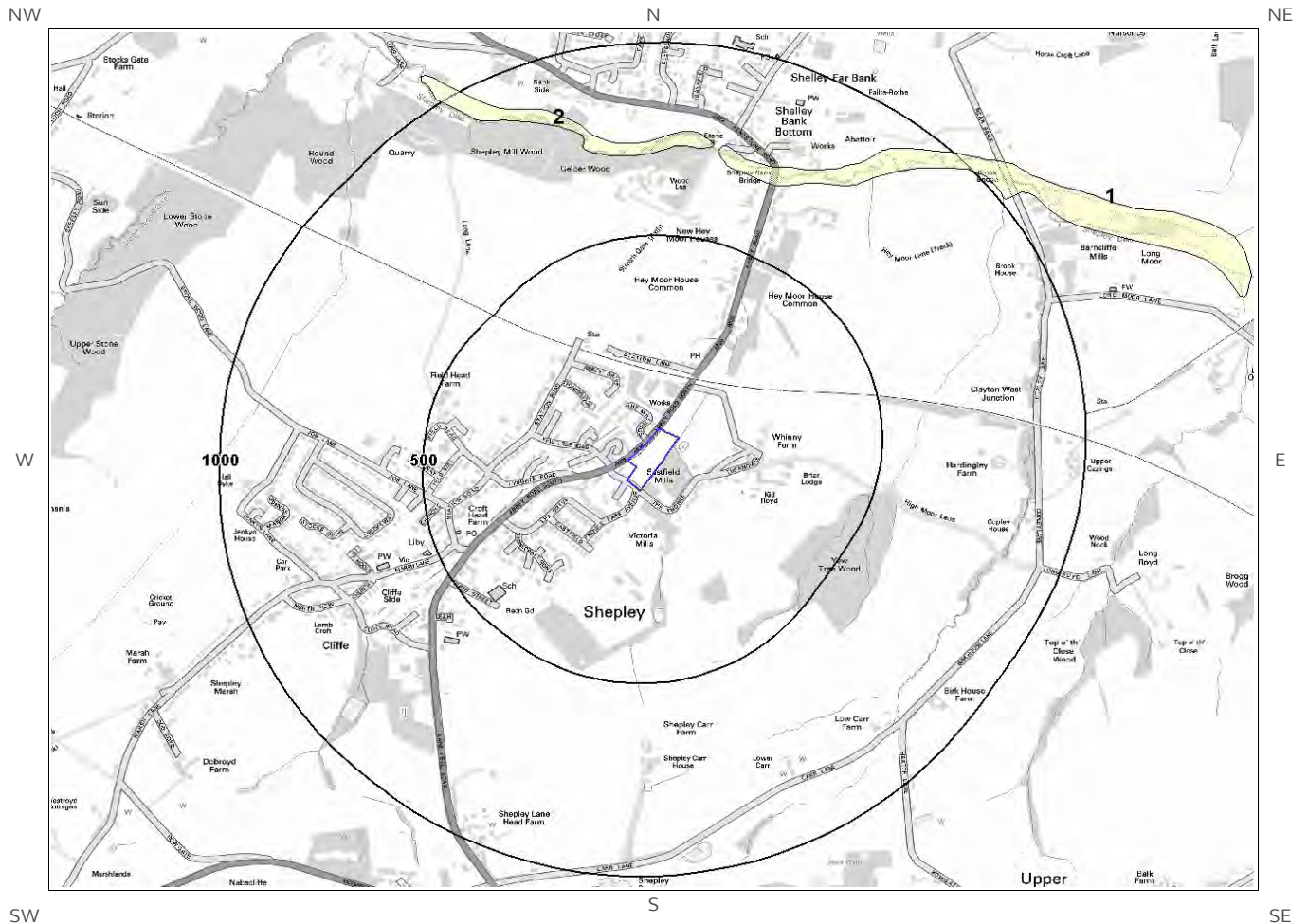
Database searched and no data found.

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

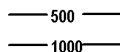
2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? No

Database searched and no data found.

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? No

Database searched and no data found.

2.2.3 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.

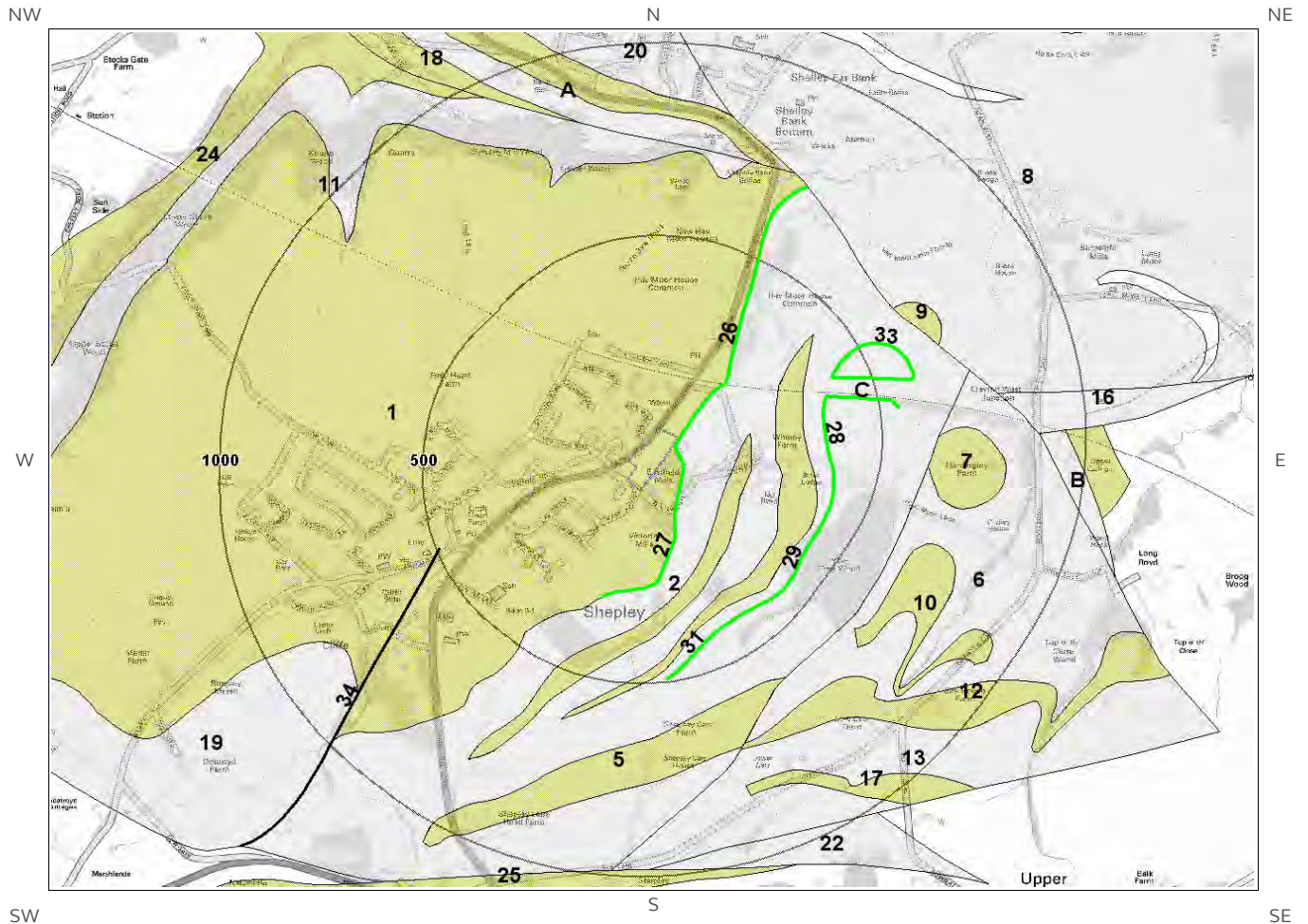
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

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

Database searched and no data found.

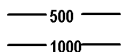
2.3 Bedrock and linear features map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 086

2.3.1 Bedrock/Solid Geology

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

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	GR-SDST	GRENOSIDE SANDSTONE - SANDSTONE	WESTPHALIAN
2	3.0	SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
3	153.0	E	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN
4	238.0	E	PF-SDST	PENISTONE FLAGS - SANDSTONE	WESTPHALIAN

2.3.2 Permeability of Bedrock Ground

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

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	High	Moderate
0.0	On Site	Fracture	High	Moderate
3.0	SE	Fracture	High	Low
28.0	SE	Fracture	High	Low

2.3.3 Linear features

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

ID	Distance	Direction	Category Description	Feature Description
26	3.0	SE	ROCK	Coal seam, inferred
27	28.0	SE	ROCK	Coal seam, inferred
28	359.0	E	ROCK	Coal seam, inferred
29	373.0	E	ROCK	Coal seam, inferred
30C	378.0	E	ROCK	Coal seam, observed
31	405.0	SE	ROCK	Coal seam, inferred
32C	406.0	E	ROCK	Coal seam, observed
33	406.0	E	ROCK	Coal seam, inferred
34	492.0	W	FAULT	Fault, inferred

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

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

3 Radon Data

3.1 Radon Affected Areas

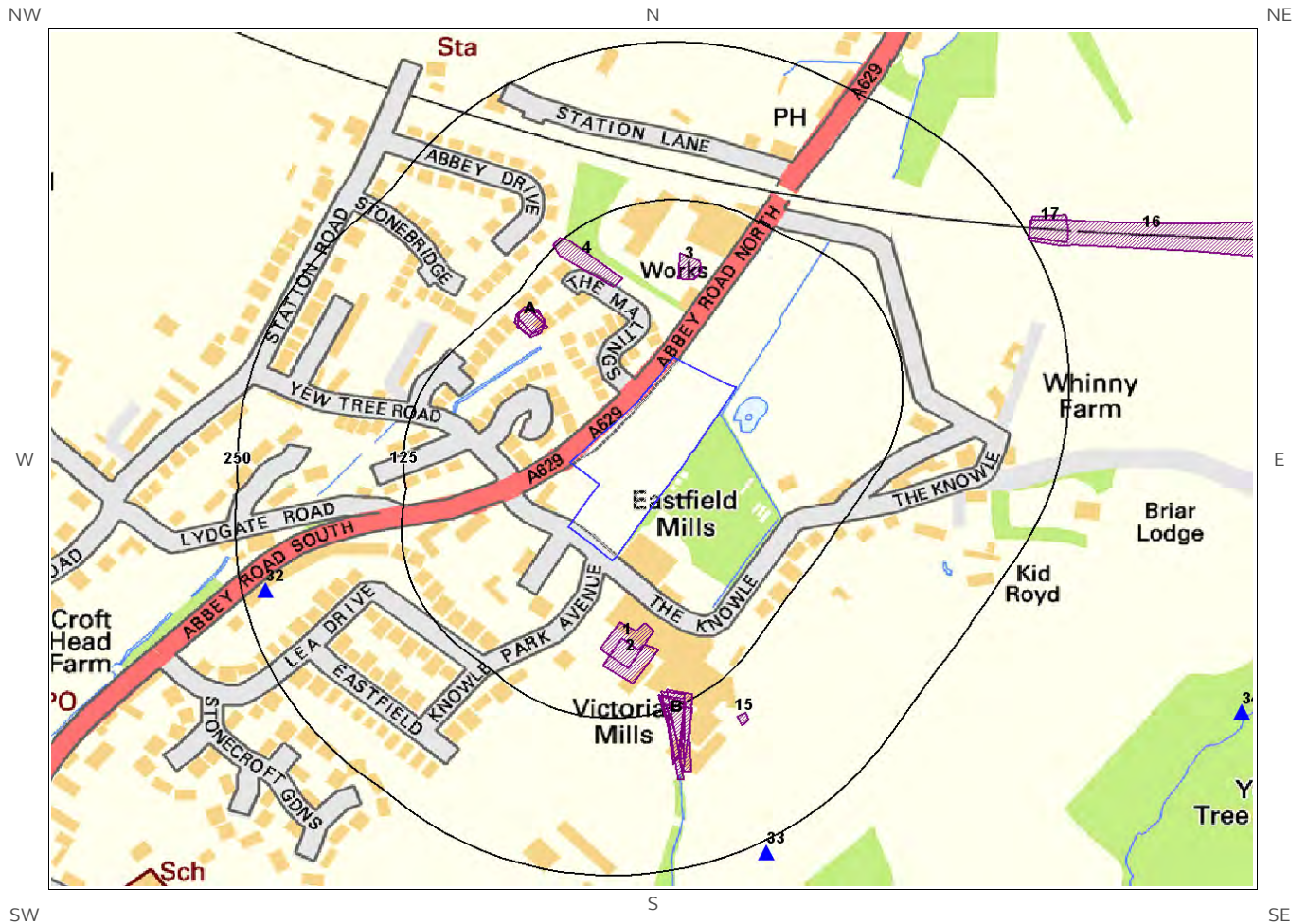
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

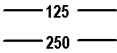
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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- | | | | |
|---|--------------------|---|----------------------------------|
|  | Site Outline |  | Historic Surface Ground Workings |
|  | Search Buffers (m) |  | Historic Underground Workings |
| | |  | Current Ground Workings |

4 Ground Workings

4.1 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

ID	Distance (m)	Direction	NGR	Use	Date
1	49.0	S	419801 409844	Pond	1970
2	62.0	S	419806 409831	Pond	1892
3	62.0	N	419850 410145	Unspecified Pit	1968
4	72.0	NW	419774 410148	Refuse Heap	1904
5A	90.0	NW	419731 410100	Unspecified Heap	1948
6A	90.0	NW	419731 410100	Unspecified Heap	1951
7A	94.0	NW	419731 410103	Unspecified Heap	1932
8A	94.0	NW	419731 410103	Unspecified Heap	1932
9B	110.0	S	419838 409780	Pond	1970
10B	111.0	S	419842 409776	Pond	1955
11B	112.0	S	419836 409777	Reservoir	1904
12B	112.0	S	419836 409777	Reservoir	1948
13B	113.0	S	419837 409770	Reservoir	1932
14B	121.0	S	419842 409769	Pond	1892
15	155.0	SE	419890 409785	Reservoir	1955
16	248.0	NE	420236 410164	Cuttings	1948
17	250.0	NE	420119 410174	Cuttings	1951

4.2 Historical Underground Working Features derived from Historical Mapping

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

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

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	579.0	E	420468 410026	Unspecified Old Shaft	1948
Not shown	579.0	E	420467 410030	Unspecified Old Shaft	1951
Not shown	590.0	SE	420383 409726	Coal Shaft	1951
Not shown	592.0	SE	420384 409724	Coal Shaft	1948
Not shown	592.0	E	420483 410028	Unspecified Disused Shaft	1967
Not shown	596.0	E	420484 410100	Unspecified Old Level	1951
Not shown	628.0	E	420514 410100	Unspecified Old Level	1948
Not shown	628.0	E	420514 410102	Unspecified Old Level	1951
Not shown	726.0	SE	420259 409300	Disused Colliery	1951
Not shown	729.0	SE	420234 409281	Disused Colliery	1948
Not shown	733.0	SE	420172 409280	Unspecified Old Shaft	1951
Not shown	734.0	SE	420171 409278	Unspecified Old Shaft	1948
Not shown	758.0	SE	420277 409318	Unspecified Old Level	1951
Not shown	762.0	SE	420278 409314	Unspecified Old Level	1948

4.3 Current Ground Workings

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

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

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

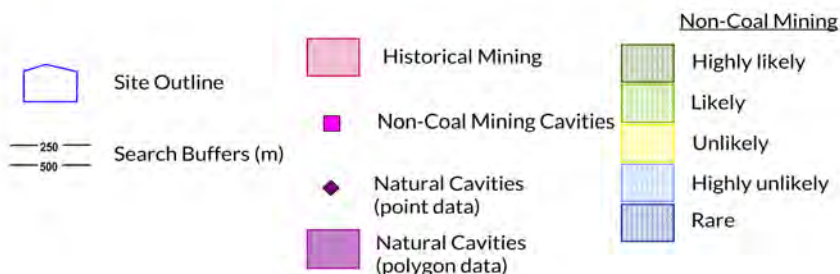
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
32	233.0	W	419531 409887	Sandstone	Shepley	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
33	259.0	SE	419907 409679	Coal, Deep	Healey House Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
34	459.0	SE	420265 409790	Sandstone	Yew Tree Wood	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	589.0	SE	420384 409735	Coal, Deep	Yew Tree Wood 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	597.0	E	420482 410035	Coal, Deep	Hardenley 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	632.0	E	420515 410101	Coal, Deep	Hardenley 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	690.0	N	419633 410731	Sandstone	Gelder Wood	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	739.0	SE	420178 409281	Coal, Deep	Low Carr Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	768.0	SE	420281 409318	Coal, Deep	Low Carr Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	822.0	N	419827 410894	Sandstone	Town's	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	833.0	N	419706 410895	Sandstone	Shelley Far Bank	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	948.0	NW	419255 410820	Sandstone	Long Lane Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	971.0	N	419543 410998	Sandstone	Town's	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 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
1A	579.0	E	420468 410026	Unspecified Old Shaft	1948
2A	579.0	E	420467 410030	Unspecified Old Shaft	1951
3B	590.0	SE	420383 409726	Coal Shaft	1951
4B	592.0	SE	420384 409724	Coal Shaft	1948
5A	592.0	E	420483 410028	Unspecified Disused Shaft	1967
6	596.0	E	420484 410100	Unspecified Old Level	1951
7C	628.0	E	420514 410100	Unspecified Old Level	1948
8C	628.0	E	420514 410102	Unspecified Old Level	1951
9	726.0	SE	420259 409300	Disused Colliery	1951
Not shown	729.0	SE	420234 409281	Disused Colliery	1948
Not shown	733.0	SE	420172 409280	Unspecified Old Shaft	1951
Not shown	734.0	SE	420171 409278	Unspecified Old Shaft	1948
Not shown	758.0	SE	420277 409318	Unspecified Old Level	1951
Not shown	762.0	SE	420278 409314	Unspecified Old Level	1948

5.2 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 site lies in or in proximity to the coal mining reporting area as defined by the Coal Authority

5.3 Johnson Poole and Bloomer

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

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

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 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? No

Database searched and no data found.

5.5 Non-Coal Mining Cavities

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

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

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

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Cheshire Brine Subsidence Compensation Board.

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

Database searched and no data found.

5.8 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.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

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

Database searched and no data found.

5.10 Clay Mining

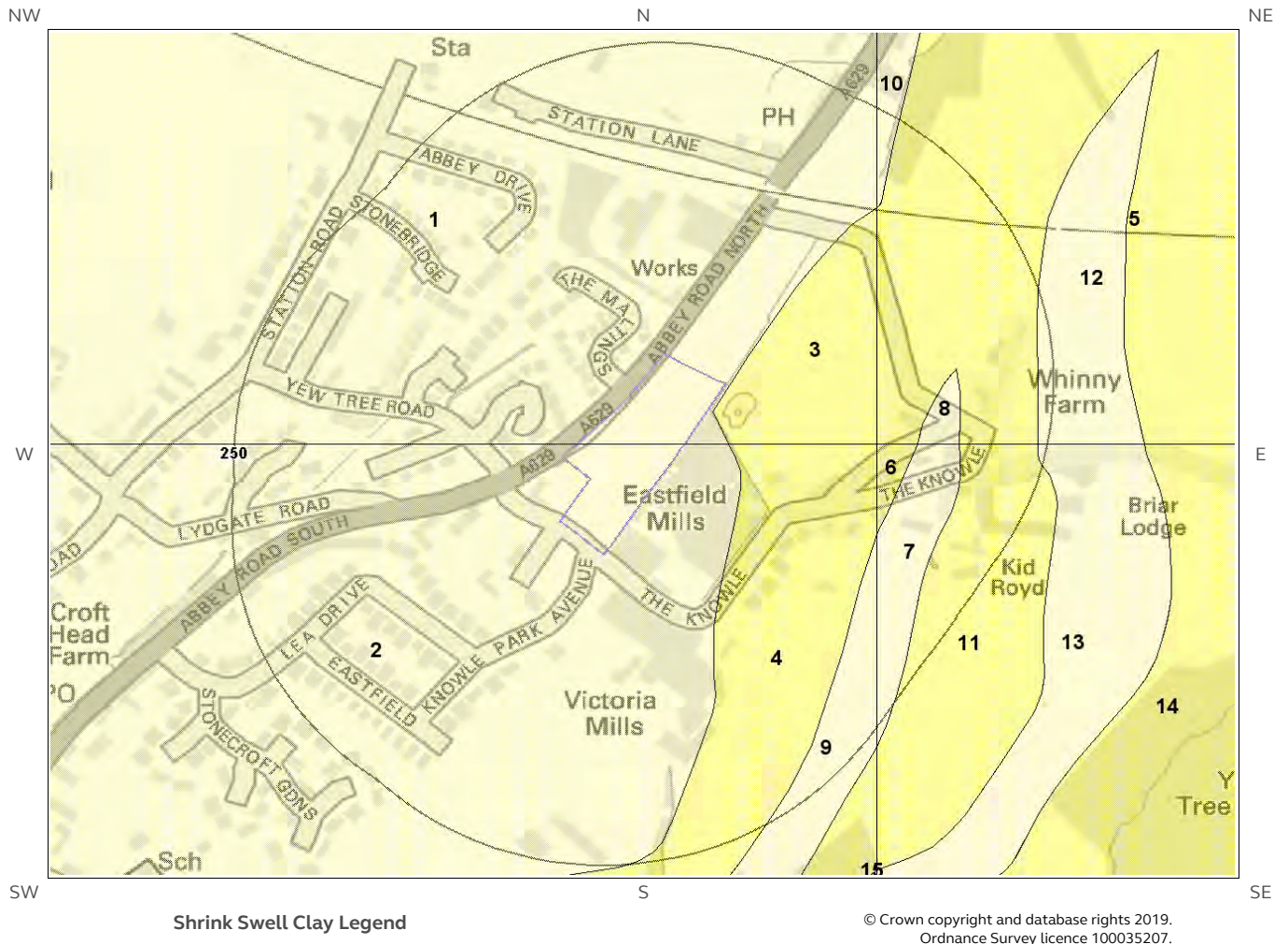
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

