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# **Geo-environmental Ground Investigation Report**

**ON**

**PROPOSED DEVELOPMENT**

**AT**

**NEWSOME MILLS, RUTH STREET,  
HUDDERSFIELD**

**FOR**

**PANORAMA LIVING**

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**E19/7413/R001**

Prepared by

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## 0.0 **EXECUTIVE SUMMARY**

SITE	<p>The site is located on land to the north of Ruth Street, Newsome, Huddersfield.</p> <p>The shape of the site is irregular, and the majority of it consisted of levelled made ground from the demolition works. The levelled material had overspilled to the wooded banking to the north west of the site. The five storey brick and stone clock tower, and stone façade to the first floor of the former mill remain standing on site, along with the concrete floor slab. The site is generally level with a steep wooded banking down from the north west boundary.</p>
HISTORY	<p>The site was shown to be used as a woollen mill from 1854 to 2010 when demolition works had started. There has been primarily residential development in the immediate vicinity of the site.</p>
GEOLOGY	<p>The majority of the site is underlain by the Stanningley Rock formation consisting of sandstone. The north western edge of the site is underlain by the Pennine Lower Coal Measures Formation consisting of mudstone, siltstone and sandstone.</p> <p>There are no fault lines shown in the vicinity of the site.</p> <p>The site investigation works generally proved up to 4.5m of made ground overlying thin layers of clay and sandstone with a mudstone bedrock encountered at 2.5-4.5m below existing ground levels. In the deeper made ground in the west, sandstone boulders and large sections of concrete were noted. The mudstone strata extended to at least 30m below existing ground levels.</p>
MINING/QUARRYING	<p>The Coal Authority report states that the property is in a surface area that could be affected by underground mining in 1 seam of coal at 60m to 70m depth, and last worked in 1911. In addition 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.</p> <p>The boreholes undertaken to 30m depth found no evidence of coal or shallow workings. We would not therefore consider the site to be at risk from mining subsidence.</p>
HYDROLOGY	<p>The nearest recorded surface water features are two mill ponds 50m south east of the site.</p> <p>The site is not in an EA designated flood zone or shown to be at risk of flooding from rivers or the sea.</p>

HYDROGEOLOGY	<p>The groundwater vulnerability map for the area indicates that the site overlies bedrock designated as Secondary (A) aquifers.</p> <p>Perched groundwater was encountered in two trial pits during the site investigation. No groundwater strikes were recorded during the window sampling and groundwater was recorded in two of the rotary boreholes at 2.8 and 3.0m below existing ground levels.</p> <p>During the gas monitoring, water has been recorded at 1.0-3.1m below existing ground levels.</p>
HAZARDOUS GAS	<p>The property is not in an area requiring radon protection measures.</p> <p>Gas monitoring has been undertaken on five occasions to date and maximum methane and carbon dioxide concentrations of 0.6% and 7.4% have been recorded respectively. No flow rates have been detected.</p> <p>Based on the maximum concentrations and gas flow rates measured, the gas regime found on this site can be currently classified as Amber 1 by the NHBC traffic light system, or CS2 by BS 8485:2015 Table 2.</p>
CONTAMINATION	<p>Elevated levels of Lead up to 370mg/kg were recorded in the made ground of TP07 and TP08.</p> <p>Elevated levels of EPH and PAH compounds including Benzo(b)fluoranthene, Benzo(a)Pyrene and Dibenzo(a,h)anthracene were recorded at 1.40m in TP07.</p> <p>Six of the nine samples proved positive for asbestos.</p>
REMEDIATION	<p>It is recommended that remedial works are undertaken in the deeper areas of made ground to remove the large obstructions encountered during site investigation works.</p> <p>Due to the asbestos, a minimum of 1000mm of clean capping is required unless asbestos quantification is undertaken to prove the asbestos concentrations are sufficiently low. Where all made ground is removed to natural strata, a reduced clean capping depth of 300mm can be used.</p> <p>The depth of clean capping and material imported will need to be validated for inclusion in a remediation validation report.</p>
FOUNDATIONS	<p>It is recommended that piled foundations are used in the deeper area of made ground in the west of the site. This will need to be remediated to remove the large obstructions encountered during the site investigations. For the remainder of the site, strip/trench fill foundations to the underlying bedrock may be used.</p>

## **1.0 INTRODUCTION**

- 1.1 As requested by Panorama Living, this practice carried out ground and contamination investigation works for a proposed development at Newsome Mills, Ruth Street, Huddersfield.
- 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 Determine if shallow mine workings will adversely affect the development.
  - 1.2.5 Determine if ground gas migration from potential shallow mine workings beneath and adjacent the site will adversely affect the development.
- 1.3 Soil sampling was undertaken via trial pits and window samples 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, boreholes and window samples, which have not been revealed by the investigation.
- 1.5 Any opinion given on the possible configuration of strata between trial pit, borehole and window sample 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, boreholes or window samples 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, boreholes or window samples.