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

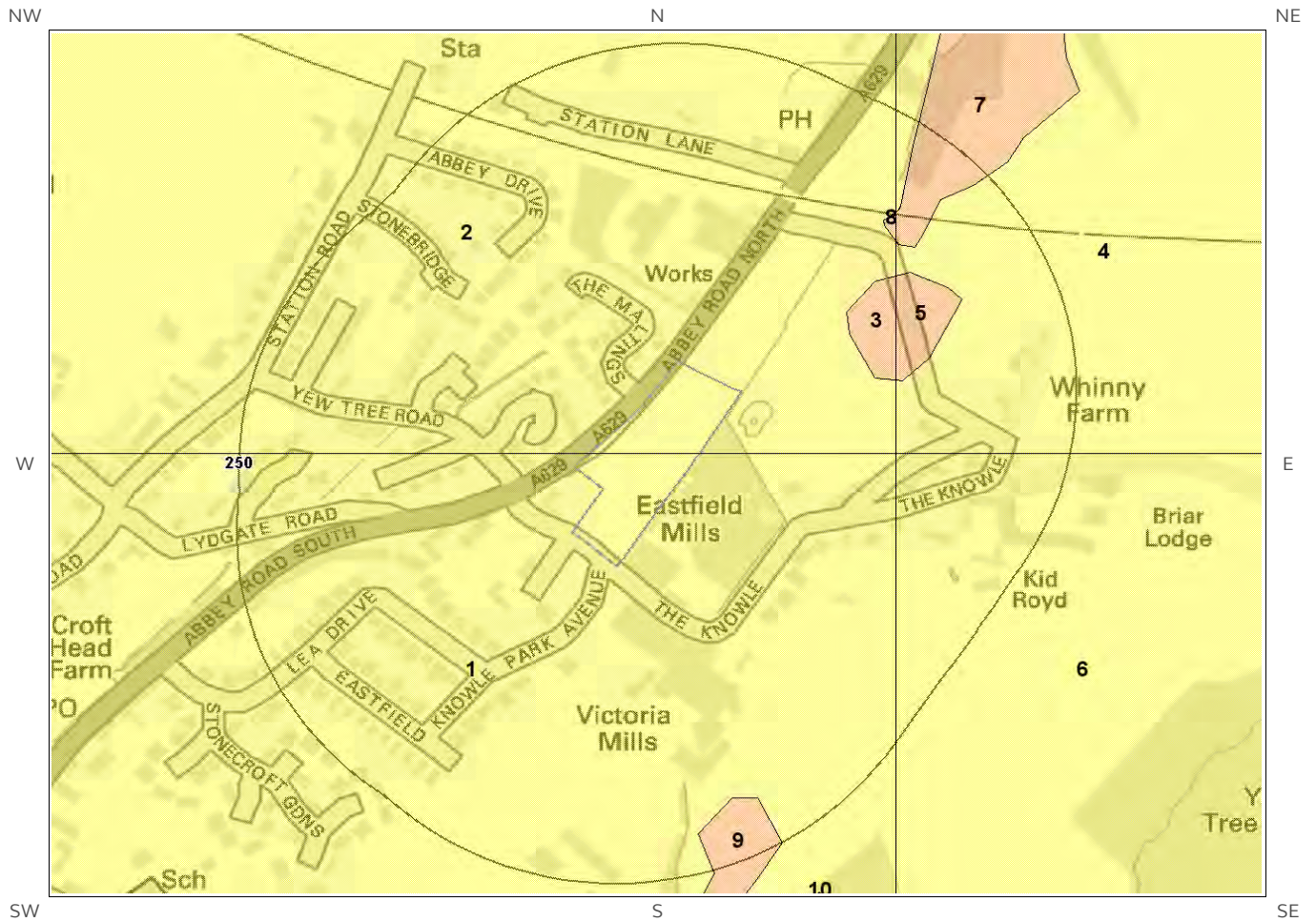
Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map



6.2 Landslides map

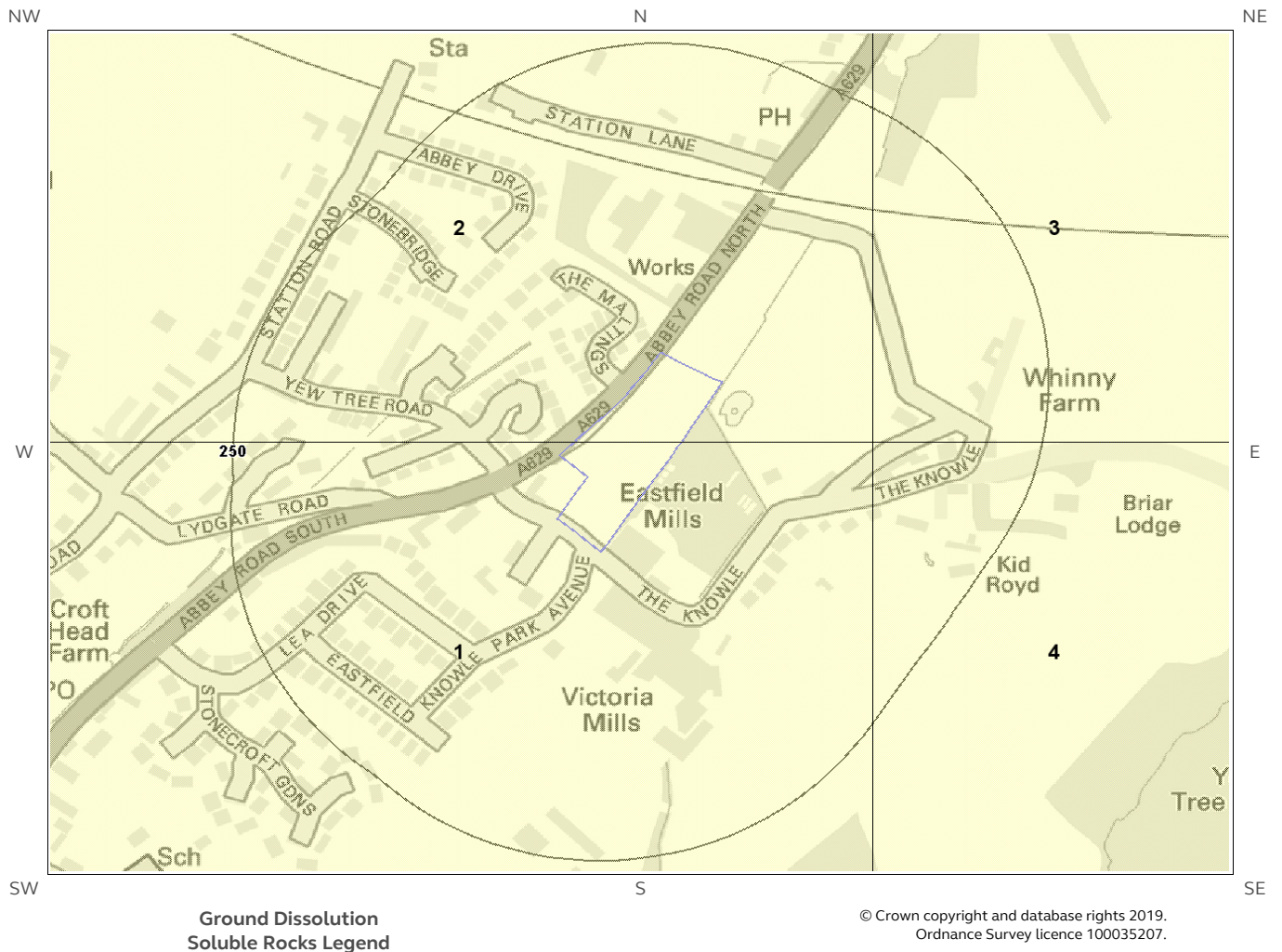


Landslides Legend

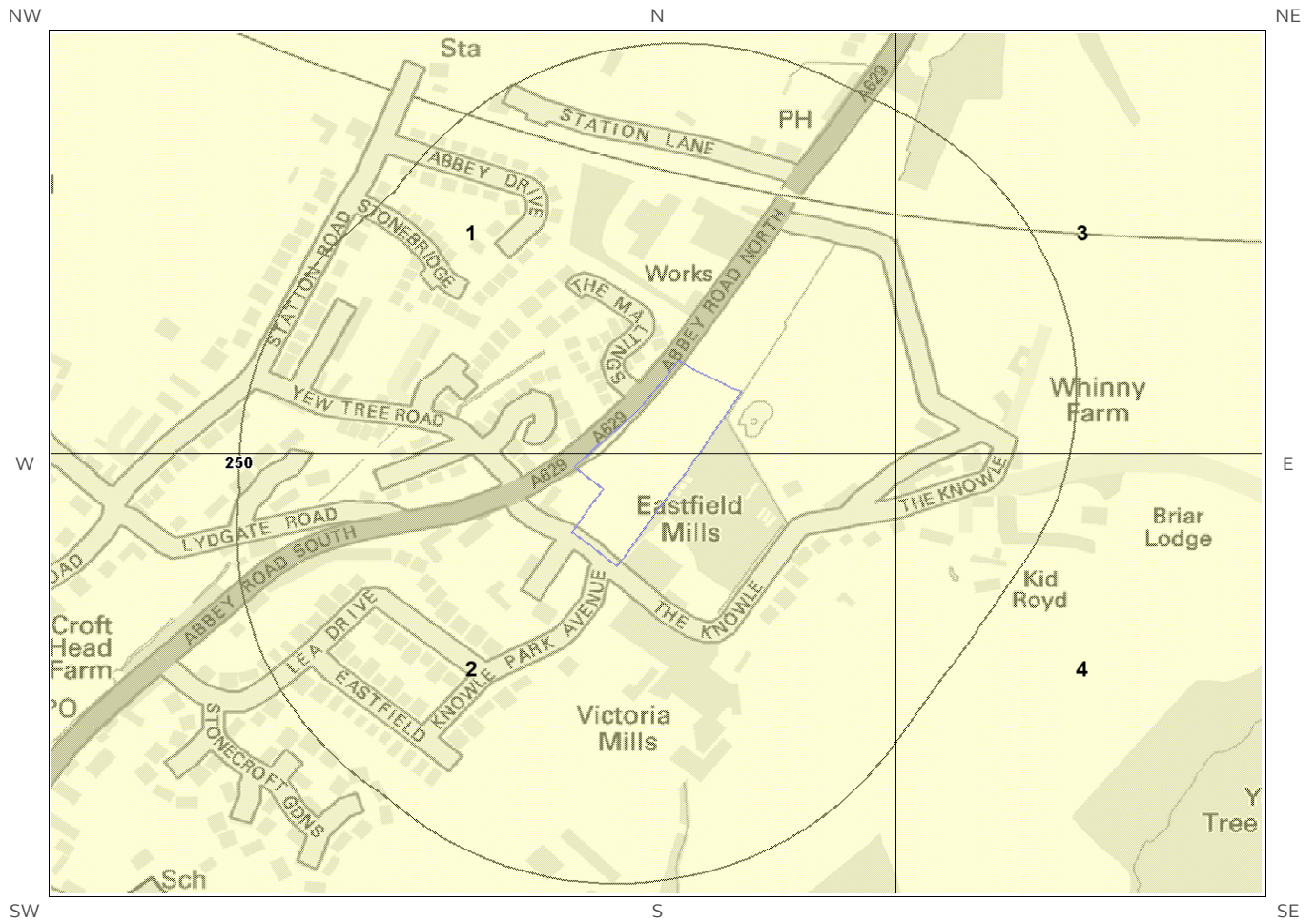
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6.3 Ground Dissolution of Soluble Rocks map



6.4 Compressible Deposits map

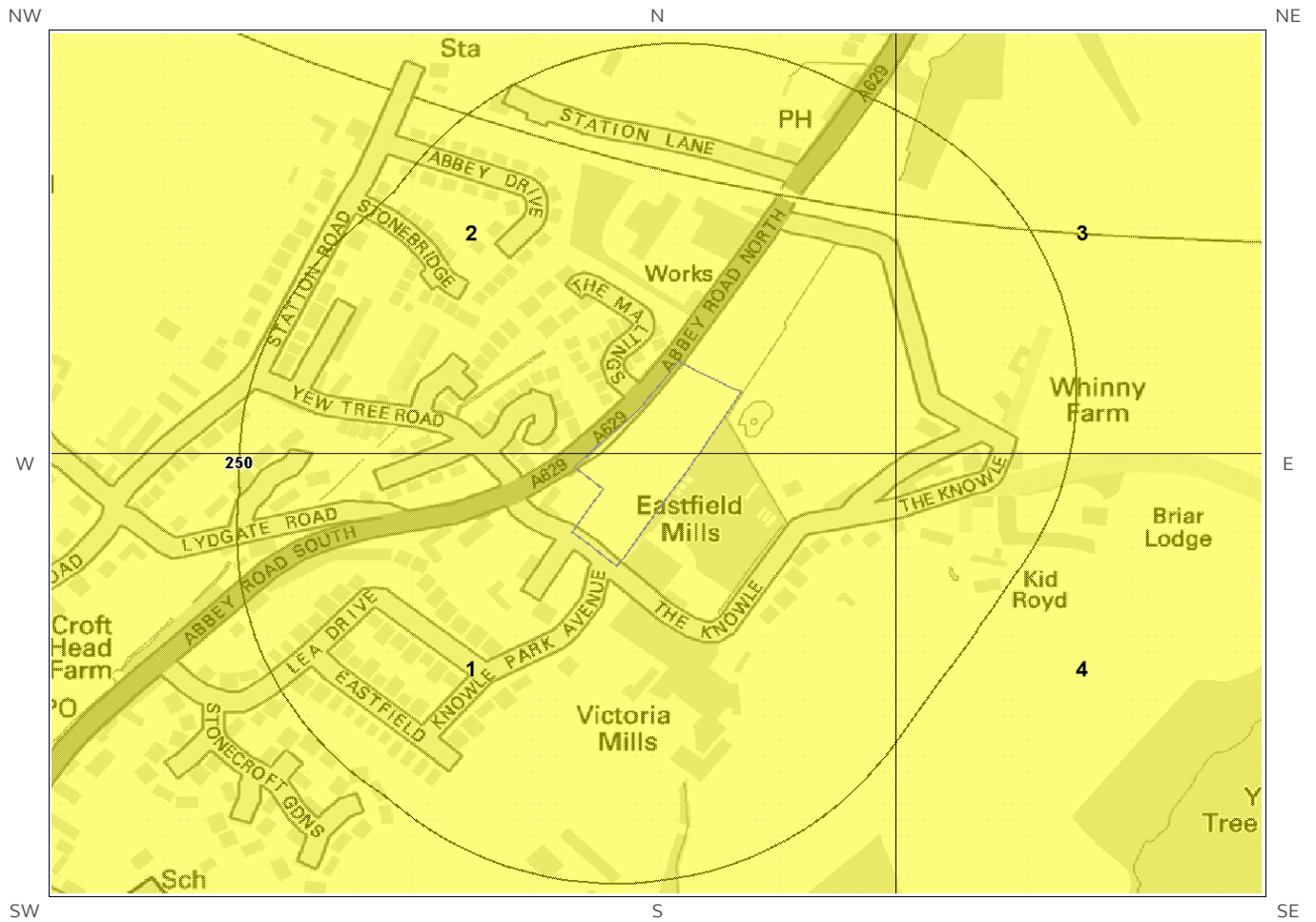


Compressible Deposits Legend

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6.5 Collapsible Deposits map

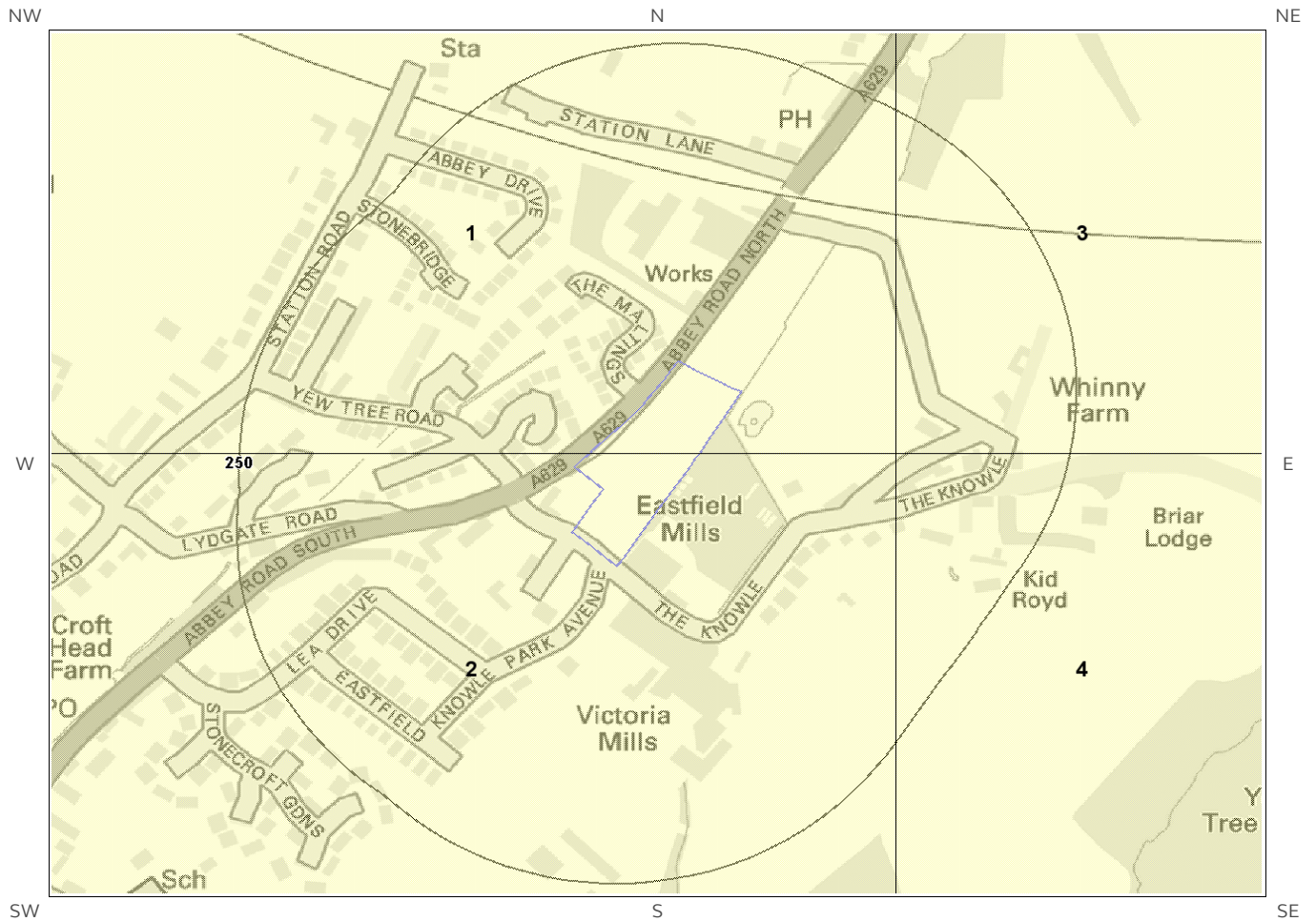


Collapsible Deposits Legend

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6.6 Running Sand map



Running Sand Legend

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6 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? **Very Low**

6.1 Shrink-Swell Clays

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
2	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
3	3.0	SE	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	28.0	SE	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.

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

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
2	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.

6.3 Ground Dissolution of Soluble Rocks

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. 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.
2	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. 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.

6.4 Compressible Deposits

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
2	0.0	On Site	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.

6.5 Collapsible Deposits

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

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

6.6 Running Sands

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

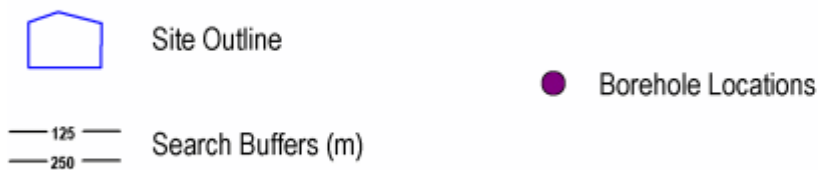
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	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.