## **2.0    THE SITE**

- 2.1    The site is located on land at Ruth Street, Newsome Huddersfield and lies around OS Grid Reference 414349, 414893. A site location plan is attached in Appendix A at the rear of the report.
- 2.2    The shape of the site is irregular, with the north eastern boundary formed by Hart Street, south eastern by Ruth Street and the western boundary by adjacent woods. There are residential properties to the south, east and north east of the site. The site area is approximately 0.57ha.
- 2.3    At the time of the site investigation, the majority of the site consisted of levelled made ground left from previous demolition works. The levelling of the demolition rubble had extended beyond the extents of the site and onto the sloped woodland to the north west. A single storey stone façade and the concrete floor slab of the former mill building fronted onto Ruth Street, behind which stood the five storey brick and stone clocktower. There is gated access to the site from Ruth Street in the southern corner. The site is open onto Hart street on the north eastern boundary. Mature tree growth is present on the north western boundary.
- 2.4    The site has high points of approximately 160.5m AOD in the southern and northern corners of the site and falls to low points of approximately 158.2m and 158.5m AOD on the north western boundary and eastern corner respectively. A wooded banking falls away sharply from the north western boundary of the site, which had been overfilled with demolition rubble from site.

### 3.0 SITE HISTORY

A number of historical Ordnance Survey plans from 1854-2019 have been consulted. These are contained for reference within Appendix E to the rear of the report. Below is a brief description outlining the significant developments that may affect future construction of the site.

<b>Date</b>	<b>Historical uses on site</b>	<b>Historical findings within 100m perimeter of the site</b>	<b>Historical findings further than 100m perimeter of the site</b>
1854	i) Several buildings labelled woollen mill on site. ii) Buildings extend out south western corner and form part of Newsome.	i) Newsome centre 50m south west of site. ii) Tenterfields to north of site.	i) Old colliery 400m to south east. ii) Two sandstone quarries and coal pit 400m to north west.
1888-1891	i) Mill building occupies over 80% of site.	i) Mill ponds 50m south east and north east of site.	i) Old colliery, sandstone quarries and coal pit no longer shown.
1905	i) Features on site similar to previous plan.	i) Mill pond no longer shown 50m to the north east.	i) Quarry 375m east of site.
1930	i) Features on site similar to previous plan.	i) No significant land use changes within 100m of the site.	i) Quarry 375m east now shown as disused.
1938-1956	i) Features on site similar to previous plan.	i) Residential developments 25m east and 100m north west of site.	i) No significant land use changes further than 100m from the site
1965-1969	i) Features on site similar to previous plan.	i) No significant land use changes within 100m of the site.	i) Residential development 150m north east of site.
1984-1988	i) Features on site similar to previous plan.	i) School 100m north of site.	i) No significant land use changes further than 100m from the site
2002	i) Features on site similar to previous plan.	i) Residential development immediately north east of site.	i) No significant land use changes further than 100m from the site
2010-2014	i) Majority of mill on site demolished. Buildings shown in eastern corner and west of site.	i) No significant land use changes within 100m of the site.	i) No significant land use changes 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 has been consulted and we would report as follows:-
- 4.2 There are no areas of artificial or superficial strata shown overlying the site.
- 4.3 The majority of the site is underlain by the Stanningley Rock formation consisting of sandstone. The north western edge of the site is underlain by the Pennine Lower Coal Measures Formation consisting of mudstone, siltstone and sandstone.
- 4.4 There are no fault lines shown in the vicinity of the site.
- 4.5 A moderate risk of landslides is noted for the site due to the steep banking adjacent the north western boundary.
- 4.5 A copy of the coal mining report has been obtained and is enclosed within Appendix D. The report states that the property is in a surface area that could be affected by underground mining in 1 seam of coal at 60m to 70m depth, and last worked in 1911. Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.
- 4.6 In addition 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.
- 4.7 The property is not in an area for which a license has been granted to remove underground coal. The site is not in an area that could be affected by planned future workings. However coal reserves do exist in the local area that could be worked in the future.
- 4.8 There are no known coal mine entries within or within 20m of the boundary of the property.
- 4.9 The site is not within the boundary of a mine from which coal has been, or is being removed by opencast methods. No license requests are outstanding to remove coal by opencast methods within 800m of the site.

- 4.10 The coal authority online resources indicate a coal outcrop approximately 100m north west of the site. Probable shallow mine workings are shown to encroach on the north western boundary of the site.
- 4.11 There are no detailed deep BGS boreholes recorded in the vicinity of the site.

## **5.0 ENVIRONMENTAL CONSIDERATIONS**

### **5.1 Radon**

The property 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**

There are no historical landfill sites recorded within 250m of the site.

### **5.3 Flood Risk**

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

### **5.4 Groundwater**

The groundwater vulnerability map for the area indicates that the bedrock underlying the site is designated as a 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.

The site is not within a currently defined (Groundwater) Source Protection Zone (SPZ).

There are no licensed groundwater or surface water abstractions within 250m of the site.

There are no Licensed Discharge Consents within 250m of the site.

There are no recorded pollution incidents within 250m of the site.

The nearest surface water features are two mill ponds located approximately 50m south east of the site.

## **6.0 PRELIMINARY CONCEPTUAL SITE 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 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 Sources of potential contamination, that could affect the proposed development, from either on or off site activities would include the following:-
- i) Historical development and industrial use of site.
  - ii) Possible ground gas migration from shallow mine workings in vicinity of site.
  - iii) Materials from the demolition of the former building on site.
- Based on the above activities the potential for some contamination to exist on site is considered to be moderate.
- 6.5 Considering the proposed residential 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 girl).

- 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>
<b>Soil Ingestion</b>	YES	YES
<b>Consumption of Home Grown Vegetables</b>	YES	NO
<b>Dermal Contact</b>	YES	YES
<b>Dust Inhalation</b>	YES	YES
<b>Gases/Vapours</b>	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 Future site residents can be protected in the long term development of the site via a suitable remediation strategy that ensures any proposed contaminated materials remaining on-site are suitably isolated beneath an effective capping layer.
- 6.9 The risk of pollution to controlled waters by existing contamination is considered low. There have been no recorded pollution incidents to controlled waters related to the site. There are no local open watercourses located downhill of the site.
- 6.10 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.
- 6.11 The proposed planning drawings indicate residential construction. 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 Trial pit excavations were undertaken on the 3<sup>rd</sup> February 2020 using a 14 tonne tracked excavator with 600mm bucket. Ten trial pits were undertaken in total. In addition to this, eight window samples and five rotary boreholes were undertaken on site to determine the depth of made ground and presence of shallow mine workings. Six of the window samples and boreholes were fitted with gas monitoring stations to determine if ground gas generation would adversely affect the site.
- 7.2 Materials encountered in the trial pits, boreholes and window samples were examined and categorised. Trial pit, borehole and window sample logs are contained within Appendix B of the report.
- 7.3 The site investigation works were designed to achieve comprehensive site coverage within the proposed development area.
- 7.4 Soil samples were removed from the natural and made ground deposits within the trial pits and window samples. The samples were removed by operatives wearing gloves and placed into airtight clean plastic containers and glass bottles for transportation to the laboratory.
- 7.5 A total of nine 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.
- 7.6 A suite of common potential contaminants consisting of heavy metals, phytotoxic metals, sulphates, sulphides, extractable petroleum hydrocarbons and poly-aromatic hydrocarbons was analysed for, including a range of metals and inorganic substances and asbestos.
- 7.7 All samples were stored in airtight containers within cool boxes at approximately 4°C until delivery to the laboratory within 48 hours.