7 Borehole Records map



Borehole Records Legend

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7 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:

7

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	23.0	NW	419760 410020	SE11SE41	2	YEW TREE RD SHEPLEY TP 3
2	32.0	W	419730 410000	SE11SE42	1	YEW TREE RD SHEPLEY TP 4
3	73.0	NW	419740 410070	SE11SE40	2	YEW TREE RD SHEPLEY TP 2
4	76.0	NW	419690 410020	SE11SE39	2	YEW TREE RD SHEPLEY TP 1
5	84.0	S	419770 409830	SE10NE21	83	SHEPLEY HUDDERSFIELD
6	85.0	S	419820 409831	SE10NE1	93	VICTORIA MILLS SHEPLEY
7	149.0	S	419840 409770	SE10NE20	73	SHEPLEY HUDDERSFIELD

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

- #1: scans.bgs.ac.uk/sobi_scans/boreholes/41498
- #2: scans.bgs.ac.uk/sobi_scans/boreholes/41499
- #3: scans.bgs.ac.uk/sobi_scans/boreholes/41497
- #4: scans.bgs.ac.uk/sobi_scans/boreholes/41496
- #5: scans.bgs.ac.uk/sobi_scans/boreholes/40625
- #6: scans.bgs.ac.uk/sobi_scans/boreholes/40605
- #7: scans.bgs.ac.uk/sobi_scans/boreholes/40624

8 Estimated Background Soil Chemistry

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

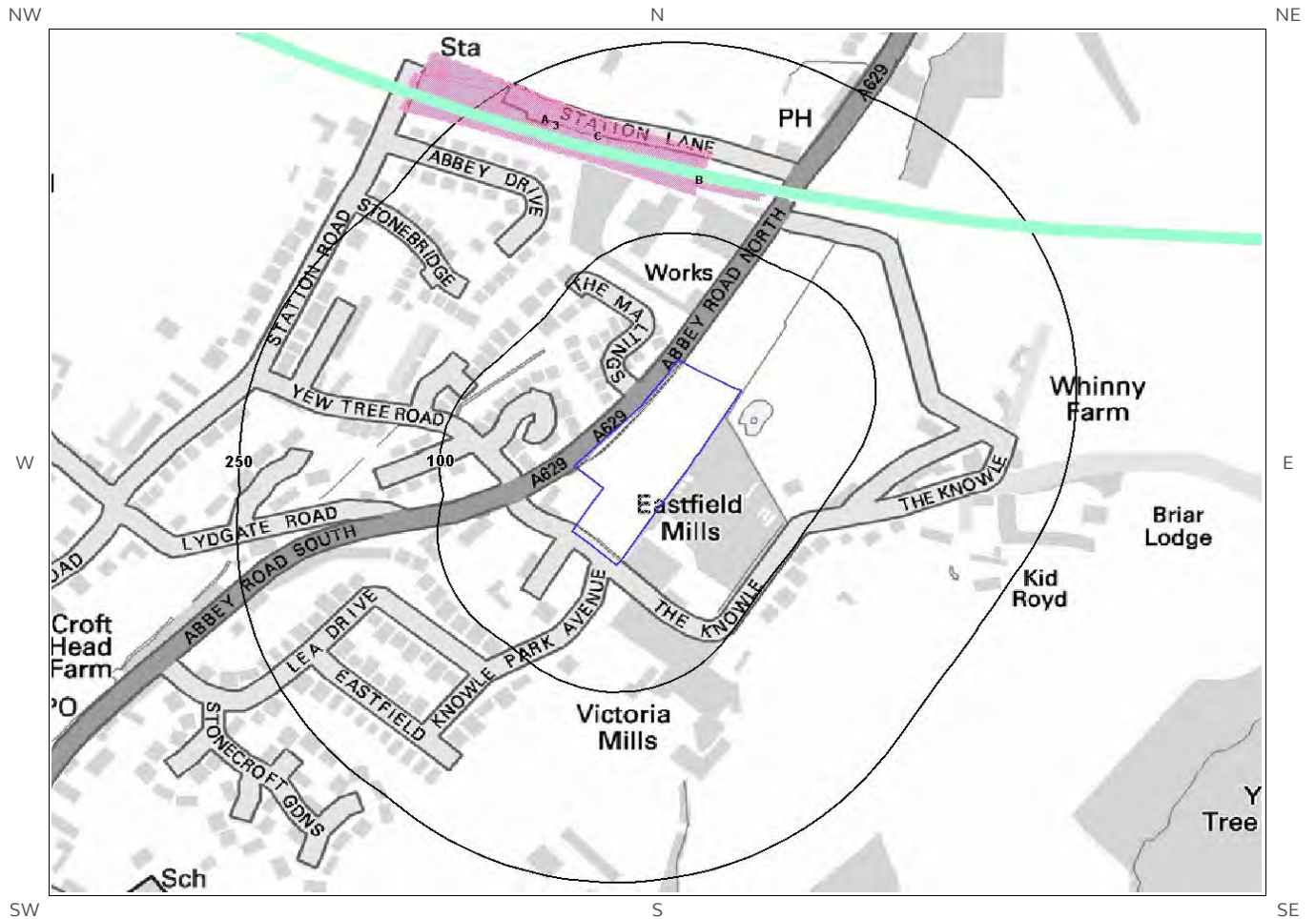
6

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

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
29.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
36.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
36.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

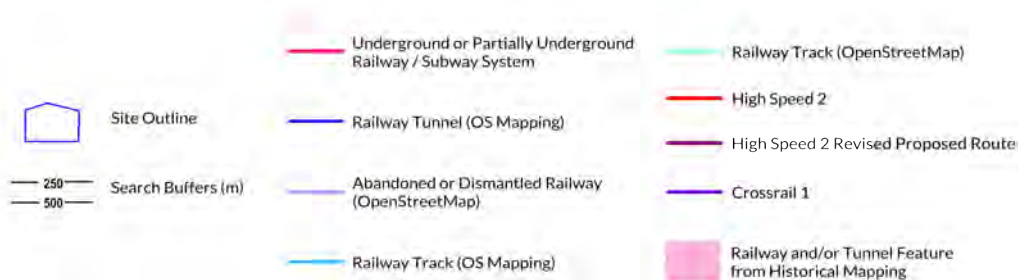
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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© OpenStreetMapContributors



9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1A	130	N	419746 410258	Railway Sidings	1968
2A	130	N	419746 410258	Railway Sidings	1955
3	132	N	419748 410254	Railway Sidings	1932
6B	135	N	419854 410212	Railway Sidings	1913
7B	140	N	419858 410216	Railway Sidings	1959
4A	143	N	419744 410254	Railway Sidings	1948

ID	Distance (m)	Direction	NGR	Details	Date
5A	143	N	419744 410254	Railway Sidings	1904
8C	153	N	419778 410247	Railway Sidings	1913
9C	157	N	419781 410252	Railway Sidings	1959

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
143	N	Penistone Line	rail
143	N	Not given	Multi Track
143	N	Not given	Multi Track
143	N	Penistone Line	rail
148	N	Penistone Line	rail
148	N	Penistone Line	rail
151	NE	Penistone Line	rail
151	NE	Penistone Line	rail
155	NE	Penistone Line	rail
155	NE	Penistone Line	rail
156	NE	Penistone Line	rail
156	NE	Penistone Line	rail
160	NE	Penistone Line	rail
160	NE	Penistone Line	rail

Multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

*Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a **Groundsure HS2 and Crossrail 1 Report**.*

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

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Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk



BGS Geological Hazards Reports and general geological enquiries

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British Gypsum Ltd
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LE12 6HX



The Coal Authority

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Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk



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Email: enquiries@phe.gov.uk
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Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:
<https://www.groundsure.com/terms-and-conditions-feb11-2019>

APPENDIX E

Groundsure Report

Historical Maps



Haigh Huddleston & Associates
99-101, LEEDS ROAD,
DEWSBURY, WF12 7BU

Groundsure Reference:	GS-6047536
Your Reference:	YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Date	22 May 2019
Report Delivery Method:	Email - pdf

Enviro Insight

Address: 419815, 410001,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Address: 419815, 410001,
Date: 22 May 2019
Reference: GS-6047536
Client: Haigh Huddleston & Associates

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 29-Jun-2018
Grid Reference: 419815,410001
Site Size: 0.8858ha

Report Reference: GS-6047536
Client Reference: YORKSHIRE_COUNTRY_PROPERTIES_7465

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Overview of Findings

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

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	1	18	38	43
1.2 Additional Information – Historical Tank Database	1	11	1	1
1.3 Additional Information – Historical Energy Features Database	0	2	6	12
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	5
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	1	16	27
Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	1
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	1	0	0	0
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	1	1
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	1	0	0	3
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	0	2

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	5	5	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	None identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	None identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m					
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	None identified					
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	6	0	2	5
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	4
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	6	0	2	0
6.6 Source Protection Zones (within 500m of the study site)	2	0	0	1	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	3	1	Not searched	Not searched

Section 6: Hydrogeology and Hydrology	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	Yes
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	24	50	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	Yes	Yes	Not searched	Not searched	Not searched

Section 7: Flooding						
7.1 Environment Agency Zone 2 floodplains within 250m of the study site	None identified					
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified					
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low					
7.4 Flood Defences within 250m of the study site	None identified					
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified					
7.6 Areas used for Flood Storage within 250m of the study site	None identified					
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Limited potential					
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	Low					

Section 8: Designated Environmentally Sensitive Sites						
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	1	3	13
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	3
8.14 Records of Green Belt land	2	0	2	0	1	0

Section 9: Natural Hazards	
9.1 Maximum risk of natural ground subsidence	Very Low
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Very Low
9.1.2 Maximum Landslides hazard rating identified on the study site	Very Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	Negligible
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Negligible
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 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.

Section 10: Mining	
10.1 Coal mining areas within 75m of the study site	Identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

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. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. 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.

3. 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.

4. 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 gas pipelines and underground electricity transmission lines.

5. Geology

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

6. Hydrogeology and Hydrology

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

7. Flooding

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

8. Designated Environmentally Sensitive Sites

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

9. 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 and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. 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.

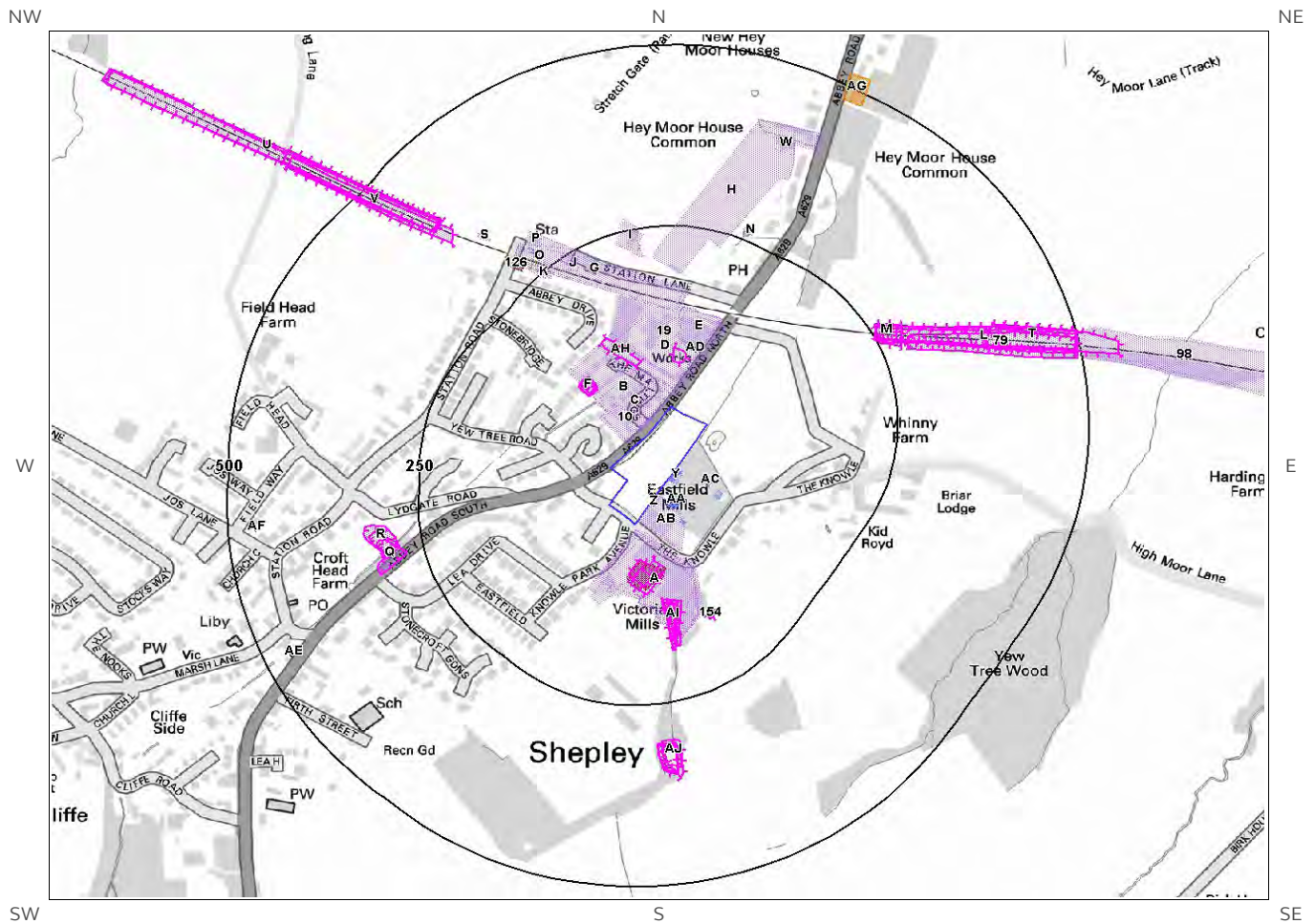
Note: Maps

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).

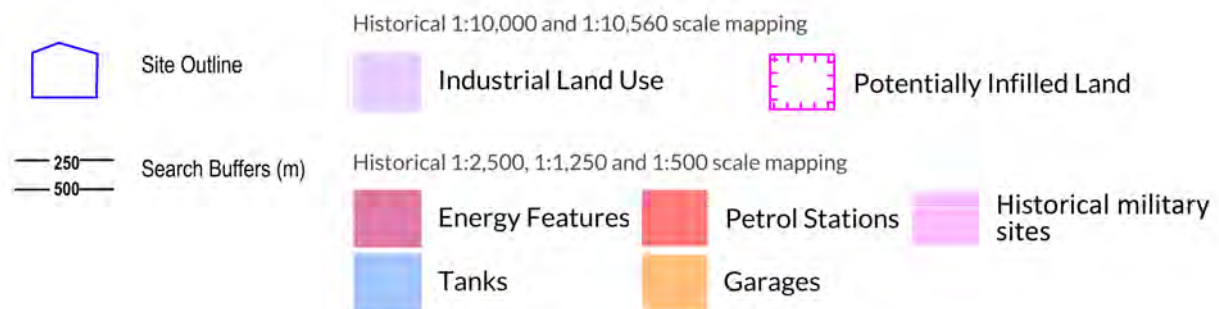
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

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. Historical Land Use



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1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 100

ID	Distance [m]	Direction	Use	Date
1AB	0	On Site	Unspecified Mills	1980
2Y	1	SE	Unspecified Tanks	1980
3C	8	NW	Sawmill	1951
4A	8	S	Unspecified Mills	1970
5A	8	S	Unspecified Mills	1980
6A	10	SE	Unspecified Mills	1955
7B	10	NW	Unspecified Commercial/Industrial	1968
8B	10	NW	Unspecified Commercial/Industrial	1977
9B	10	NW	Unspecified Commercial/Industrial	1990
10	12	NW	Sawmill	1948
11A	13	S	Unspecified Mills	1904
12A	13	S	Unspecified Mills	1948
13B	14	NW	Sawmill	1932
14C	14	NW	Sawmill	1904
15A	14	S	Unspecified Mills	1932
16D	17	NE	Gas Works	1892
17A	22	S	Unspecified Mill	1892
18D	26	N	Gas Works	1904
19	35	N	Unspecified Works	1990
20D	62	N	Unspecified Pit	1968
21AH	72	NW	Refuse Heap	1904
22E	86	NE	Unspecified Works	1977
23E	86	NE	Malthouse	1968
24E	86	NE	Malthouse	1951
25E	87	NE	Malthouse	1948
26E	87	NE	Malthouse	1904
27E	87	NE	Malthouse	1932
28F	90	NW	Unspecified Heap	1948
29F	90	NW	Unspecified Heap	1951
30F	94	NW	Unspecified Heap	1932
31F	94	NW	Unspecified Heap	1932
32G	130	N	Railway Sidings	1968

33G	130	N	Railway Sidings	1951
34G	132	N	Railway Sidings	1932
35G	143	N	Railway Sidings	1904
36G	143	N	Railway Sidings	1948
37H	184	N	Unspecified Works	1977
38H	184	N	Unspecified Works	1968
39H	184	N	Unspecified Disused Mill	1951
40I	210	N	Sawmill	1904
41I	220	N	Sawmill	1892
42J	223	NW	Railway Building	1892
43J	232	NW	Railway Building	1977
44J	232	NW	Railway Building	1968
45J	232	NW	Railway Building	1990
46J	232	NW	Goods Shed	1951
47J	233	NW	Goods Shed	1932
48J	236	NW	Railway Building	1904
49J	236	NW	Goods Shed	1948
50K	236	NW	Railway Station	1892
51K	240	NW	Railway Station	1951
52K	241	NW	Railway Station	1932
53K	244	NW	Railway Station	1904
54K	244	NW	Railway Station	1948
55K	247	NW	Railway Station	1968
56L	248	NE	Cuttings	1948
57M	250	NE	Cuttings	1951
58L	251	NE	Cuttings	1904
59L	251	NE	Cuttings	1932
60N	257	NE	Unspecified Tanks	1951
61M	257	NE	Cuttings	1892
62N	257	N	Unspecified Tanks	1932
63N	257	N	Unspecified Tanks	1948
64N	257	N	Unspecified Tanks	1904
65O	260	NW	Railway Building	1892
66O	269	NW	Railway Building	1968
67O	269	NW	Railway Building	1951
68O	270	NW	Railway Building	1932
69P	274	NW	Railway Station	1977
70P	274	NW	Railway Station	1990
71Q	274	W	Refuse Heap	1892
72O	274	NW	Railway Building	1948
73O	274	NW	Railway Building	1904
74L	278	NE	Cuttings	1951
75Q	280	W	Refuse Heap	1948
76Q	280	W	Refuse Heap	1904
77R	282	W	Unspecified Heap	1970
78R	282	W	Unspecified Heap	1980

79	282	E	Cuttings	1892
80S	329	NW	Railway Building	1932
81S	332	NW	Railway Building	1948
82S	332	NW	Railway Building	1904
83V	365	NW	Cuttings	1892
84T	379	E	Cuttings	1993
85T	379	E	Cuttings	1979
86W	381	N	Unspecified Works	1990
87U	391	NW	Cuttings	1904
88U	391	NW	Cuttings	1948
89V	391	NW	Cuttings	1968
90V	391	NW	Cuttings	1977
91V	391	NW	Cuttings	1990
92V	391	NW	Cuttings	1951
93U	392	NW	Cuttings	1932
94W	396	N	Unspecified Mill	1892
95W	399	N	Unspecified Disused Mill	1948
96W	399	N	Unspecified Mill	1904
97W	399	N	Unspecified Disused Mill	1932
98	497	E	Railway Sidings	1932
99X	499	E	Railway Sidings	1979
100X	499	E	Railway Sidings	1967

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

14

ID	Distance (m)	Direction	Use	Date
101Y	0	On Site	Tanks	1984
102Y	1	SE	Tanks	1968
103Z	2	SE	Unspecified Tank	1984
104Y	2	SE	Tanks	1992
105Y	2	SE	Tanks	1992
106Z	3	SE	Unspecified Tank	1913
107Z	20	SE	Tanks	1968
108AA	20	SE	Tanks	1913
109AA	20	SE	Tanks	1968
110AC	46	SE	Tanks	1913
111AB	46	SE	Unspecified Tank	1913
112AB	46	SE	Unspecified Tank	
113AC	61	SE	Tanks	

114N	253	N	Tanks
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1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

20

ID	Distance (m)	Direction	Use	Date
115A	50	S	Electricity Substation	1992
116A	50	S	Electricity Substation	1984
117A	51	S	Electricity Substation	1968
118A	77	SE	Electricity Substation	1994
119AD	82	NE	Electricity Substation	1996
120AD	82	NE	Electricity Substation	1975
121AD	84	NE	Electricity Substation	1987
122AD	85	N	Electricity Substation	1975
123O	271	NW	Electricity Substation	1996
124O	271	NW	Electricity Substation	1994
125O	271	NW	Electricity Substation	1987
126	274	NW	Electricity Substation	1992
127AE	460	SW	Electricity Substation	1968
128AE	460	SW	Electricity Substation	1968
129AF	461	W	Electricity Substation	1984
130AE	463	SW	Electricity Substation	1992
131AE	463	SW	Electricity Substation	1984
132AF	467	W	Electricity Substation	
133AF	467	W	Electricity Substation	
134AF	469	W	Electricity Substation	

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary:

0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 5

ID	Distance (m)	Direction	Use	Date
135AG	481	NE	Garage	1992
136AG	481	NE	Garage	1985
137AG	481	NE	Garage	1959
138AG	481	NE	Garage	1976
139AG	482	NE	Garage	1987

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary: 0

Database searched and no data found.

1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 44

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
140A	49	S	Pond	1970
141A	62	S	Pond	1892
142AD	62	N	Unspecified Pit	1968
143AH	72	NW	Refuse Heap	1904
144F	90	NW	Unspecified Heap	1948
145F	90	NW	Unspecified Heap	1951
146F	94	NW	Unspecified Heap	1932
147F	94	NW	Unspecified Heap	1932
148AI	110	S	Pond	1970
149AI	111	S	Pond	1955
150AI	112	S	Reservoir	1948
151AI	112	S	Reservoir	1904
152AI	113	S	Reservoir	1932
153AI	121	S	Pond	1892
154	155	SE	Reservoir	1955
155L	248	NE	Cuttings	1948

156M	250	NE	Cuttings	1951
157L	251	NE	Cuttings	1904
158L	251	NE	Cuttings	1932
159M	257	NE	Cuttings	1892
160Q	274	W	Refuse Heap	1892
161L	278	NE	Cuttings	1951
162Q	280	W	Refuse Heap	1904
163Q	280	W	Refuse Heap	1948
164R	282	W	Unspecified Heap	1980
165R	282	W	Unspecified Heap	1970
166L	282	E	Cuttings	1892
167AJ	301	S	Pond	1970
168AJ	301	S	Reservoir	1955
169AJ	301	S	Pond	1980
170AJ	304	S	Reservoir	1904
171AJ	304	S	Reservoir	1948
172AJ	306	S	Reservoir	1932
173AJ	312	S	Pond	1892
174V	365	NW	Cuttings	1892
175T	379	E	Cuttings	1979
176T	379	E	Cuttings	1993
177U	391	NW	Cuttings	1904
178U	391	NW	Cuttings	1948
179V	391	NW	Cuttings	1951
180V	391	NW	Cuttings	1968
181V	391	NW	Cuttings	1990
182V	391	NW	Cuttings	1977
183U	392	NW	Cuttings	1932

2. Environmental Permits, Incidents and Registers Map



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

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

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

0

Database searched and no data found.

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

0

Database searched and no data found.

2.1.3 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.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

1

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

ID	Distance (m)	Direction	NGR	Details
4	495	NE	420080 410504	Address: Shepley Coachworks Ltd, Abbey Rd, Shepley, Huddersfield, HD8 8EP Process: Respraying of Road Vehicles Status: Historical Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

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

1

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
3	0	On Site	419810 409950	Address: TRANS CONT, TRANS CONT, TRANS CONT, TRANS CONT, TRANS-CONT Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: 3624 Permit Version: 1 Receiving Water: TRIB. STREAM OF SHEPLEY DIKE Status: REVOKED - UNSPECIFIED Issue date: 27/05/1982 Effective Date: 27-May-1982 Revocation Date: 12/03/1991

2.1.9 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.

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

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

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

0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

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

2

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

ID	Distance (m)	Direction	NGR	Details
1	183	N	419897.0 410246.0	Incident Date: 09-Feb-2002 Incident Identification: 57405.0 Pollutant: Oils and Fuel Pollutant Description: Gas and Fuel Oils Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	459	SW	419347.0 409734.0	Incident Date: 14-Oct-2015 Incident Identification: 1380682.0 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified Water Impact: Category 2 (Significant) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

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

0

Database searched and no data found.

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

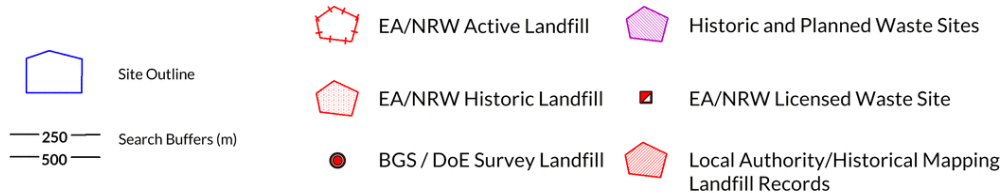
Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

4

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

ID	Distance (m)	Direction	NGR	Details
1	144	E		Site Address: The Knowle, Shepley Waste Licence: - Site Reference: - Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	1156	S		Site Address: Lane Head Quarry, Lane Head, Shepley, Near Huddersfield Waste Licence: Yes Site Reference: 4700/0246, 446 Waste Type: Inert, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 14-Aug-1980 Licence Surrendered: Licence Holder Address: Haigh Lane, Hoylandswaine, Sheffield Operator: - Licence Holder: H C W Makings and Son First Recorded: - Last Recorded: -
Not shown	1270	NW		Site Address: Cote Close, Dam Hill, Shirley Waste Licence: - Site Reference: - Waste Type: Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	1399	N		Site Address: Hawthorne Way, Shelley Waste Licence: - Site Reference: - Waste Type: Inert, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: David Wilson Homes Licence Holder: - First Recorded: 01-Jan-1996 Last Recorded: 31-Dec-1999

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

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

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

0

Database searched and no data found.