## **8.0 RESULTS OF THE INVESTIGATION**

### **8.1 GEOTECHNICAL INVESTIGATION**

- 8.1.1 A copy of the trial hole, borehole and window sample logs providing a complete record of strata encountered beneath the proposed development is presented in Appendix B.
- 8.1.2 The fieldwork generally proved relatively deep fill material overlying clays and sandstone with a mudstone bedrock.
- 8.1.3 The surface of all the trial pits consisted of made ground containing a mixture of clay, bricks, crushed brick, gravel, sandstone cobbles and boulders, ash, glass, timber, fabric and tree roots. For the majority of the site, this varied between 0.2 and 2.2m in depth. In TP02, TP03 and TP07 in the west of the site, the made ground was in excess of 2.5m, TP02 and TP03 terminated in the made ground at depths of 4.5m below existing ground levels. Anecdotally, the deeper areas of made ground are from infilled cellars. In TP01, a concrete slab was encountered at 0.9m below ground levels and the trial pit relocated.
- 8.1.4 In TP01A, TP04 and TP08, there was 0.2m to 1.2m thick layer of firm light brown sandy clay. TP08 terminated in this strata at a depth of 1.8m below existing ground levels.
- 8.1.5 Underlying the made ground in TP05, TP09 and TP10 and the clay in TP01A and TP04 a sandstone layer was encountered. This was a moderately weak to moderately strong light brown weathered sandstone excavated as horizontally bedded flags and angular cobbles. TP01A, TP04, TP05 and TP09 terminated in the sandstone strata at depths of 1.7m to 2.3m below existing ground levels where the sandstone became difficult to excavate. In TP10, the 0.7m thick sandstone layer was underlain by a 0.8m thick layer of soft light brown very sandy clay.
- 8.1.6 Below the made ground of TP06, TP07 and the clay of TP10 was a moderately strong light brown and grey weathered mudstone excavated as angular gravels. This was encountered at 2.2-2.5m below existing ground levels.

- 8.1.7 The rotary boreholes undertaken proved between 0.6m and 4.1m of made ground, occasionally overlying a 0.8-1.1m thick band of clay and 1.2-2.5m of sandstone. The 4.1m of made ground was in a single borehole in the west of the site, the other boreholes recorded less than 2.8m of made ground. Mudstone bedrock was encountered at 2.5-4.3m below existing ground levels and extended to 30m below ground level. BH01 and BH04 were undertaken on site closest to the recorded outcrop and extended to a depth of 30m. No evidence of coal or workings was encountered.
- 8.1.8 The window samples proved the depth of made ground varied between 0.4m and 1.0m across site, and was generally underlain by 0.3-1.2m of sandy clay.
- 8.1.9 In WS01 and WS02 in the central northern areas of the site a mudstone layer was encountered at 1.0-2.0m below existing ground levels. In the remainder of the site, a sandstone layer was encountered at 0.4-2.15m below existing ground levels.
- 8.1.10 Standard Penetration Test 'N' values taken at 1.0m depth increments within the window samples and boreholes and are summarised in Table 2 below:-

**Table 2 Summary of SPT (N Values)**

Depth (m)	0.70-1.15	1.00-1.45	1.40-1.85	1.50-1.95	1.80-2.25	2.00-2.45	2.80-3.25
WS01	-	21	-	-	-	REFUSAL	-
WS02	-	10	-	-	-	36	REFUSAL
WS03	-	33	REFUSAL	-	-	-	-
WS04	-	15	-	-	-	REFUSAL	-
WS05	-	32	-	REFUSAL	-	-	-
WS06	-	32	-	REFUSAL	-	-	-
WS07	-	REFUSAL	-	-	-	-	-
WS07A	REFUSAL	-	-	-	-	-	-
WS08	-	28	-	-	REFUSAL	-	-

- 8.1.11 The SPT results showed the overlying fill to be mostly well compacted with occasional soft spots. Refusals were generally noted in the underlying mudstone.
- 8.1.12 The result of the geotechnical analysis undertaken on the sample of clayey soil indicates the clay to be of intermediate plasticity (Plasticity Index 34%). 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. The test certificates are contained in Appendix C.

## **8.2 GROUNDWATER**

- 8.2.1 Perched groundwater was encountered in the made ground of TP05 and TP07 at depths of 0.9m and 1.8m below existing ground levels respectively. No groundwater was recorded in the remaining trial pits.
- 8.2.2 During the window sampling, no groundwater strikes were recorded. Groundwater strikes were recorded in two of the eight rotary boreholes at 2.8m and 3.0m below existing ground levels.
- 8.2.3 During the gas monitoring, groundwater has been recorded at 1.0-3.1m below existing ground levels.
- 8.2.4 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, BH02, BH04, WS02, WS04 and WS08 were installed with gas standpipes and lockable covers. Gas testing is currently being undertaken on site and to-date the wells have been monitored on four occasions following the installation of the standpipes.
- 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 to-date is summarised in Table 3 below. A complete set of results will be reported on completion of the intended testing programme.

**Table 3 - Summary of Recorded Gas Levels.**

Borehole No.	Date	Oxygen %	Carbon Dioxide %	Methane %	Flow Rate (l/hr)	Depth to Water (m)	Atmospheric Pressure (mb)
BH01	05.03.20	19.0	1.0	ND	ND	DRY	974
	18.03.20	19.4	1.0	ND	ND	3.1	1001
	14.04.20	18.8	1.4	ND	ND	DRY	1006
	09.07.20	19.3	1.5	ND	ND	2.8	994
	23.07.20	19.3	2.3	ND	ND	DRY	990
BH02	05.03.20	18.3	1.4	ND	ND	2.0	974
	18.03.20	19.3	0.9	ND	ND	2.1	1001
	14.04.20	UNABLE TO TAKE READING – TAP TAMPERED WITH					
	09.07.20	UNABLE TO TAKE READING – TAP TAMPERED WITH					
	23.07.20	16.3	3.8	ND	ND	2.8	990
BH04	05.03.20	18.7	0.4	0.6	ND	DRY	973
	18.03.20	19.4	0.3	0.1	ND	2.2	999
	14.04.20	17.3	0.7	ND	ND	DRY	1006
	09.07.20	UNABLE TO TAKE READING – TAP TAMPERED WITH					
	23.07.20	20.3	0.7	ND	ND	DRY	990
WS02	05.03.20	17.7	1.6	ND	ND	1.9	973
	18.03.20	18.4	1.5	ND	ND	DRY	1000
	14.04.20	15.2	2.1	ND	ND	2.7	1007
	09.07.20	UNABLE TO TAKE READING – TAP TAMPERED WITH					
	23.07.20	16.7	2.9	ND	ND	2.4	990
WS04	05.03.20	12.2	5.5	ND	ND	DRY	976
	18.03.20	14.6	6.0	ND	ND	DRY	1002
	14.04.20	12.8	7.4	ND	ND	1.90	1007
	09.07.20	UNABLE TO TAKE READING – TAP TAMPERED WITH					
	23.07.20	9.4	9.3	ND	ND	DRY	990
WS08	05.03.20	18.1	1.3	ND	ND	DRY	973
	18.03.20	19.3	0.9	ND	ND	1.70	1000
	14.04.20	16.4	2.4	ND	ND	DRY	1006
	09.07.20	UNABLE TO TAKE READING – TAP TAMPERED WITH					
	23.07.20	16.7	3.5	ND	ND	DRY	990

8.3.4 It has not been possible to take readings from all stations on the visits to site due to the installations being vandalised and high groundwater levels putting the machine at risk of flooding.

- 8.3.5 A maximum carbon dioxide concentration of 9.4% was recorded in WS04 and a maximum methane concentration of 0.6% in BH04. No flow rates were detected in the monitoring stations.
- 8.3.6 Based on the maximum concentrations of carbon dioxide recorded, the gas regime found on this site can be currently classified as **Amber 1** by the NHBC traffic light system, or **CS2** by BS 8485:2015 Table 2.
- 8.3.7 The gas monitoring is ongoing and a final report confirming any gas protection measures required will be prepared when the monitoring is completed.

## **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 the CLEA SGV's for residential use with plant uptake, as these are considered to be the most suitable guidelines to protect the most critical targets from contaminants via all possible exposure routes.
- 9.2.4 Where no CLEA SGV has been published, Generic Assessment Criteria (GAC) based on guidelines from the Chartered Institute of Environmental Health (CIEH) and Land Quality Management Ltd (LQM) S4UL document residential land use with plant uptake has been used. Where there is no GAC, guidance limits have been adopted from sources referenced in the table below.
- 9.2.5 A new approach has now been adopted for the calculation of SGV based on an acceptably low level of risk. 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.
- 9.2.6 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.
- 9.2.7 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.
- 9.2.8 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**