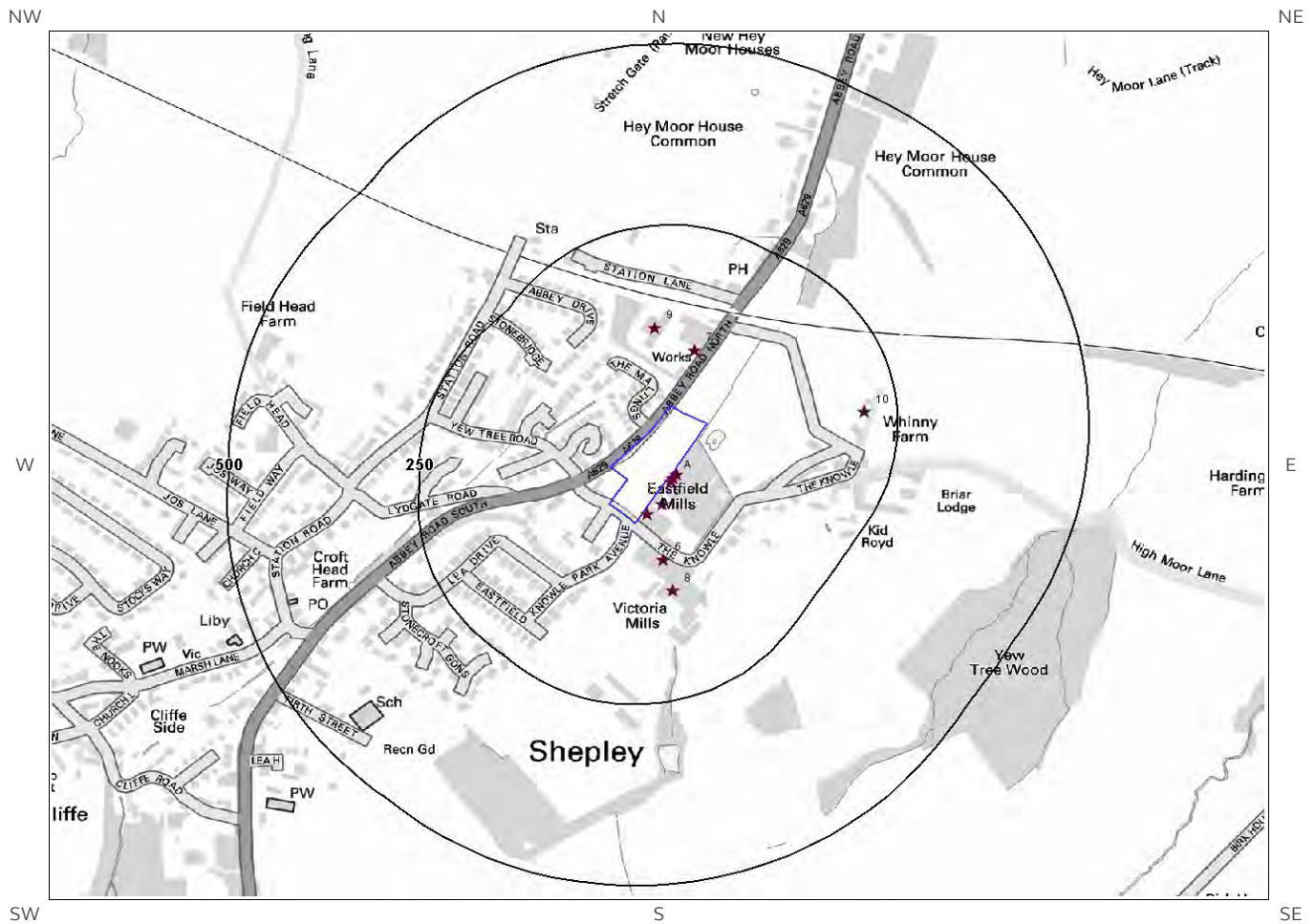
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

2

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

ID	Distance (m)	Direction	NGR	Details
Not shown	1063	NE	420858 410478	Site Address: Unit 7 Barncliffe Mills, Long Moor Lane, Shelley, Huddersfield, West Yorkshire, HD8 8LU Type: Vehicle Depollution Facility <5000 tps Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: HUD015 EPR reference: EA/EPR/BB3005FW/V002 Operator: Huddersfield Volvo Breakers Ltd Waste Management licence No: 401028 Annual Tonnage: 4999.0 Issue Date: 03/02/2014 Effective Date: - Modified: 26/05/2015 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Huddersfield Volvo Breakers Ltd Correspondence Address: -
Not shown	1177	S	419690 408738	Site Address: Carr Hill Quarry, Carr Hill Road, Upper Cumberworth, Huddersfield, West Yorkshire, HD8 8XN Type: Inert & excavation Waste TS + treatment Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: PMW002 EPR reference: EA/EPR/DB3031AT/A001 Operator: P M W Quarries Ltd Waste Management licence No: 103536 Annual Tonnage: 74999.0 Issue Date: 04/01/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Carr Hill Quarry Correspondence Address: -

4. Current Land Use Map



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4. Current Land Uses

4.1 Current Industrial Data

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

10

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

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1A	4	SE	Tank	419841 409974	West Yorkshire, HD8	Tanks (Generic)	Industrial Features
2A	4	SE	Tank	419845 409979	West Yorkshire, HD8	Tanks (Generic)	Industrial Features
3A	5	SE	Tank	419838 409969	West Yorkshire, HD8	Tanks (Generic)	Industrial Features
4	5	SE	Shepley Spring	419807 409923	Eastfield Mills, The Knowle, Shepley, Huddersfield, West Yorkshire, HD8 8EA	Non Alcoholic Drinks	Foodstuffs
5	13	SE	Tank	419827 409938	West Yorkshire, HD8	Tanks (Generic)	Industrial Features
6	61	SE	Xtex Polythene Ltd	419827 409861	The Knowle, Shepley, Huddersfield, West Yorkshire, HD8 8EA	Rubber, Silicones and Plastics	Industrial Products
7	84	N	Electricity Sub Station	419869 410150	West Yorkshire, HD8	Electrical Features	Infrastructure and Facilities
8	104	SE	Chimney	419840 409818	West Yorkshire, HD8	Chimneys	Industrial Features
9	111	N	Works	419817 410181	West Yorkshire, HD8	Unspecified Works Or Factories	Industrial Features
10	207	E	Crested & Country Ltd	420091 410064	The Old Barn, The Knowle, Shepley, Huddersfield, West Yorkshire, HD8 8EA	Clothing, Components and Accessories	Consumer Products

4.2 Petrol and Fuel Sites

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

0

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site:

0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

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

5.2 Superficial Ground and Drift Geology

Database searched and no data found.

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

5.3 Bedrock and Solid Geology

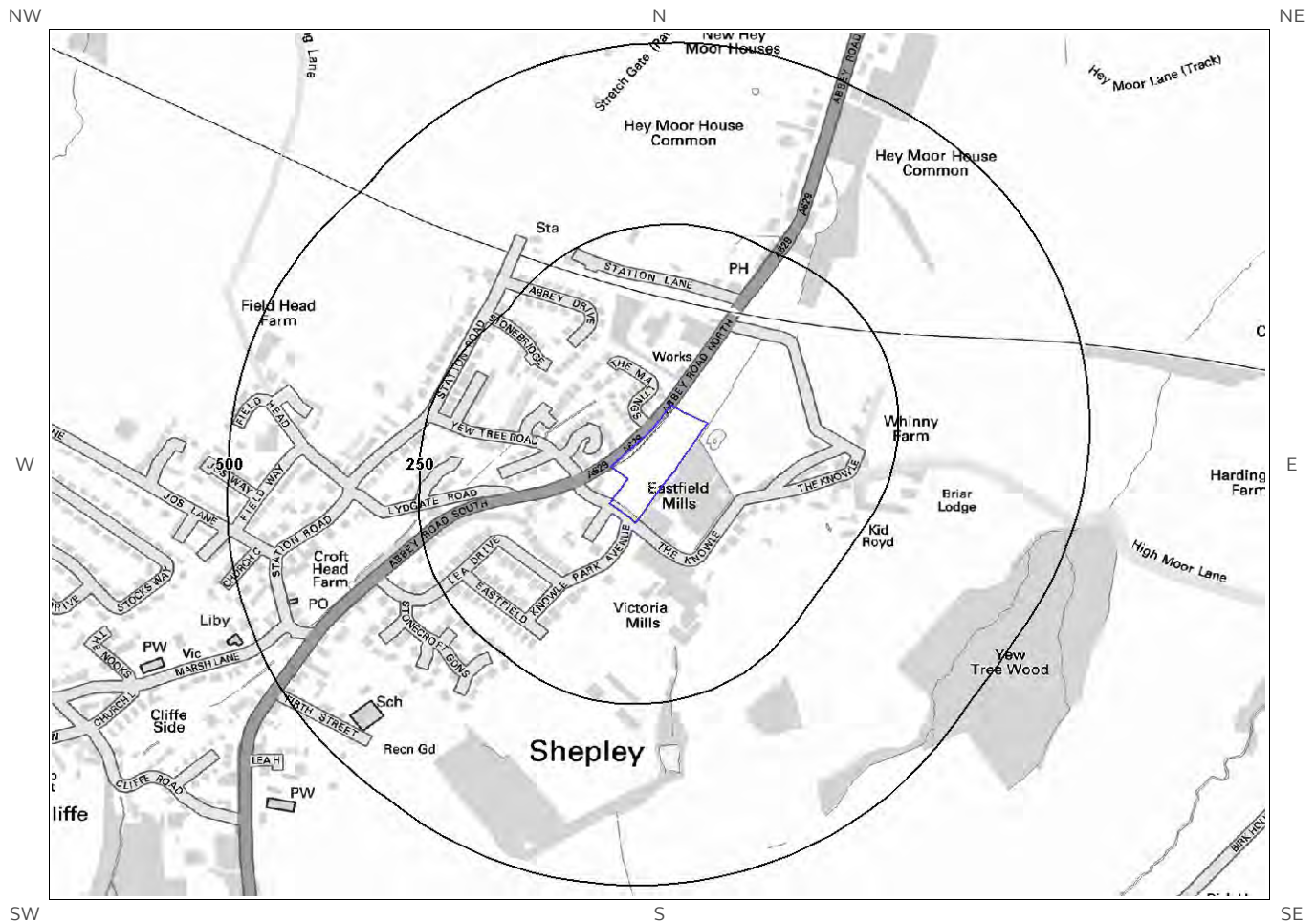
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
GR-SDST	GRENOSIDE SANDSTONE	SANDSTONE
PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE

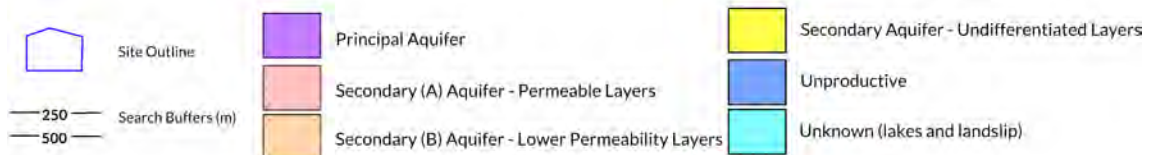
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

6a. Aquifer Within Superficial Geology



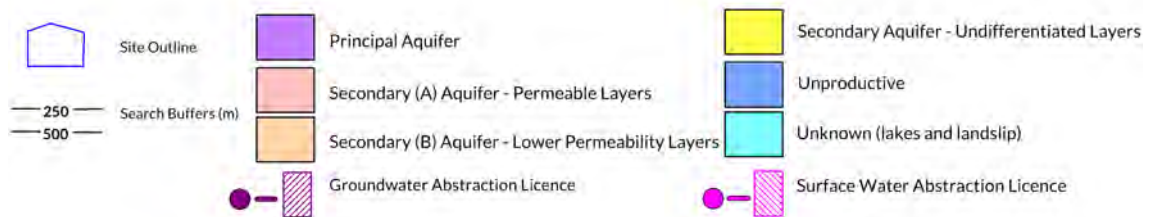
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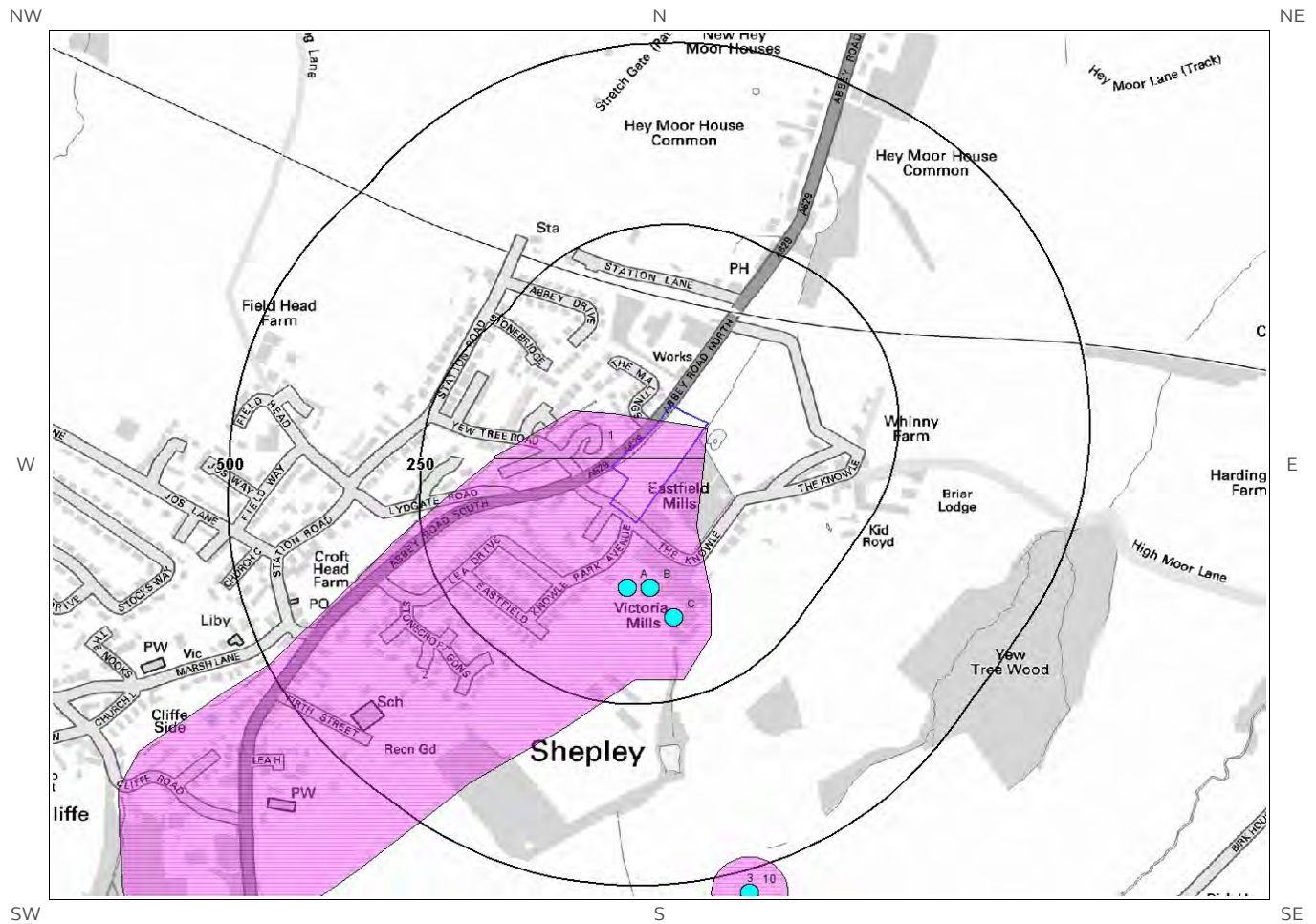
6b. Aquifer Within Bedrock Geology and Abstraction Licences



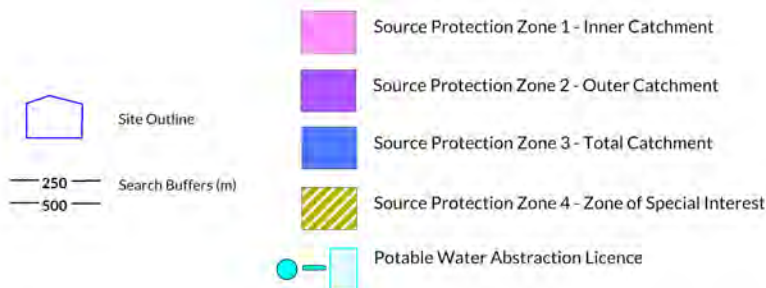
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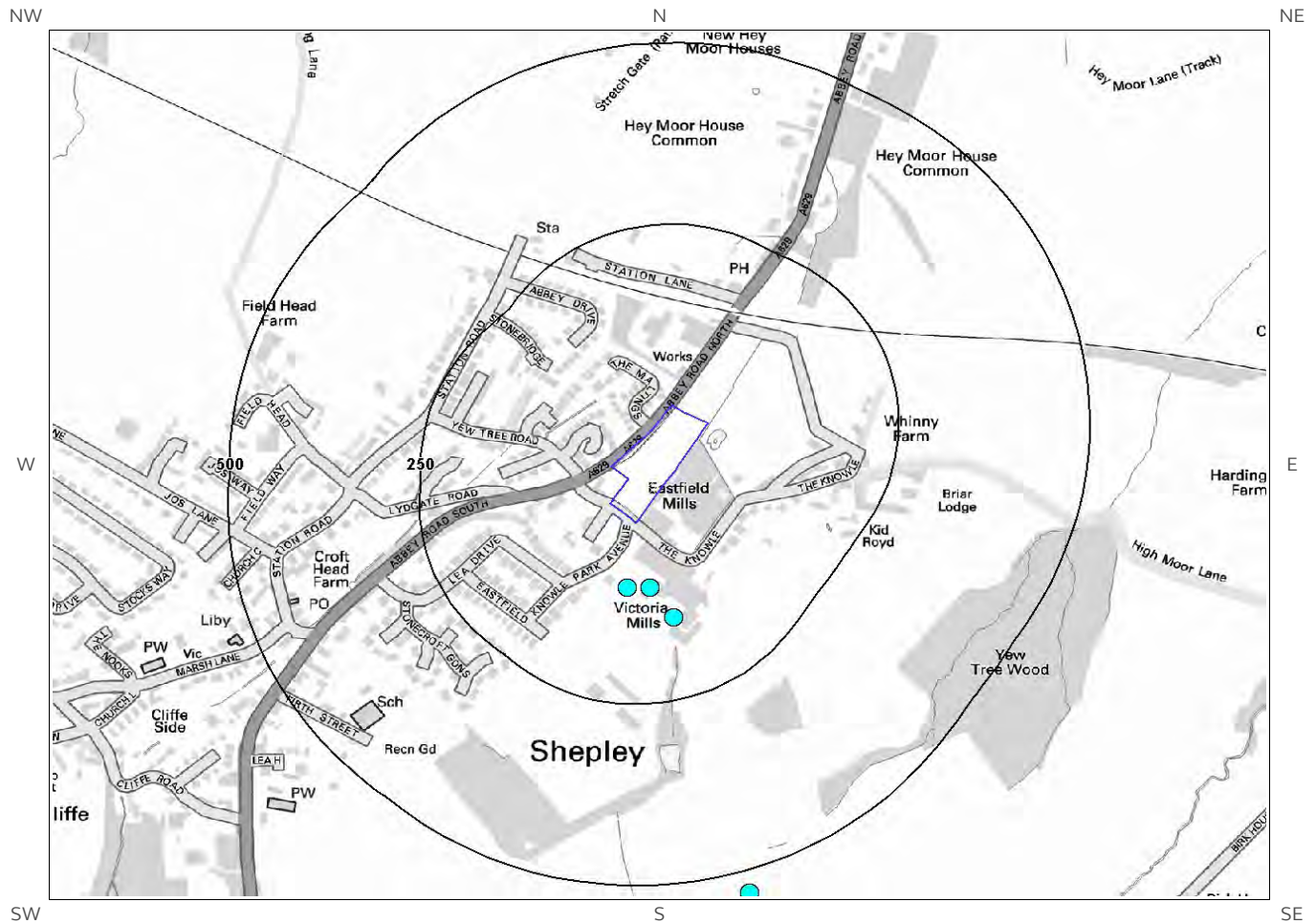
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences



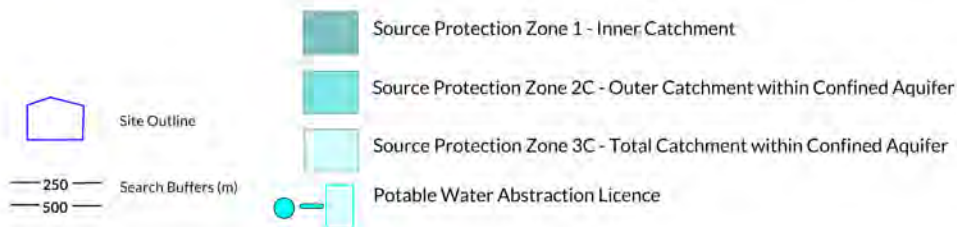
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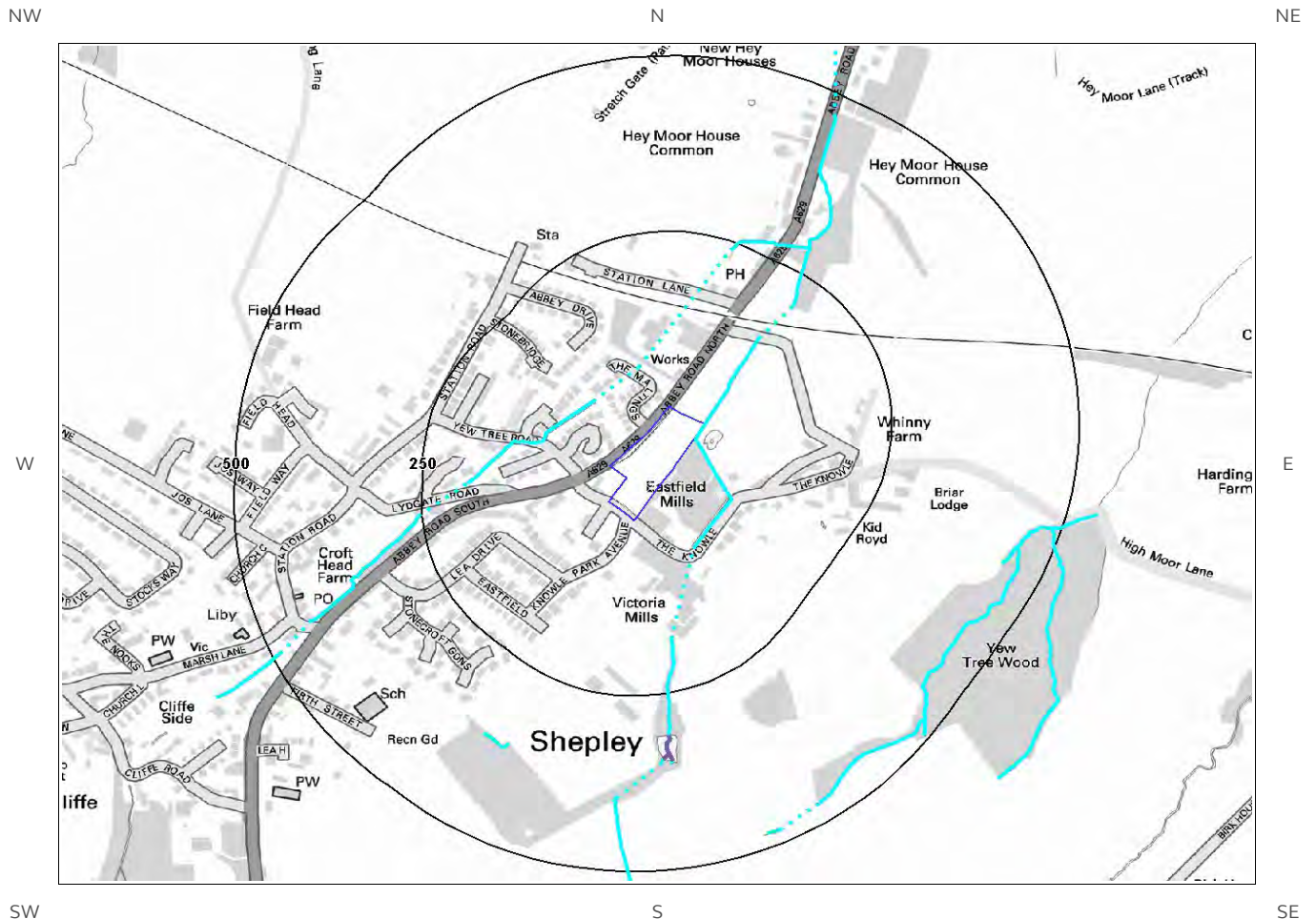
6d. Hydrogeology – Source Protection Zones within confined aquifer



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6e. Hydrology – Watercourse Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property No

Database searched and no data found.

From 1 April 2010, the Environment Agency/Natural Resources Wales'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 Enviro Insight User Guide.

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales'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 Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	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	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
3	115	E	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
4	124	SE	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

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site

Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
5A	91	S	419780 409820	Status: Historical Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - EASTFIELD MILL SHEPLEY Data Type: Point Name: PENMOOR UK LIMITED Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 101 Version Start Date: 01/07/2000 Version End Date:
6A	91	S	419780 409820	Status: Active Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - SHEPLEY Data Type: Point Name: PENMOOR UK LTD Annual Volume (m³): 77000 Max Daily Volume (m³): 211 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 103 Version Start Date: 21/02/2011 Version End Date:
7B	92	S	419810 409820	Status: Historical Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - EASTFIELD MILLS SHEPLEY Data Type: Point Name: PENMOOR UK LIMITED Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 101 Version Start Date: 01/07/2000 Version End Date:
8B	92	S	419810 409820	Status: Active Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - SHEPLEY Data Type: Point Name: PENMOOR UK LTD Annual Volume (m³): 77000 Max Daily Volume (m³): 211 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 103 Version Start Date: 21/02/2011 Version End Date:
9C	139	S	419840 409780	Status: Historical Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - EASTFIELD MILLS SHEPLEY Data Type: Point Name: PENMOOR UK LIMITED Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 101 Version Start Date: 01/07/2000 Version End Date:
10C	139	S	419840 409780	Status: Active Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - SHEPLEY Data Type: Point Name: PENMOOR UK LTD Annual Volume (m³): 77000 Max Daily Volume (m³): 211 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 103 Version Start Date: 21/02/2011 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
11	532	S	419940 409400	Status: Historical Licence No: 2/27/11/189 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE-COAL MEASURES-SHEPLEY Data Type: Point Name: SHEPLEY SPRING LTD	Annual Volume (m³): 122640 Max Daily Volume (m³): 336 Original Application No: - Original Start Date: 23/01/2004 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: 23/01/2004 Version End Date:
Not shown	847	S	420000 409090	Status: Historical Licence No: 2/27/11/189 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE-COAL MEASURES-SHEPLEY Data Type: Point Name: SHEPLEY SPRING LTD	Annual Volume (m³): 122640 Max Daily Volume (m³): 336 Original Application No: - Original Start Date: 23/01/2004 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: 23/01/2004 Version End Date:
Not shown	1674	NE	421100 411200	Status: Historical Licence No: 2/27/11/187 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE-LOWER COAL MEASURES-PENNINE GARDEN CENTRE, HUDDS Data Type: Point Name: ARMITAGE & SONS T/A ARMITAGE GARDEN CENTRE	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 11/04/2001 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: 11/04/2001 Version End Date:
Not shown	1674	NE	421100 411200	Status: Historical Licence No: 2/27/11/187 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE-LOWER COAL MEASURES-PENNINE GARDEN CENTRE Data Type: Point Name: ARMITAGE GARDEN CENTRE	Annual Volume (m³): 10000 Max Daily Volume (m³): 50 Original Application No: - Original Start Date: 11/04/2001 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: 11/04/2001 Version End Date:
Not shown	1771	NE	420900 411500	Status: Historical Licence No: 2/27/11/178 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: DEARNLEY	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 07/11/1995 Expiry Date: - Issue No: 100 Version Start Date: 07/11/1995 Version End Date:
Not shown	1771	NE	420900 411500	Status: Active Licence No: 2/27/11/178 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - SHELLEY Data Type: Point Name: DEARNLEY	Annual Volume (m³): 9855 Max Daily Volume (m³): 27 Original Application No: - Original Start Date: 07/11/1995 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date:
Not shown	1966	E	421800 409600	Status: Historical Licence No: 2/27/11/124 Details: General use relating to Secondary Category (High Loss) Direct Source: GROUNDWATERS Point: SPRING - COAL MEASURES - DAY HOLE WORKINGS Data Type: Point Name: HEPWORTH PIPE CO LTD	Annual Volume (m³): 6819 Max Daily Volume (m³): 27.27 Original Application No: - Original Start Date: 26/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 26/05/1966 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site

Identified

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
Not shown	1714	S	419900 408200	Status: Historical Licence No: 2/27/08/052 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER DEARNE & MUNCHCLIFFE BK Data Type: Point Name: HINCHCLIFFE & SONS LTD Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 17/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 24/12/1999 Version End Date:
Not shown	1902	S	419870 408010	Status: Historical Licence No: 2/27/08/052 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER DEARNE AND MUNCHCLIFFE BECK Data Type: Point Name: HINCHCLIFFE & SONS LTD Annual Volume (m³): 68182 Max Daily Volume (m³): 500 Application No: - Original Start Date: 17/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 24/12/1999 Version End Date:
Not shown	1978	S	420120 407960	Status: Historical Licence No: 2/27/08/052 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER DEARNE AND MUNCHCLIFFE BECK Data Type: Point Name: HINCHCLIFFE & SONS LTD Annual Volume (m³): 68182 Max Daily Volume (m³): 500 Application No: - Original Start Date: 17/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 24/12/1999 Version End Date:
Not shown	1979	S	420127 407960	Status: Historical Licence No: 2/27/08/052 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER DEARNE AND MUNCHCLIFFE BECK Data Type: Point Name: HINCHCLIFFE & SONS LTD Annual Volume (m³): 68182 Max Daily Volume (m³): 500 Application No: - Original Start Date: 17/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 24/12/1999 Version End Date:

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site

Identified

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details
4A	91	S	419780 409820	Status: Historical Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - EASTFIELD MILL SHEPLEY Data Type: Point Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 101 Version Start Date:

ID	Distance (m)	Direction	NGR	Details	
				Name: PENMOOR UK LIMITED	Version End Date:
5A	91	S	419780 409820	Status: Active Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - SHEPLEY Data Type: Point Name: PENMOOR UK LTD	Annual Volume (m³): 77000 Max Daily Volume (m³): 211 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 103 Version Start Date: Version End Date:
6B	92	S	419810 409820	Status: Historical Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - EASTFIELD MILLS SHEPLEY Data Type: Point Name: PENMOOR UK LIMITED	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:
7B	92	S	419810 409820	Status: Active Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - SHEPLEY Data Type: Point Name: PENMOOR UK LTD	Annual Volume (m³): 77000 Max Daily Volume (m³): 211 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 103 Version Start Date: Version End Date:
8C	139	S	419840 409780	Status: Historical Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - EASTFIELD MILLS SHEPLEY Data Type: Point Name: PENMOOR UK LIMITED	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:
9C	139	S	419840 409780	Status: Active Licence No: 2/27/11/030 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER COAL MEASURES - SHEPLEY Data Type: Point Name: PENMOOR UK LTD	Annual Volume (m³): 77000 Max Daily Volume (m³): 211 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 103 Version Start Date: Version End Date:
10	532	S	419940 409400	Status: Historical Licence No: 2/27/11/189 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE-COAL MEASURES-SHEPLEY Data Type: Point Name: SHEPLEY SPRING LTD	Annual Volume (m³): 122640 Max Daily Volume (m³): 336 Original Application No: - Original Start Date: 23/01/2004 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: Version End Date:
Not shown	847	S	420000 409090	Status: Historical Licence No: 2/27/11/189 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLE-COAL MEASURES-SHEPLEY Data Type: Point Name: SHEPLEY SPRING LTD	Annual Volume (m³): 122640 Max Daily Volume (m³): 336 Original Application No: - Original Start Date: 23/01/2004 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: Version End Date:

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site

Identified

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distance (m)	Direction	Zone	Description
1	0	On Site	1	Inner catchment
2	0	On Site	1	Inner catchment
3	481	S	1	Inner catchment

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site

None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
153	S	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
215	E	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
215	E	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
342	NW	Minor Aquifer/High Leaching Potential	H3	Coarse textured or moderately shallow soils which readily transmit non-adsorbed pollutants and liquid discharges but have some ability to attenuate adsorbed pollutants because of their clay or organic matter content.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site Identified

6.9.1 Biological Quality:

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

The following Biological Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
Not shown	1388	SE	420723 408882	River Name: Calder Reach: Lupset Beck Durkar Beck End/Start of Stretch: Start of Stretch NGR	E	E	E	E	E
Not shown	1388	SE	420723 408882	River Name: Fenay Beck Reach: Upper Cumberworth Woodsome Rd End/Start of Stretch: Start of Stretch NGR	E	E	E	E	E

6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAH). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
Not shown	1388	SE	420723 408882	River Name: Fenay Beck/shepley Dike Reach: Upper Cumberworth Woodsome Rd End/Start of Stretch: Start of Stretch NGR	A	A	A	A	A

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	1 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
25	1 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
2	69 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
3	69 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
4	69 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
26	69 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
27	69 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
28	69 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
5	82 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2
29	82 NW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2
6	87 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
30	87 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): Not Provided
7	127 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
31	127 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
8	142 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
32	142 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
9	176 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
33	176 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
10	190 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
34	190 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
11	203 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
35	203 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
12	217 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
36	217 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
13	239 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
37	239 N	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
14	255 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
38	255 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
15	287 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
39	287 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
16	298 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	298 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
17	308 S	-	Lake, loch or reservoir.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 14.3
Not shown	308 S	-	Lake, loch or reservoir.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 14.3
18	336 S	-	Lake, loch or reservoir.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 8.0
19	336 S	-	Lake, loch or reservoir.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.2
Not shown	336	-	Lake, loch or reservoir.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	S			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 8.0
Not shown	336 S	-	Lake, loch or reservoir.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.2
20	342 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	342 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
21	347 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
22	347 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	347 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	347 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
23	353 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
47	353 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
24	359 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	359 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
25	397 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): Not Provided
Not shown	397 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
26	436 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	436 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
27	444 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	444 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
28	447 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
52	447 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
29	451 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	451 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
30	453 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	453 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
31	468 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
Not shown	468 NE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
32	472 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	472 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
33	479 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	479 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
34	480 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	480 SE	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
35	489 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
36	489 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	489 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	489 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
37	490 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	490	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	SW			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
38	491 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2
Not shown	491 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Aire and Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.2

6.11 Surface Water Features

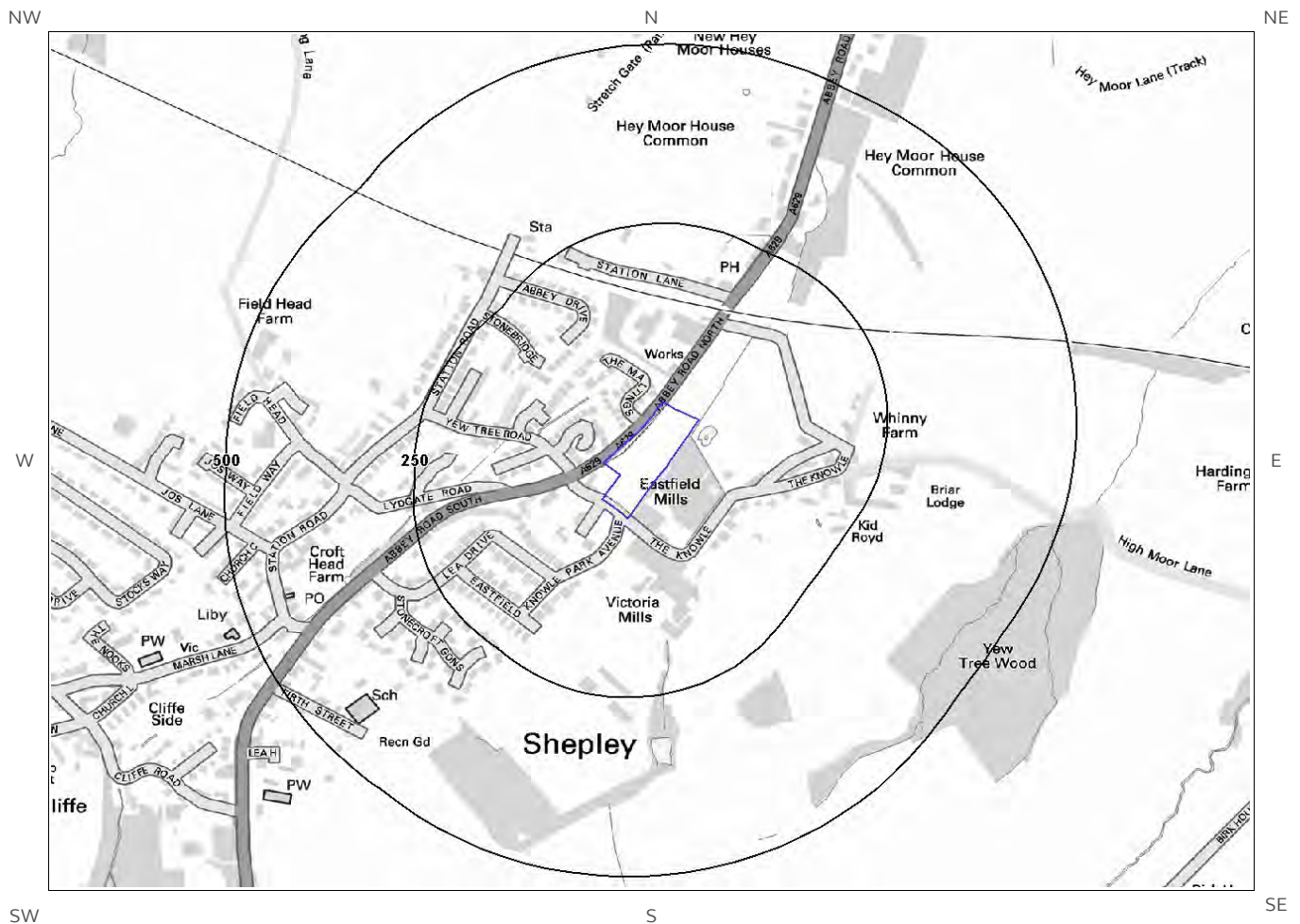
Surface water features within 250m of the study site

Identified

The following surface water records are not represented on mapping:

Distance (m)	Direction
1	SE
87	SE
104	W
157	W
176	S
203	NE
239	N

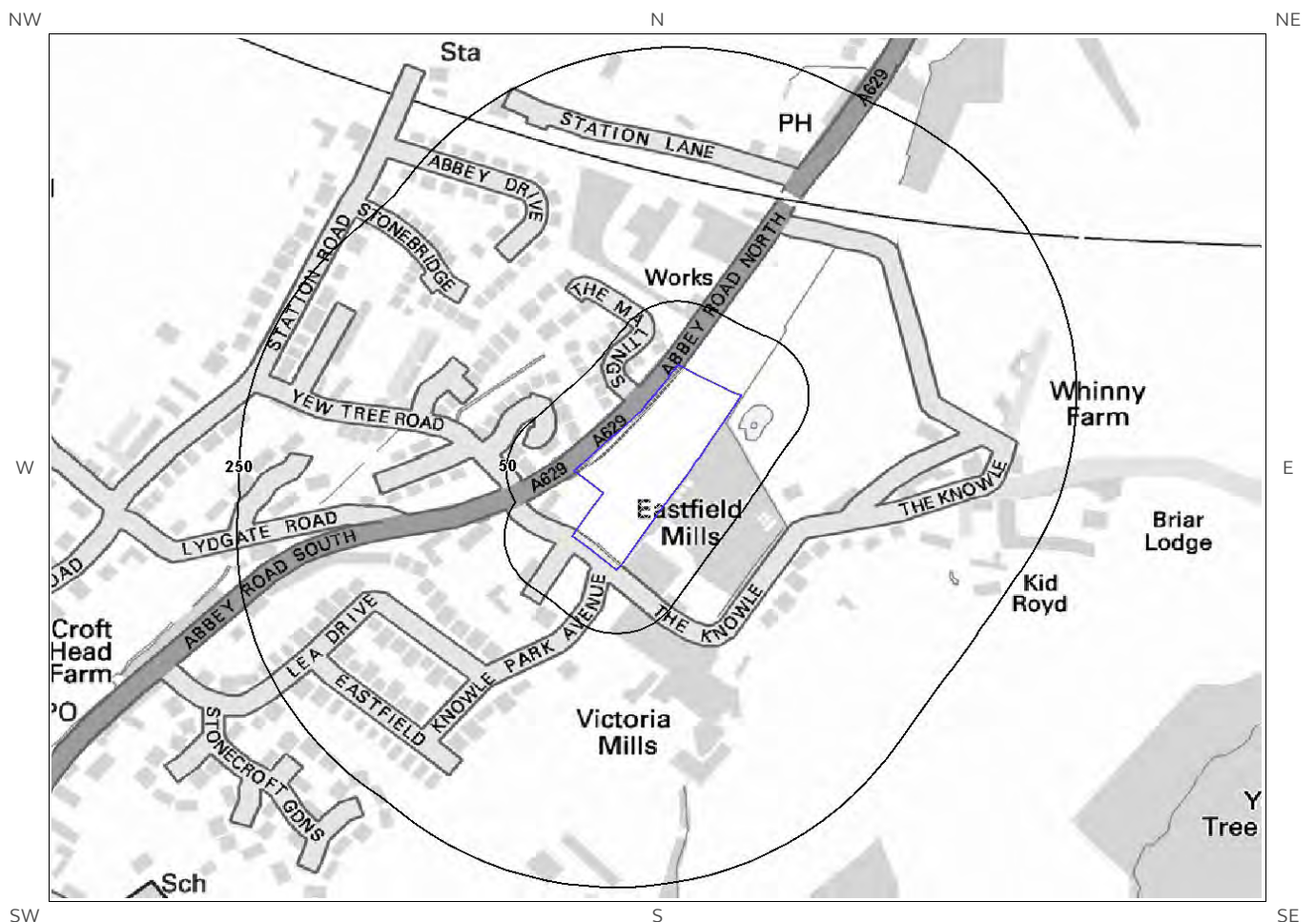
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



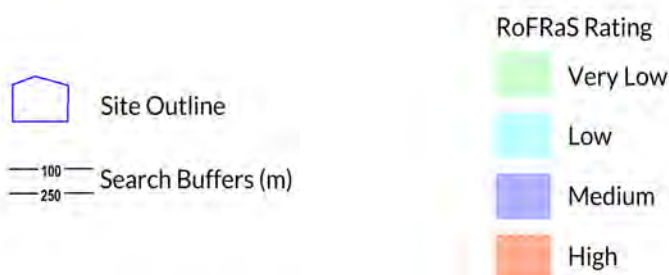
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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m None identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m None identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Flood Defences within 250m of the study site None identified
Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site None identified

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site

None identified

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site

Identified

Clearwater Flooding or Superficial Deposits Flooding

Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Limited potential

Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.