<b><u>CONTAMINANT</u></b>	<b><u>SGV</u></b> <b><u>MG/KG</u></b>	<b><u>CONCENTRATION IN</u></b> <b><u>ALL SOILS.</u></b> <b><u>MG/KG</u></b>	<b><u>No. OF</u></b> <b><u>SAMPLES</u></b> <b><u>EXCEEDING</u></b> <b><u>GUIDANCE</u></b> <b><u>VALUES</u></b>	<b><u>PERCENTAGE</u></b> <b><u>OF SAMPLES</u></b> <b><u>EXCEEDING</u></b> <b><u>GUIDELINE</u></b> <b><u>VALUE</u></b>
<b>Arsenic</b>	37 (4)	5.7-18	0/9	
<b>Cadmium</b>	22 (4)	0.2-3.4	0/9	
<b>Chromium (Total)</b>	130 (2)	18-46	0/9	
<b>Lead</b>	200 (4)	32-370	3/9	33.3%
<b>Mercury (Total)</b>	1.2 (1)	0.06-0.78	0/9	
<b>Selenium</b>	250 (1)	<0.5	0/9	
<b>Copper</b>	2400 (1)	34-110	0/9	
<b>Nickel</b>	180 (1)	16-34	0/9	
<b>Zinc</b>	3700 (1)	57-390	0/9	
<b>Sulphate</b>	0.24 (3)	0.03-0.35	1/9	11.1%
<b>Thiocyanate</b>	50	<0.6-0.7	0/9	
<b>Sulphide</b>	250	<10-100	0/9	
<b>Naphthalene</b>	2.3 (1)	<0.1-0.4	0/9	
<b>Benzo(a)pyrene</b>	5 (4)	<0.1-5.2	1/9	11.1%
<b>PAH (Total)</b>	40	1.6-26	0/9	
<b>EPH (Total)</b>	250	<10-5400	1/3	33.3%
<b>Phenols</b>	760 (1)	<0.3-0.5	0/9	
<b>Asbestos</b>	No fibres	Chrysotile bundles	6/9	66.6%
<b>pH</b>	6-8	6.9-11.8	8/9	88.8%

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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

9.2.9 Elevated levels of Lead up to 370mg/kg were recorded in the made ground of TP07 and TP08.

9.2.10 There were no elevated levels of phytotoxic metals.

9.2.11 Elevated levels of PAH compounds including Benzo(b)fluoranthene, Benzo(a)Pyrene and Dibenzo(a,h)anthracene were recorded at 1.40m in TP07.

9.2.12 Speciated analysis has been undertaken on the sample from TP07 at a depth of 1.4m showing elevated levels of EPH (Total) and the results are shown in Table 5 below :-

**Table 5**

**Comparison of recorded contaminant levels against speciated EPH LQM S4UL screening values for residential use with plant uptake.**

<b>Petroleum Hydrocarbons</b>	<b>LQM S4UL Screening Values (mg/kg)</b>	<b>Recorded Concentrations</b>	<b>No. of samples exceeding Screening Values</b>
<b>Aliphatics</b>			
C5-C6	42	<0.01	0/1
C6-C8	100	<0.01	0/1
C8-C10	27	<0.01	0/1
C10-C12	130 (38)	<1.5	0/1
C12-C16	1100 (24)	14	0/1
C16-C35	65000 (8.48)	1388	0/1
<b>Aromatics</b>			
C5-C7	70	<0.01	0/1
C7-C8	130	<0.01	0/1
C8-C10	34	<0.01	0/1
C10-C12	74	<0.9	0/1
C12-C16	140	9.9	0/1
C16-C21	260	<110	0/1
C21-C35	1100	1200	1/1

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9.2.13 The speciated EPH analysis proved that of the individual carbon bands, only the C21-C35 Aromatic band exceeds its tier 1 trigger level.

9.2.14 Asbestos fibres in the form of Amosite or Chrysotile was proven in six of the nine samples taken from site.

9.2.15 A single elevated sulphate concentration of 0.35% was recorded in the fill material in TP01 at a depth of 0.5m. This corresponds to a design sulphate class DS-2, ACEC

class AC-2, 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 Lead
- ii) Elevated levels of PAH compounds
- iii) Elevated level of Aromatic C21-C35 (Petroleum Hydrocarbon)
- iv) Bundles of amosite and chrysotile fibres (asbestos).

#### 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 from localised ground contamination on-site.

Elevated levels of Lead up to 370mg/kg were recorded in the made ground of TP07 and TP08.

There were no elevated levels of phytotoxic metals.