7.8 Groundwater Flooding Confidence Areas

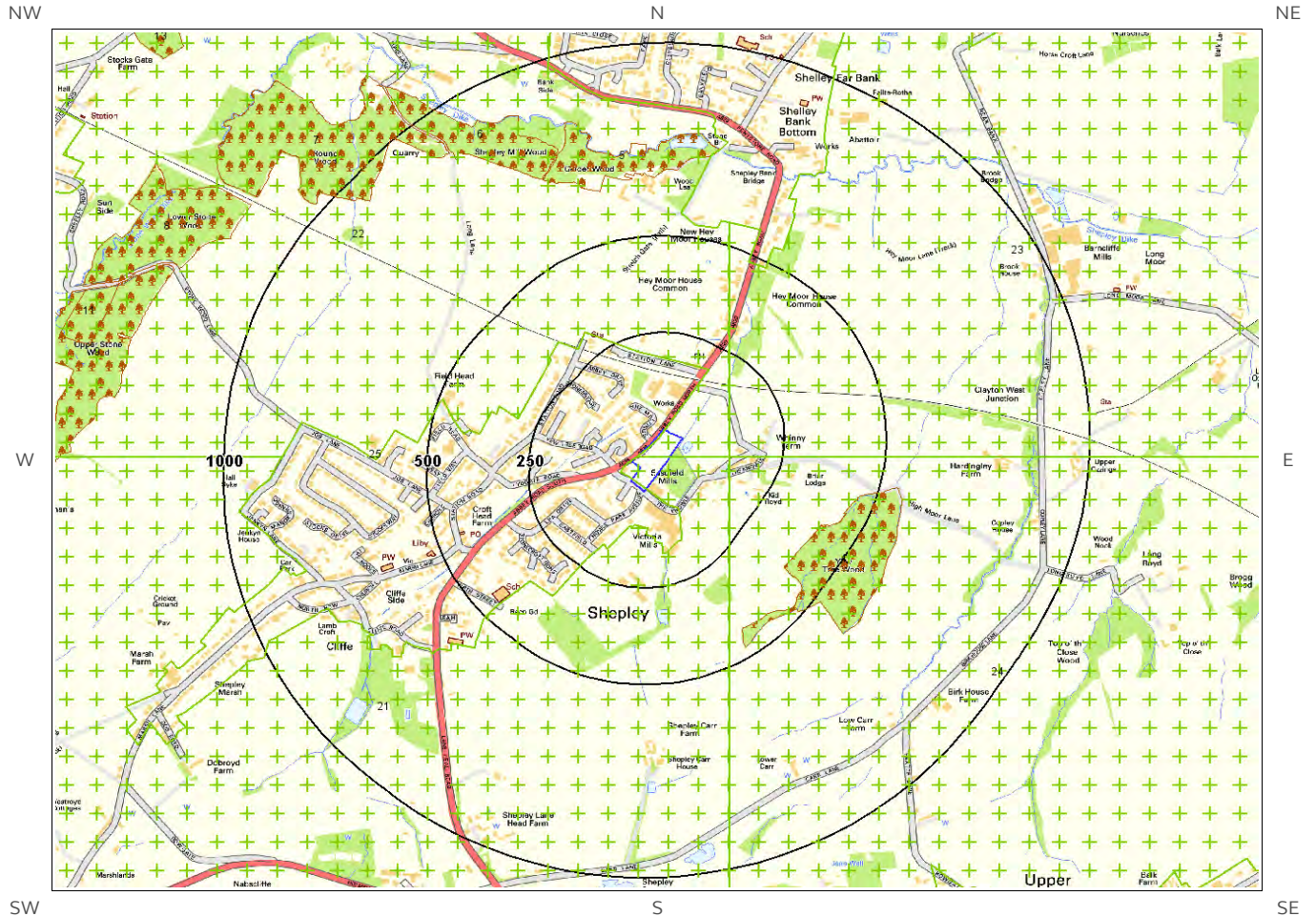
British Geological Survey confidence rating in this result

Low

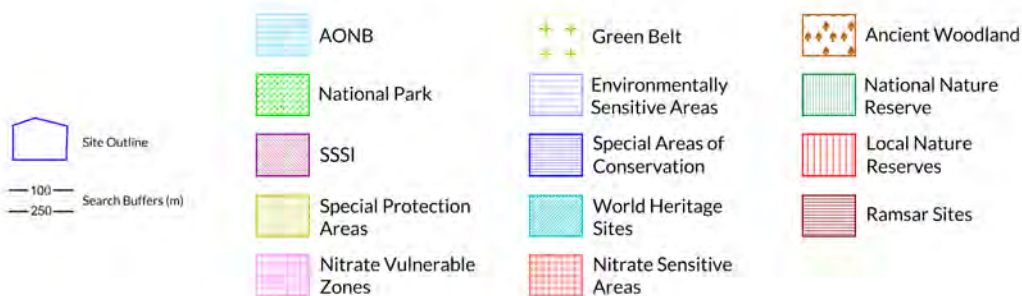
Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

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.

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site	Identified
---	------------

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

17

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
4	392	SE	YEW TREE WOOD	Ancient Replanted Woodland
5	635	N	SHEPLEY MILL WOOD	Ancient and Semi-Natural Woodland
6	711	NW	SHEPLEY MILL WOOD	Ancient and Semi-Natural Woodland
7	887	NW	SHEPLEY MILL WOOD	Ancient and Semi-Natural Woodland
8	1142	NW	SHEPLEY MILL WOOD	Ancient and Semi-Natural Woodland
9	1226	NW	SHEPLEY MILL WOOD	Ancient and Semi-Natural Woodland
Not shown	1255	NW	HARTLEY BANK WOOD	Ancient Replanted Woodland
11	1340	W	SHEPLEY MILL WOOD	Ancient Replanted Woodland
Not shown	1405	N	SHELLEY WOOD	Ancient and Semi-Natural Woodland
13	1537	NW	BIRKS WOOD	Ancient Replanted Woodland
Not shown	1645	NW	BIRKS WOOD	Ancient and Semi-Natural Woodland
Not shown	1743	N	SHELLEY WOOD	Ancient Replanted Woodland
Not shown	1753	W	WOOD END WOOD\	Ancient Replanted Woodland
Not shown	1771	N	SHELLEY WOOD	Ancient and Semi-Natural Woodland
Not shown	1771	NW	HARTLEY BANK WOOD	Ancient Replanted Woodland
Not shown	1845	SE	NEW HOUSE, GREEN AND BURN WOODS	Ancient Replanted Woodland
Not shown	1978	NW	HARTLEY BANK WOOD	Ancient Replanted Woodland

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

3

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
Not shown	1311	S	Existing	DEFRA
Not shown	1361	S	Existing	DEFRA
Not shown	1591	NE	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

5

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ID	Distance	Direction	Green Belt Name	Local Authority Name
21	0	On Site	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)
22	0	On Site	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)
23	115	E	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)
24	124	SE	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)
25	623	W	Liverpool, Manchester and West Yorks Greenbelt	Kirklees District (B)

9. Natural Hazards Findings

9.1 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 Geo Insight**, available from our **website**. The following information has been found:

9.1.1 Shrink Swell

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.

9.1.2 Landslides

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.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site Negligible

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

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. 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.

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

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site

Negligible

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

Hazard
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.

9.1.5 Collapsible Rocks

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.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site

Negligible

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

Hazard
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.

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

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site

Identified

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

Distance (m)	Direction	Details
0	On Site	The site lies in or in proximity to the coal mining reporting area as defined by the Coal Authority

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary

None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site

None identified

Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com



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Fax: 0115 936 3276.
Email:



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enquiries@bgs.ac.uk

Environment Agency
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Rotherham, S60 1BY
Tel: 03708 506 506
Web: www.environment-agency.gov.uk
Email: enquiries@environment-agency.gov.uk



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Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000



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Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk



Ordnance Survey
Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505



Local Authority
Authority: Kirklees Council
Phone: 01484 221 000
Web: <http://www.kirklees.gov.uk/>
Address: Civic Centre 3, Market Street, Huddersfield, HD1 2EY

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444



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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: County Series

Map date: 1854

Scale: 1:10,560

Printed at: 1:10,560



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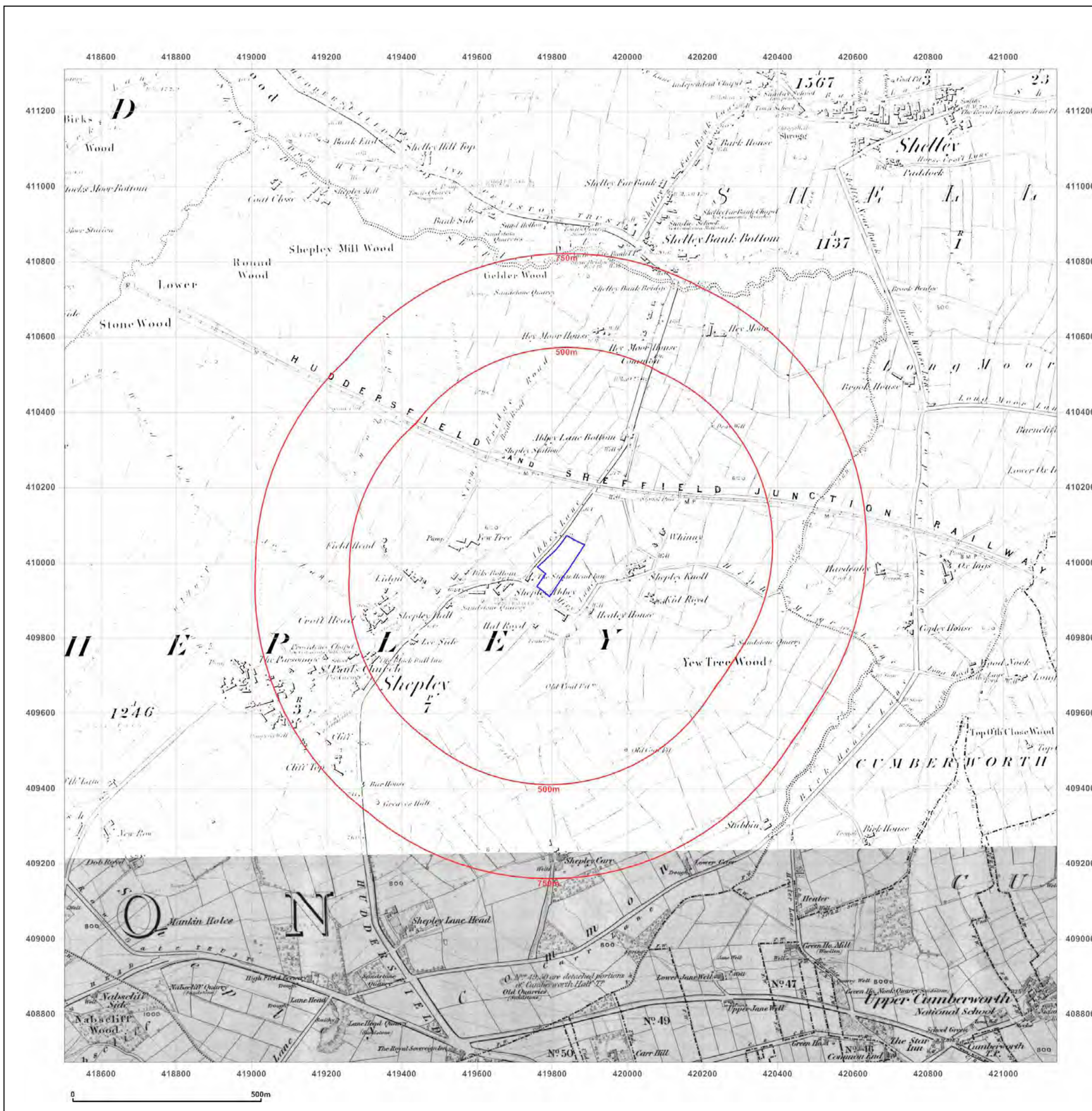


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Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: County Series

Map date: 1891-1892

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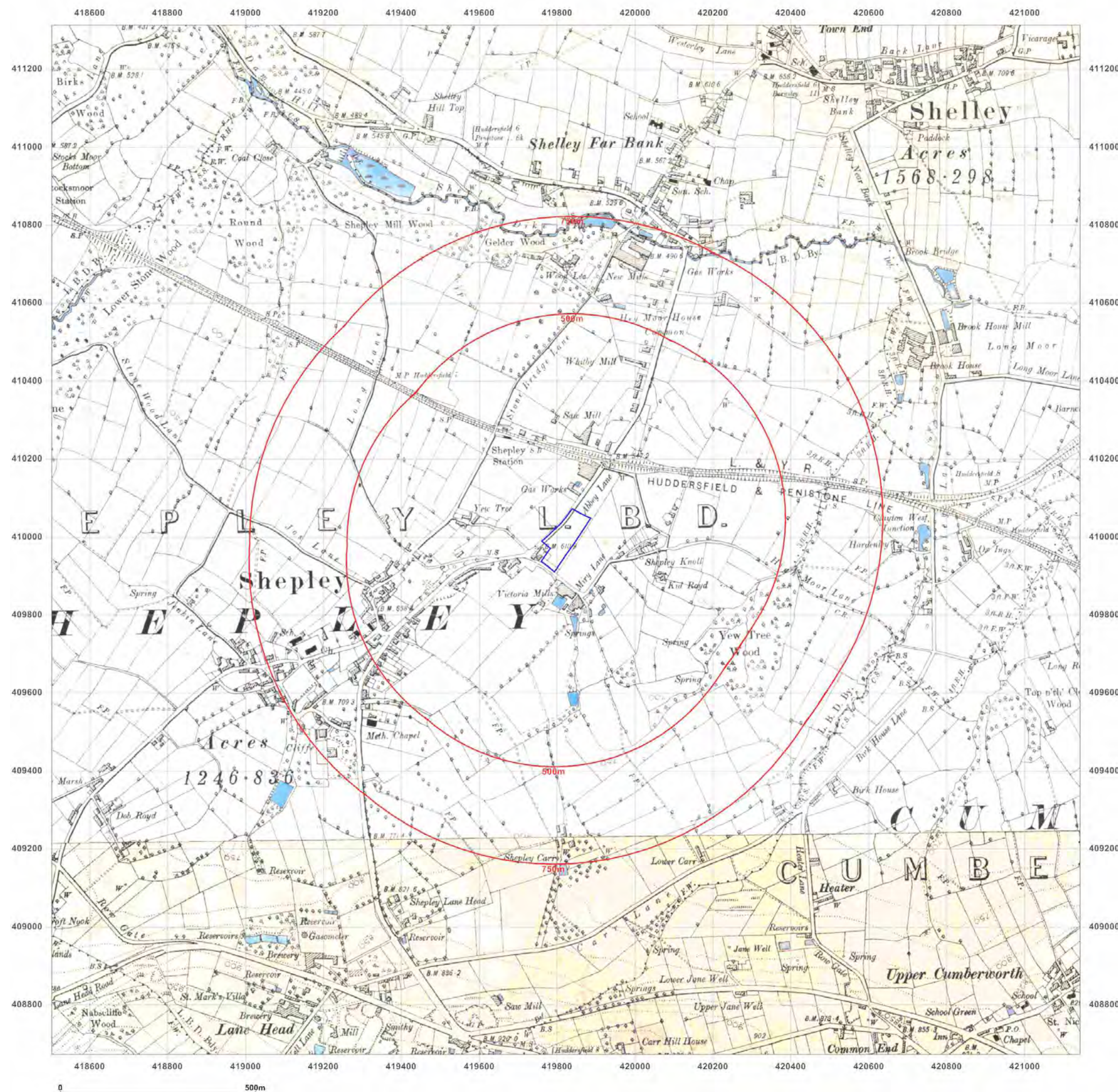


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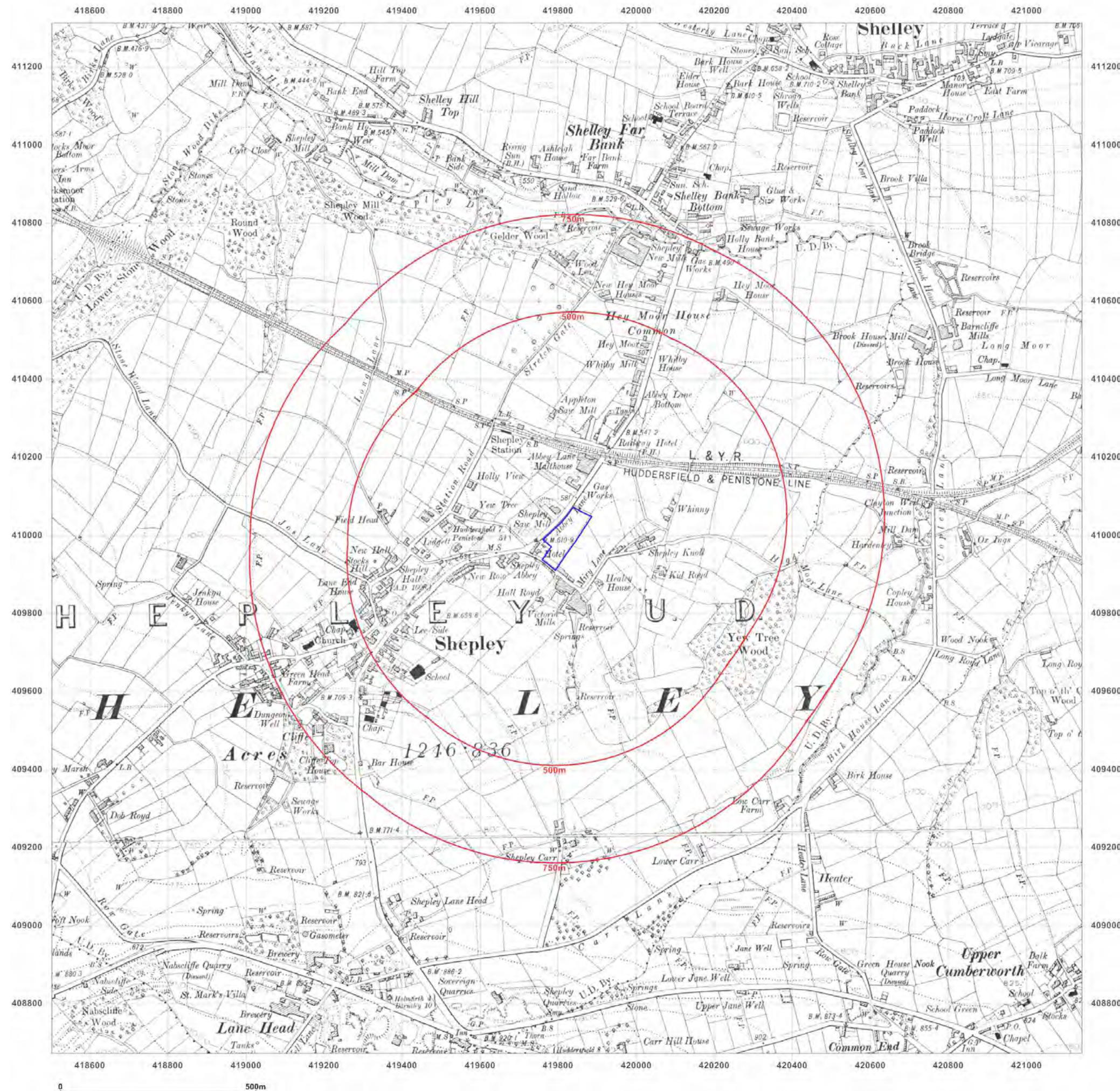


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Grid Ref: 419822, 409992

Map Name: County Series

Map date: 1932-1933

Scale: 1:10,560

Printed at: 1:10,560



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 Copyright N/A
 Levelled N/A

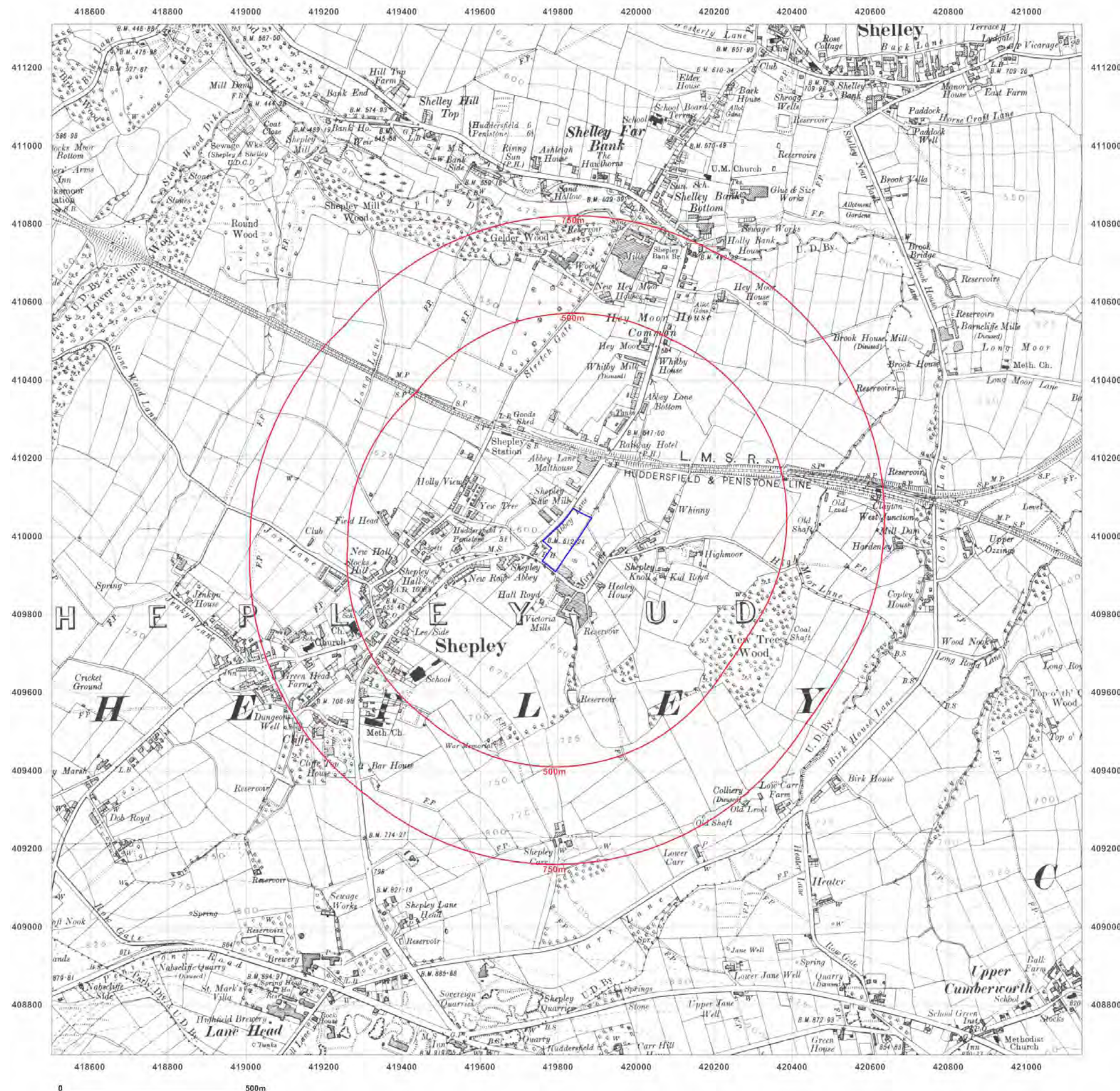


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Production date: 22 May 2019

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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: County Series