Elevated levels of PAH compounds including Benzo(b)fluoranthene, Benzo(a)Pyrene and Dibenzo(a,h)anthracene were recorded at 1.40m in TP07.

The speciated EPH analysis of the sample from TP07 proved that of the individual carbon bands, only the C21-C35 Aromatic band exceeds its tier 1 trigger level.

Significant spread of Asbestos in the form of Amosite or Chrysotile was proven in six of the nine samples taken from site.

As there is no suitable topsoil on site, clean material will need to be imported to provide a growing medium for the garden areas. Due to the presence of asbestos on site, the clean capping layer should consist of a minimum of 150mm topsoil overlying 850mm of subsoils for a total clean cover of 1000mm. Potentially, asbestos quantification analysis could be undertaken to reduce the depth of clean capping required should the asbestos concentration prove sufficiently low.

Where made ground is removed to the underlying natural strata, a reducing capping layer of 150mm topsoil and 150mm subsoil may be used to provide a minimum of 300mm growing medium to soft landscaped areas.

A maximum carbon dioxide concentration of 9.4% was recorded in WS04 and a maximum methane concentration of 0.6% in BH04. No flow rates were detected in the monitoring stations.

Based on the maximum concentrations of carbon dioxide recorded, the gas regime found on this site can be currently classified as **Amber 1** by the NHBC traffic light system, or **CS2** by BS 8485:2015 Table 2.

The gas monitoring is ongoing and a final report confirming any gas protection measures required will be prepared when the monitoring is completed.

## **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. However, any site workers should be made aware of the asbestos present within the made ground on 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**

There have been no recorded instances of pollution to controlled waters associated with the contamination on site, it is therefore considered to be non-migratory. There are no groundwater abstractions located within 250m of the site. The site has been shown to have a relatively impermeable mudstone bedrock.

**iv) Building Structures.**

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.

A single elevated sulphate concentration of 0.35% was recorded in the fill material in TP03 at a depth of 0.9m. This corresponds to a design sulphate class DS-2, ACEC class AC-2, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".

## **10.0 CONCLUSIONS AND RECOMMENDATIONS**

### **10.1 GEOTECHNICAL ASSESSMENT**

10.1.1 The fieldwork generally proved made ground and clays overlying a sandstone or mudstone bedrock. However, in the western area of the site, the depth of made ground was proved up to 4.5m. For initial design purposes we would envisage a safe bearing capacity of 100kN/m<sup>2</sup> where foundations are cited onto the firm clay strata and 150kN/m<sup>2</sup> where foundations are extended onto the weathered mudstone or sandstone strata.

10.1.2 We would therefore initially suggest that the site is divided into two separate areas. In the deeper areas of made ground in the west, piled foundations will be required. For the remainder of the site, strip/trench fill footings may be adopted.

#### **10.1.3 DEEPER MADE GROUND IN WEST OF SITE**

10.1.3.1 The ground investigation proved up to 4.5m of very loosely compacted demolition material in the west of the site. The made ground material was variable in nature, including large sections of concrete and brickwork, and in areas was unconsolidated leading to instability within the trial pits in this area. The approximate extent of made ground has been indicated on the site investigation plan in Appendix A.

10.1.3.2 The made ground is not considered a suitable foundation material and therefore all loadings should be taken through these materials onto suitable underlying strata. Due to the large nature of some of the material within this area of the site, further remediation is recommended to allow the piling to be undertaken unobstructed.

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 deeper made ground, the proposed low rise residential constructions should be constructed on strip/trench fill footings founded entirely onto the 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. Where strip foundations are used, the excavations will require to be widened due to the loose nature of the fill material.
- 10.1.4.2 All foundations should be placed below a line of 45° drawn up from the base of any services or other structures.
- 10.1.4.3 Where 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.
- 10.1.4.4 Perched groundwater was encountered during the trial pitting, and relatively high groundwater was encountered in the rotary boreholes. However, at present it is not expected that excessive ground water control measures will be required during winter months. 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.
- 10.1.5 A single elevated sulphate concentration of 0.35% was recorded in the fill material in TP03 at a depth of 0.9m. This corresponds to a design sulphate class DS-2, ACEC class AC-2, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".
- 10.1.6 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.

## **10.2 MINING AND QUARRYING**

10.2.1 The Coal Authority Report states that the property is in a surface area that could be affected by underground mining in 1 seam of coal at 60m to 70m depth, and last worked in 1911. In addition 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.