Map date: 1948

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1851
 Revised 1948
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1851
 Revised 1948
 Edition N/A
 Copyright N/A
 Levelled N/A

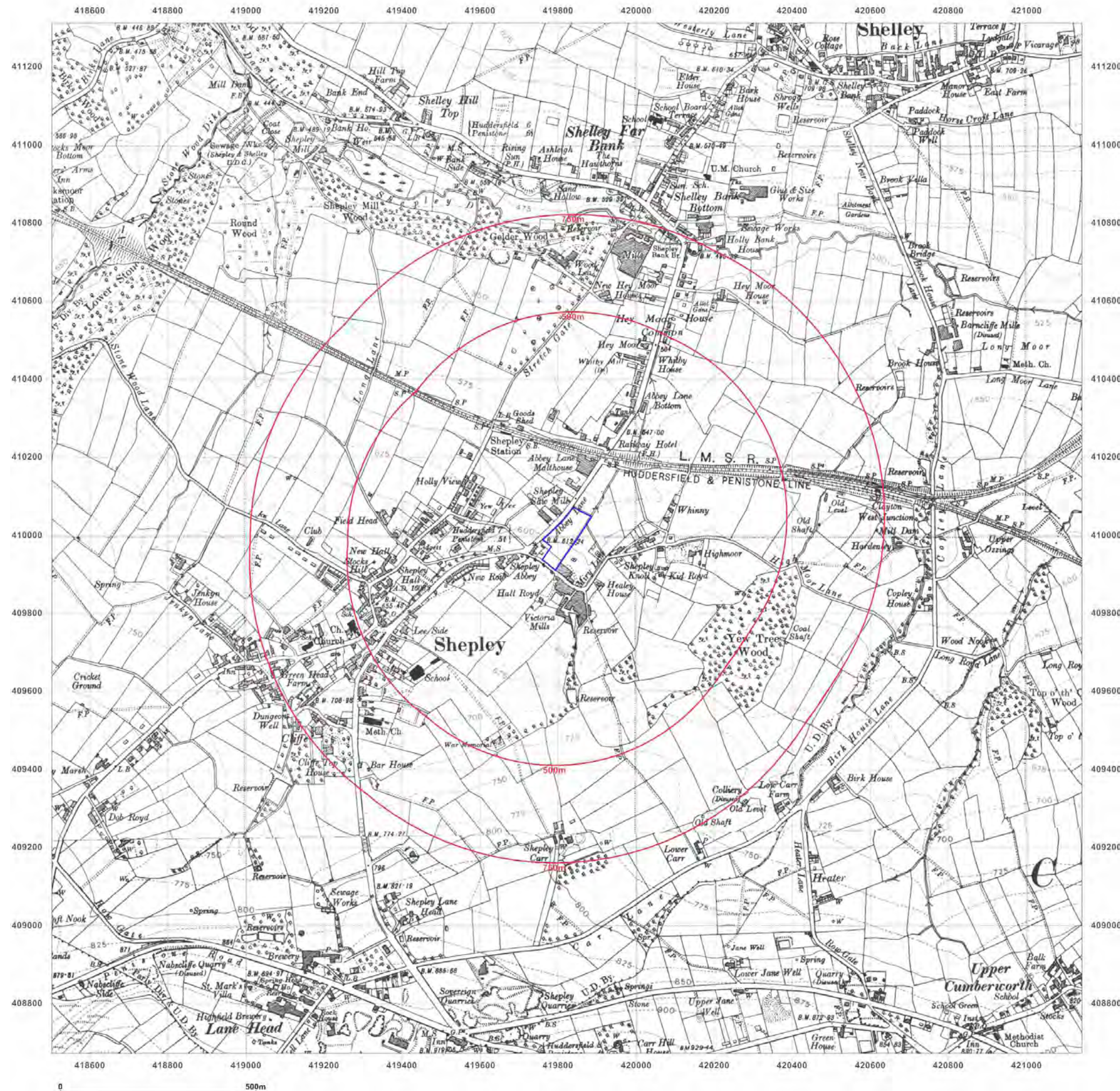


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: Provisional

Map date: 1951-1955

Scale: 1:10,560

Printed at: 1:10,560



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

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

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

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

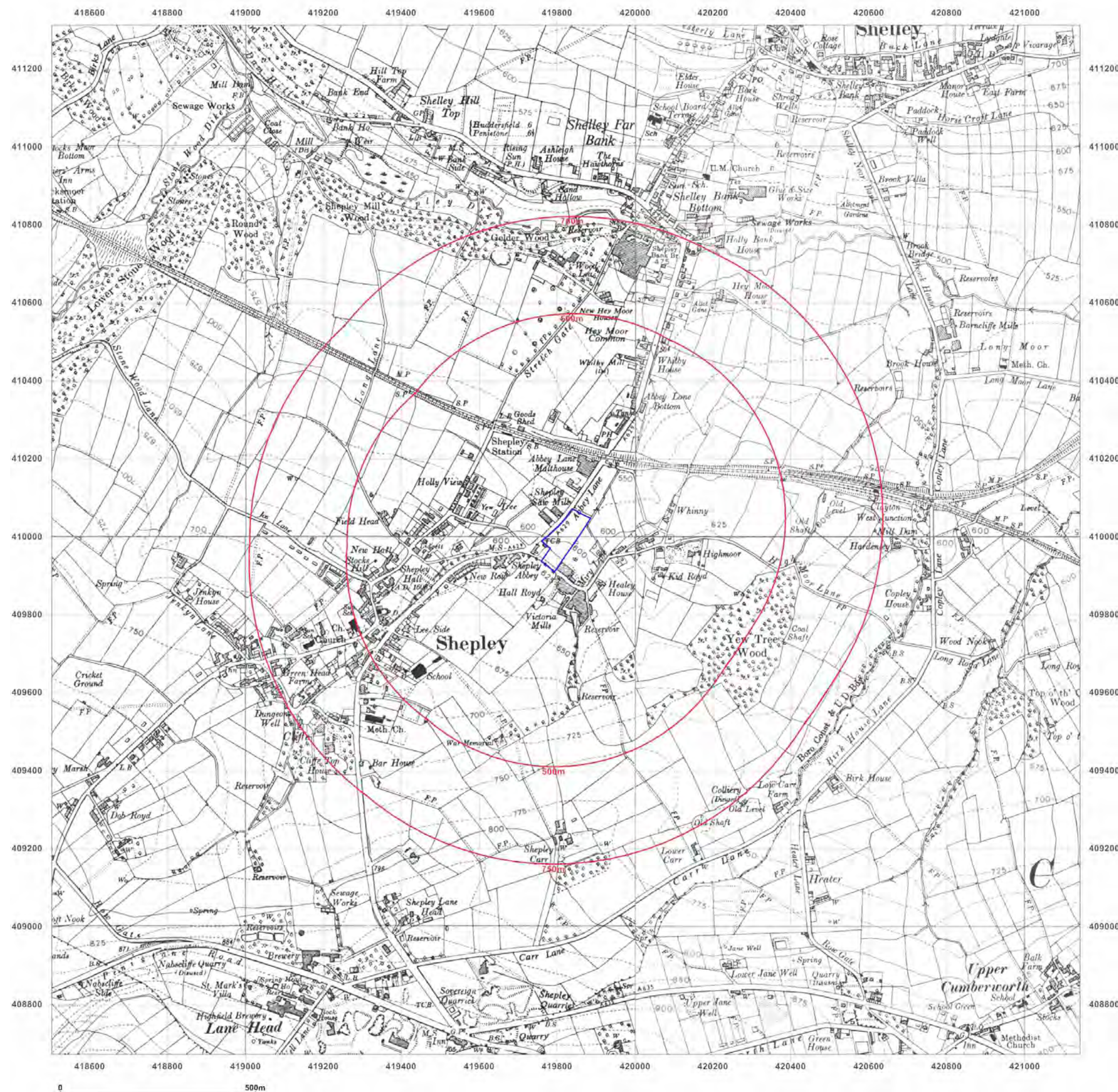


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1977-1980

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1977
 Revised 1977
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1977
 Revised 1979
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1976
 Revised 1980
 Edition N/A
 Copyright N/A
 Levelled N/A

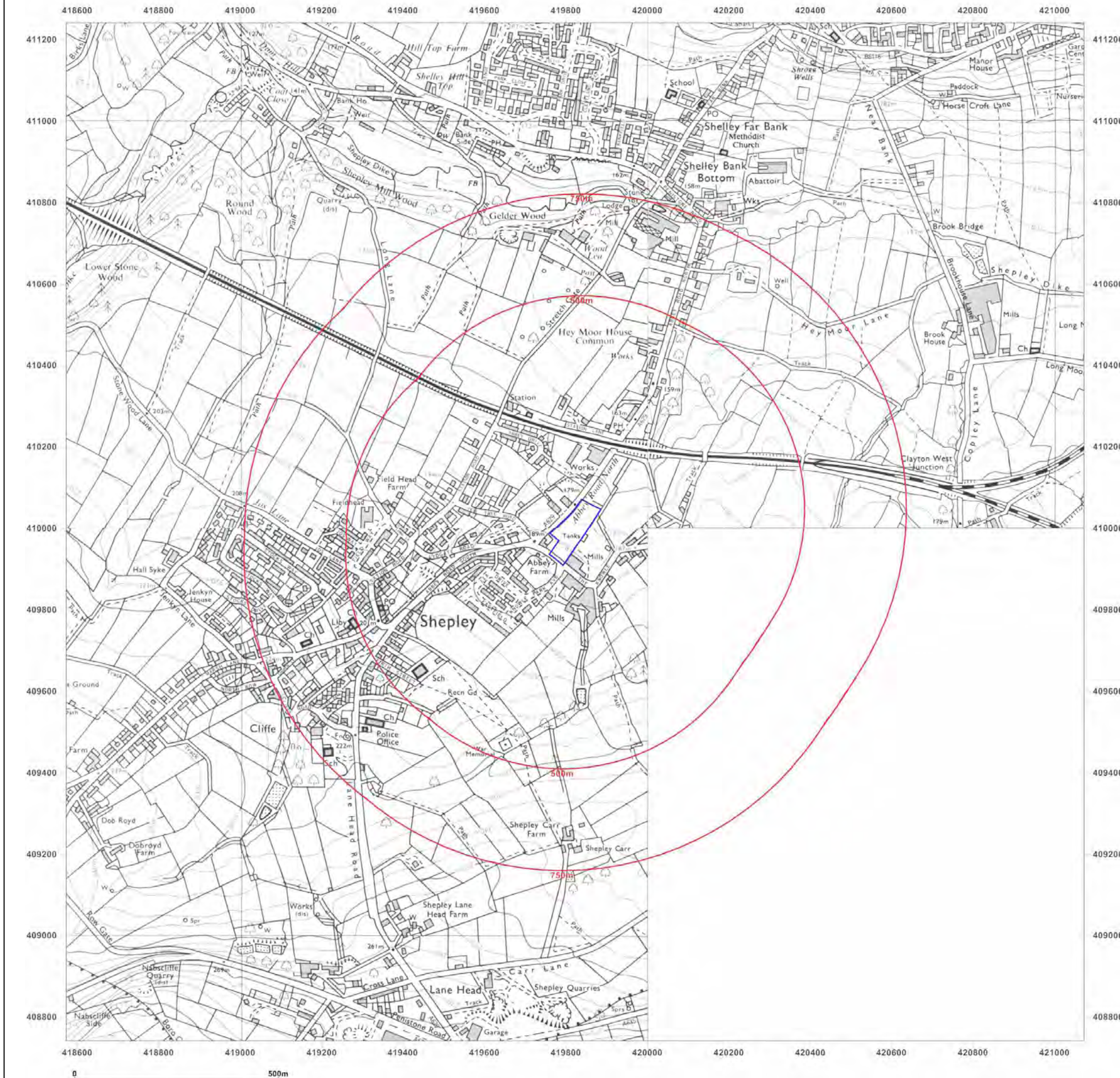


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Site Details:

419815, 410001

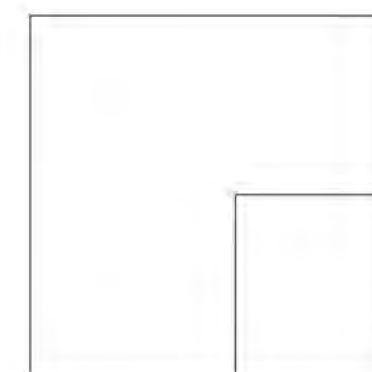
Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1983

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1980
 Revised 1983
 Edition N/A
 Copyright N/A
 Levelled N/A

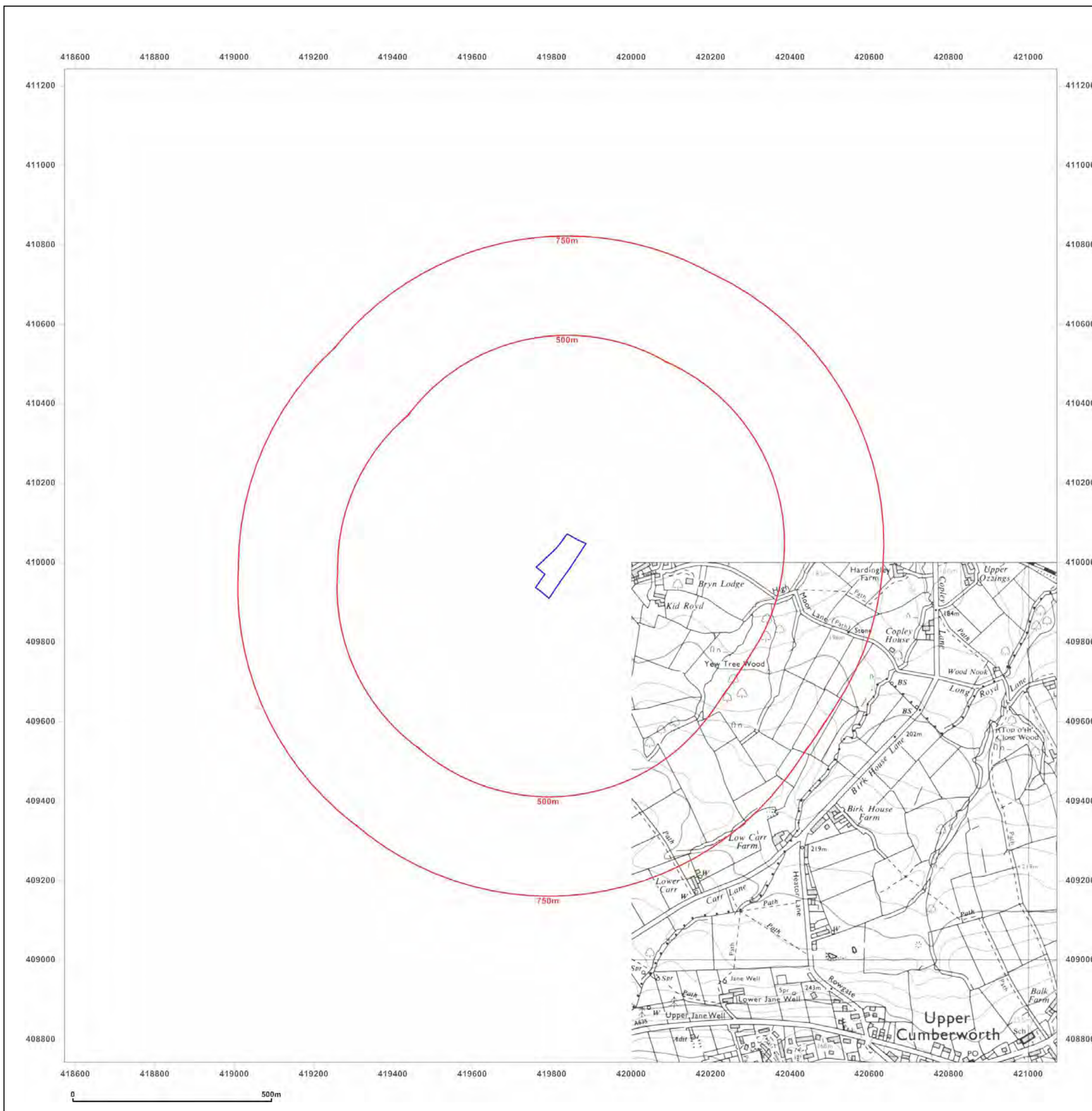


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1990-1993

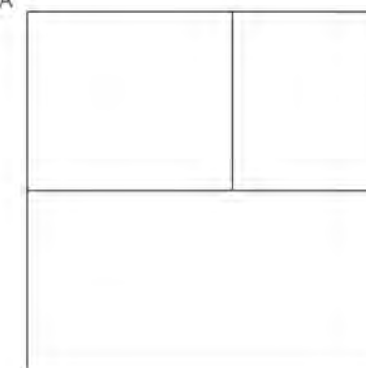
Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
 Revised 1990
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1990
 Revised 1993
 Edition N/A
 Copyright N/A
 Levelled N/A

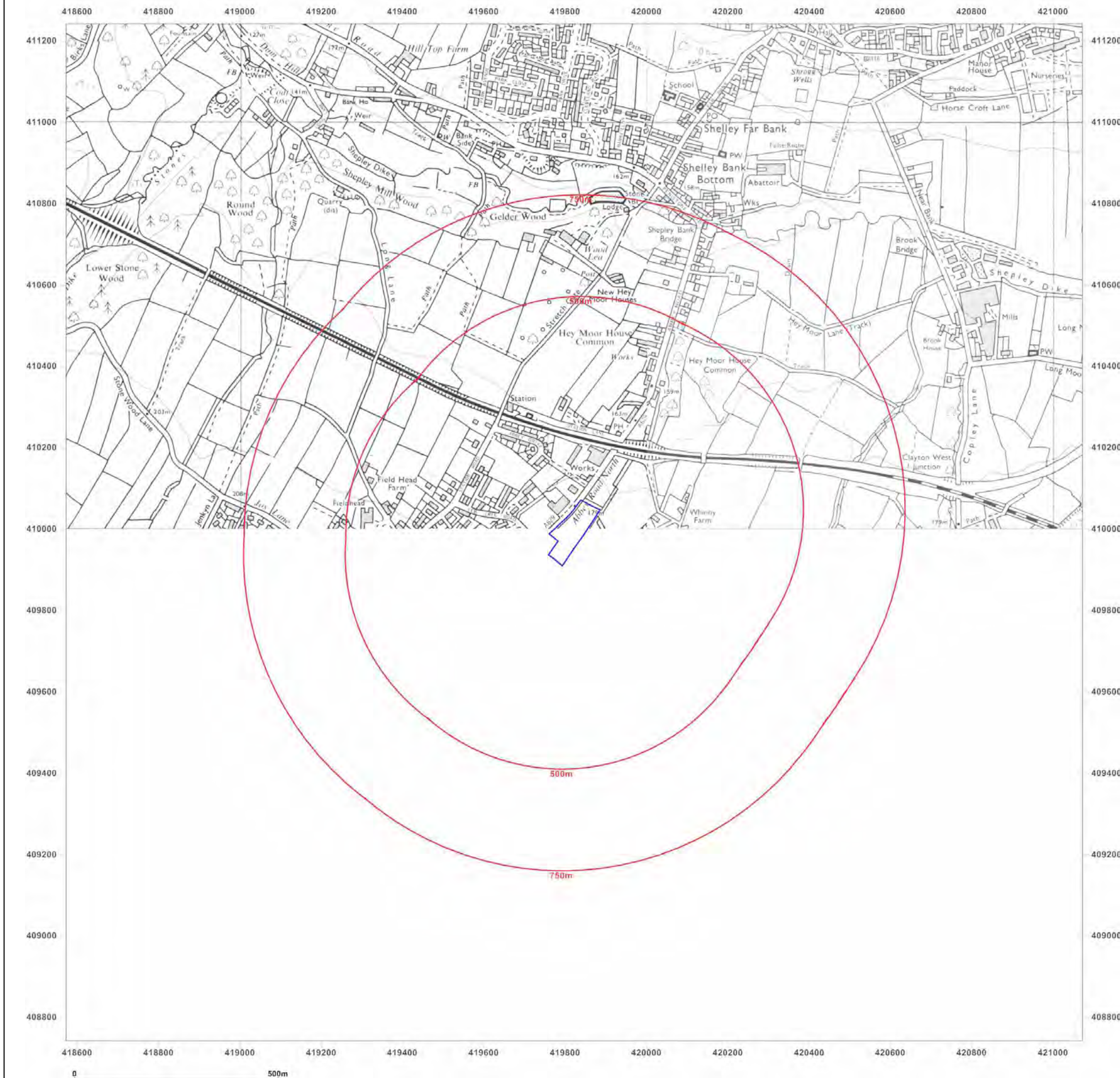


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Site Details:

419815, 410001

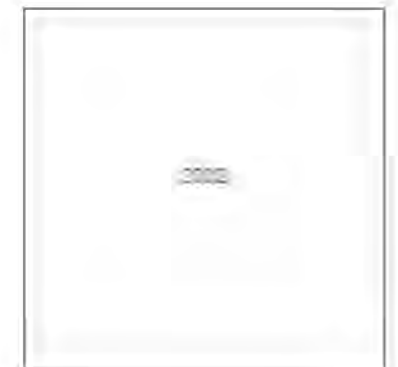
Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000

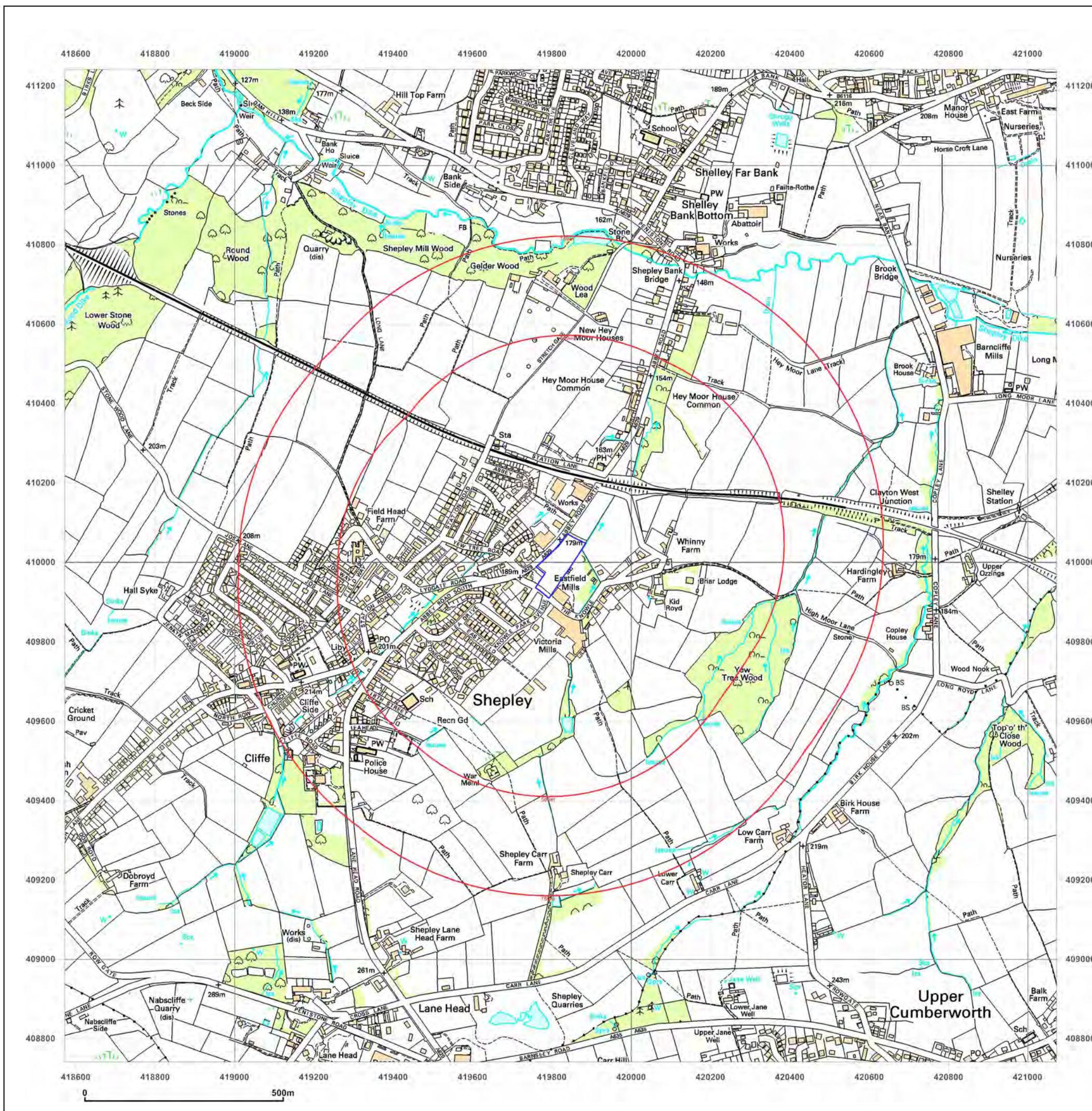


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000

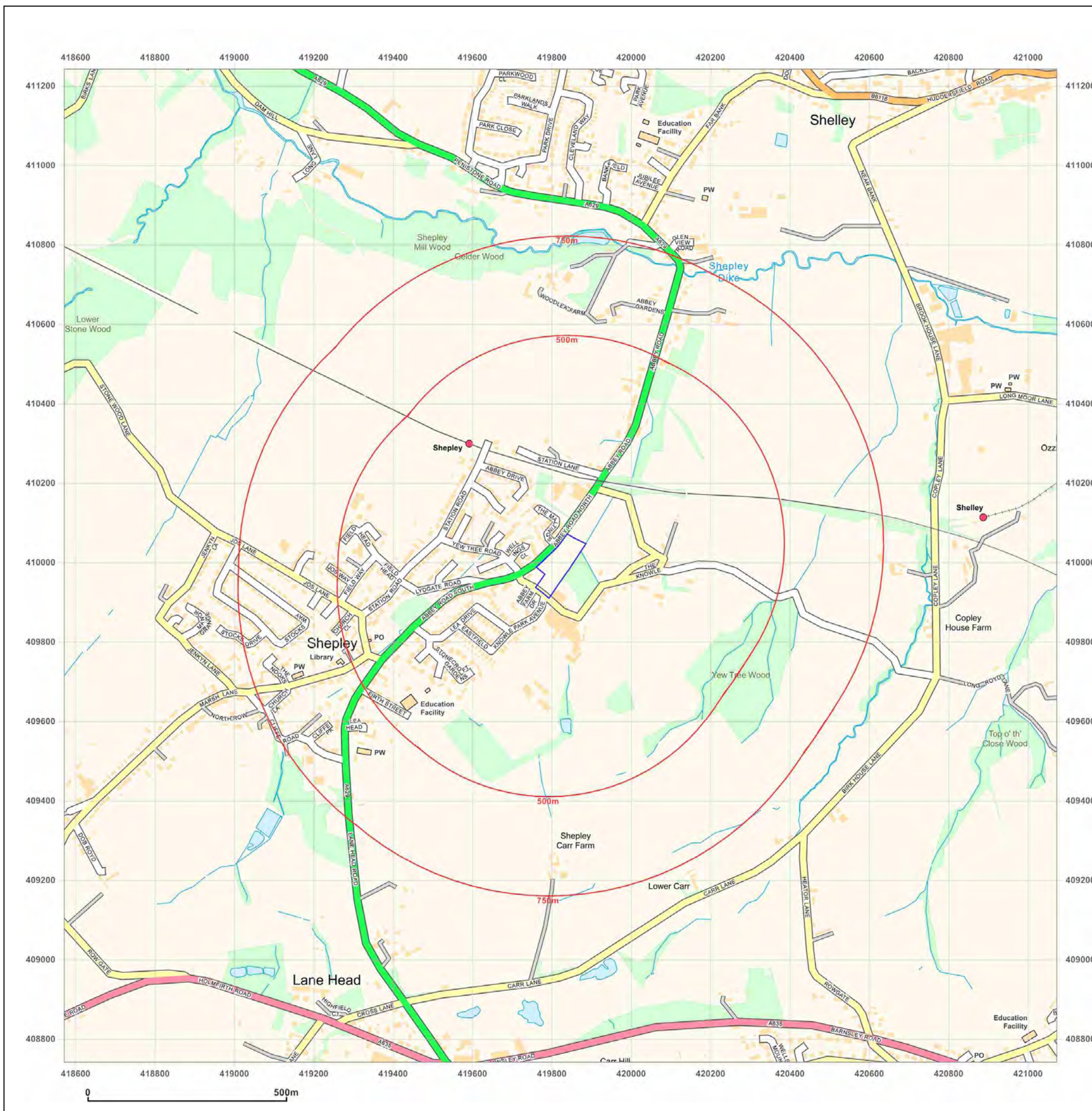


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: County Series

Map date: 1906

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1906
Revised 1906
Edition N/A
Copyright N/A
Levelled N/A

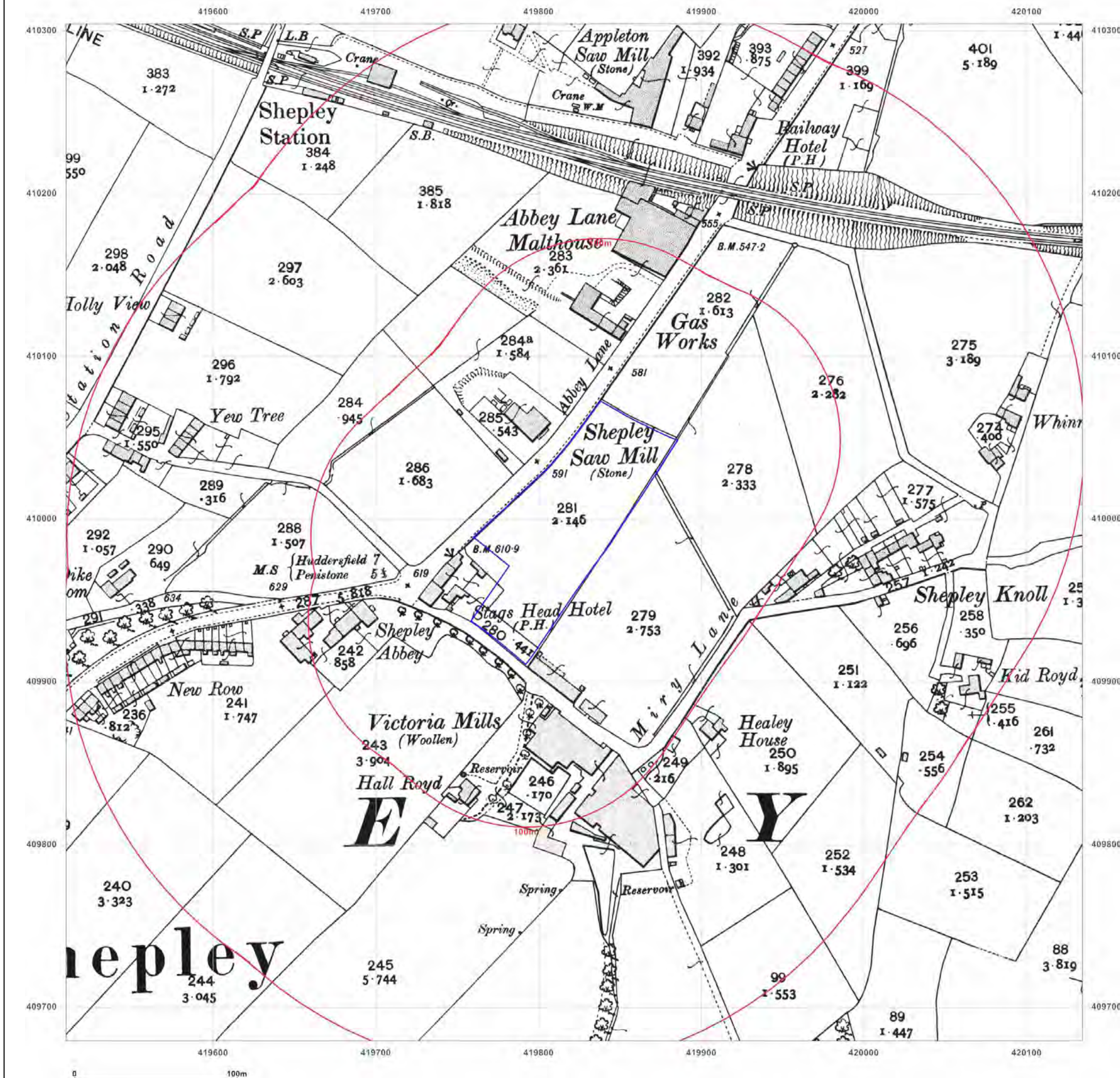


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1959

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1959
 Revised 1959
 Edition N/A
 Copyright 1960
 Levelled 1930

Surveyed 1959
 Revised 1959
 Edition N/A
 Copyright 1960
 Levelled 1930

Surveyed 1959
 Revised 1959
 Edition N/A
 Copyright 1960
 Levelled 1930

Surveyed N/A
 Revised 1959
 Edition 1959
 Copyright 1959
 Levelled 1930

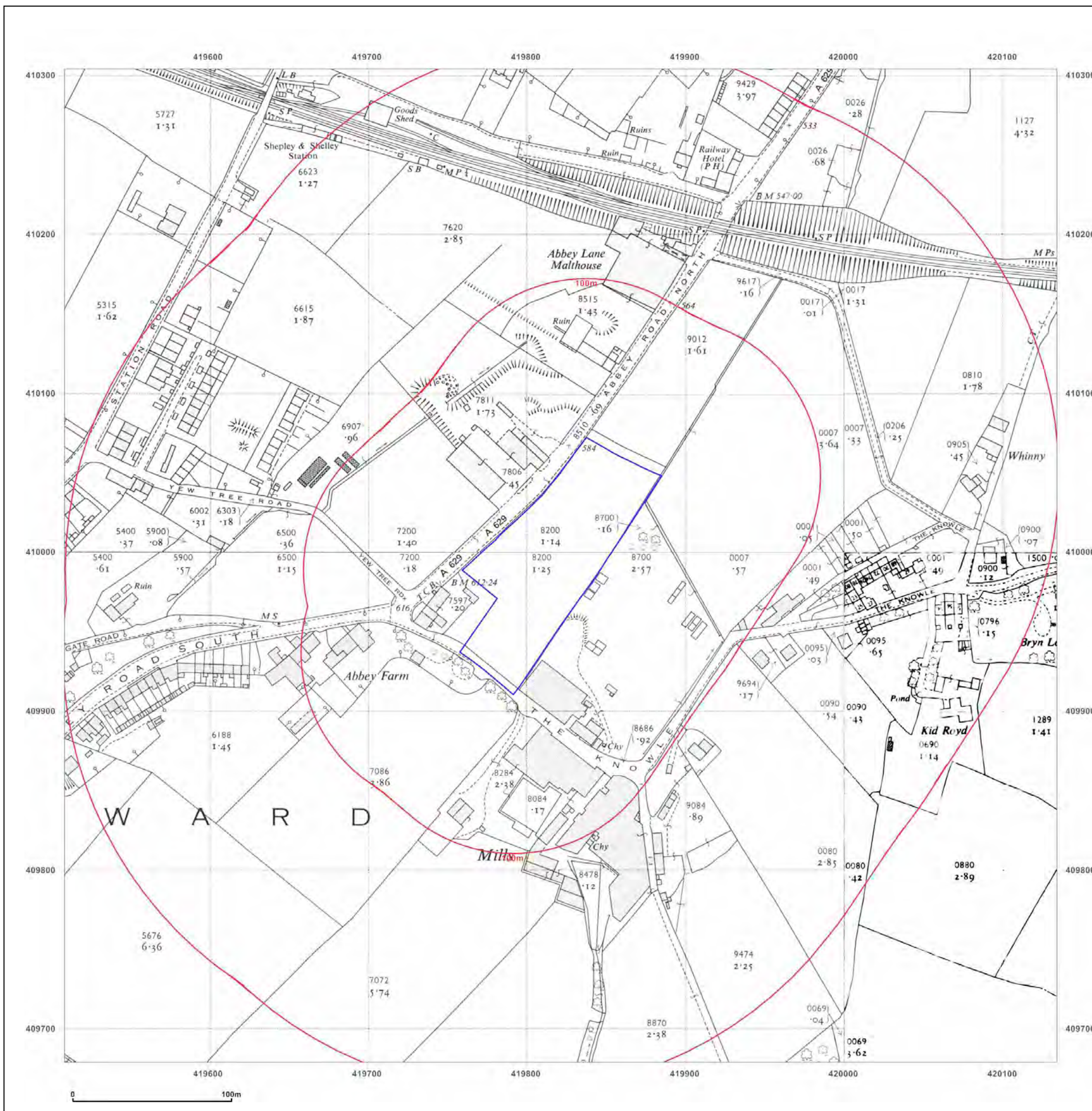


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

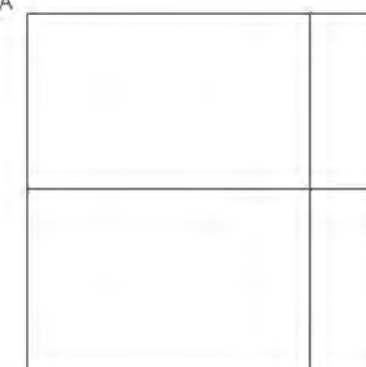
Map date: 1959-1960

Scale: 1:2,500

Printed at: 1:2,500



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



Surveyed 1959
 Revised 1959
 Edition N/A
 Copyright 1959
 Levelled 1930



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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1968

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1968
 Revised 1968
 Edition N/A
 Copyright 1969
 Levelled 1959



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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1969

Scale: 1:2,500

Printed at: 1:2,500



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



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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

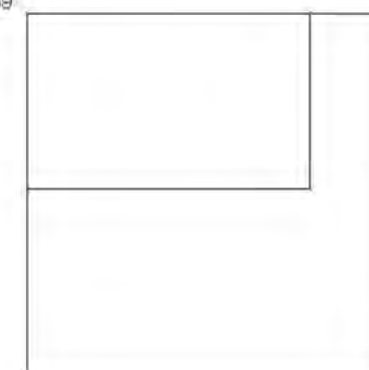
Map date: 1975

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1975
 Revised 1975
 Edition N/A
 Copyright 1976
 Levelled 1959

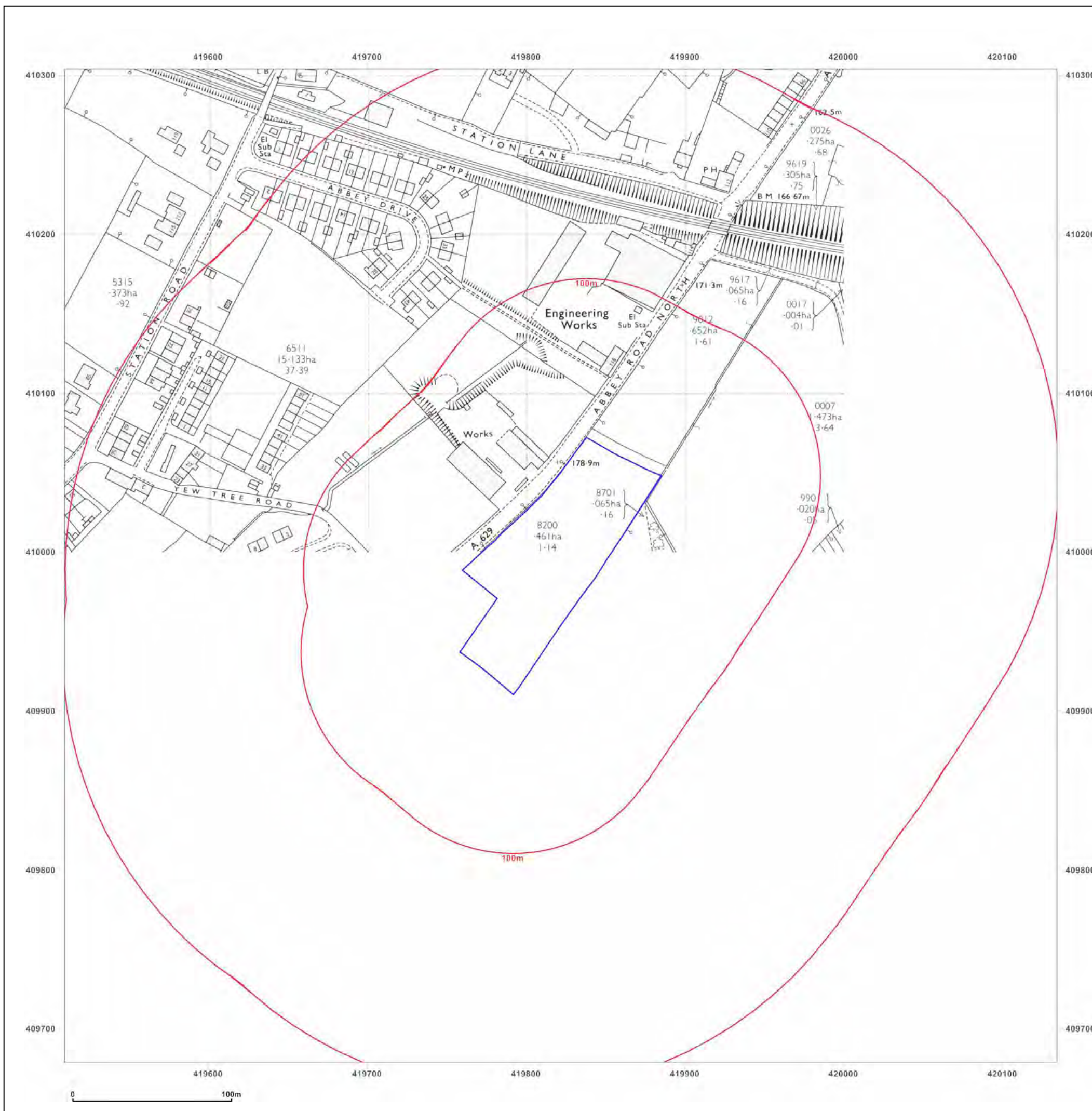


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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1975-1976

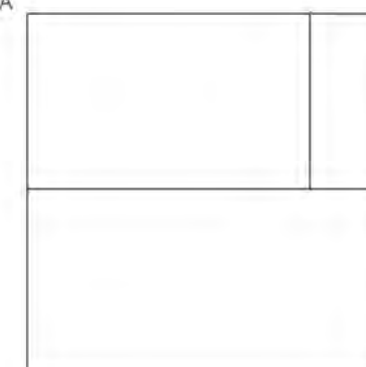
Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed 1976
 Revised 1976
 Edition N/A
 Copyright 1977
 Levelled 1958



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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

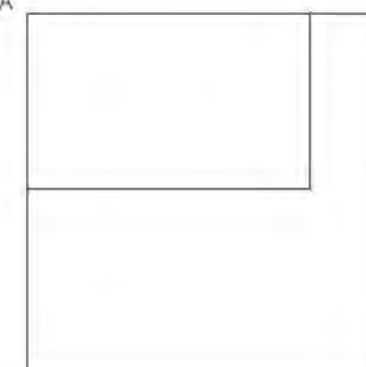
Map date: 1976

Scale: 1:2,500

Printed at: 1:2,500



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



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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1984-1987

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1959
 Revised 1987
 Edition N/A
 Copyright 1987
 Levelled 1959

Surveyed 1985
 Revised 1985
 Edition N/A
 Copyright 1987
 Levelled 1958

Surveyed 1959
 Revised 1984
 Edition N/A
 Copyright 1984
 Levelled 1959



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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1987-1992

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1992
 Levelled N/A

Surveyed 1958
 Revised 1987
 Edition N/A
 Copyright 1987
 Levelled 1958

Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright N/A
 Levelled N/A



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Site Details:

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Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

Map date: 1992-1994

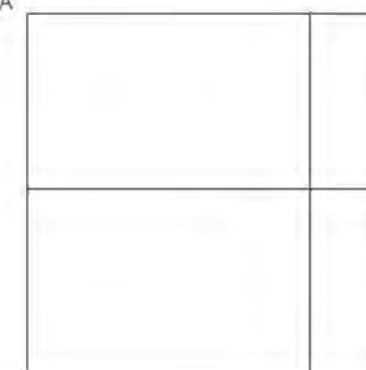
Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright N/A
 Levelled N/A



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



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Site Details:

419815, 410001

Client Ref: YORKSHIRE_COUNTRY_PROPERTIES_7465
Report Ref: GS-6047538
Grid Ref: 419822, 409992

Map Name: National Grid

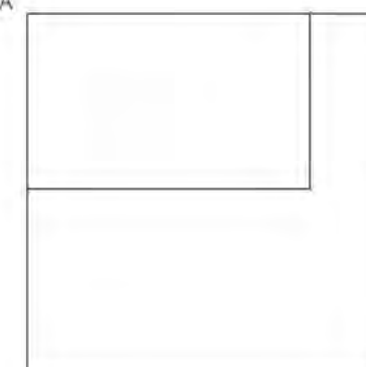
Map date: 1994

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1994
 Revised 1994
 Edition N/A
 Copyright 1994
 Levelled N/A



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