10.2.2 The two boreholes taken to 30m depth recorded no coal seam or evidence of former workings. 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 can therefore confirm that the site has greater than ten times seam thickness of competent rock cover, and this property should not be at risk from mining subsidence in accordance with Ciria SP32.

## **10.3 SURFACE WATER DRAINAGE**

10.3.1 Due to the depth of made ground encountered on the majority of the site, infiltration methods would not be considered a suitable method of surface water disposal. In addition to this, the shallow depth of sandstone encountered in parts of the site was underlain by mudstone bedrock, so dispersal of water is likely to be lateral. Due to the steep banking down to the northwest of the site, there is a possibility of the re-emergence of water leading to flooding issues to the north west of the site.

10.3.2 We would therefore not consider infiltration methods a suitable form of surface water disposal for this site. Yorkshire Water and the LLFA should be approached to agree a suitable discharge location and rate in accordance with SUDS guidelines.

## **10.4 GROUND FLOOR SLAB – GAS MEASURES**

10.4.1 As discussed previously, gas monitoring stations were installed in six of the window sample and borehole locations on site due to the possibility of ground gas migration from shallow mine workings in the vicinity of the site.

10.4.2 A maximum carbon dioxide concentration of 9.4% was recorded in WS04 and a maximum methane concentration of 0.6% in BH04. No flow rates were detected in the monitoring stations..

10.4.3 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*. Based on the maximum concentrations of carbon dioxide recorded, the gas regime found on this site can be currently classified as **Amber 1** by the NHBC traffic light system, or **CS2** by BS 8485:2015 Table 2.

10.4.4 No Radon Protection measures are required for the site.

10.4.5 Due to the presence of trees immediately adjacent the site, and the depth of fill exceeding 600mm, a suspended beam & block floor will be required for the properties in accordance with NHBC Chapter 4.2. Consulting BS 8485:1015 tables 5-7 we would consider it necessary to adopt the following construction details for a CS2 gas regime, to achieve a score of **4.5 points**:

- Fully vented minimum 250mm deep void below suspended slab. **2.5 Points**
- Continuous membrane across the cavity/party walls. **0 Points**
- Cavity tray in the external walls. **0 Points**
- Fully sealed service entries and ducts to manufactures specification. **0 Points**
- Beam and block floor construction **0 Points**
- A Visqueen Gas Barrier meeting all of the following criteria:
  - Sufficiently impervious to gasses with a methane gas transmission rate <40.0ml/day/m<sup>2</sup>/atm (average) for sheets and joints (tested in accordance with BS ISO 15105-1 manometric method).
  - Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions.
  - Sufficiently strong to withstand in-service stresses (eg. Settlement if placed below a floor slab).
  - Sufficiently strong to withstand the installation process and following trades until covered (eg. Penetrations from steel fibres in fibre reinforced concrete, penetration from reinforcement ties, tearing due to Working above it, dropping tools etc.)

- Capable, after installation, of providing a complete barrier to the entry of the relevant gas.

- Verified in accordance with CIRIA C735 [N1]

**2.0 Points**

Total

**4.5 Points**

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

## **10.5 CONTAMINATION ASSESSMENT**

10.5.1 Elevated levels of Lead up to 370mg/kg were recorded in the made ground of TP07 and TP08.

10.5.2 There were no elevated levels of phytotoxic metals.

10.5.3 Elevated levels of PAH compounds including Benzo(b)fluoranthene, Benzo(a)Pyrene and Dibenzo(a,h)anthracene were recorded at 1.40m in TP07.

10.5.4 The speciated EPH analysis proved that of the individual carbon bands, only the C21-C35 Aromatic band exceeds its tier 1 trigger level.

10.5.5 Asbestos in the form of Amosite or Chrysotile was proven in six of the nine samples taken from site.

10.5.6 As there is no suitable topsoil on site, clean material will need to be imported to provide a growing medium for the garden areas. Due to the presence of asbestos on site, the clean capping layer should consist of a minimum of 150mm topsoil overlying 850mm of subsoils for a total clean cover of 1000mm. Potentially, asbestos quantification analysis could be undertaken to reduce the depth of clean capping required should the asbestos concentration prove sufficiently low.

10.5.7 Where made ground is removed to the underlying natural strata, a reducing capping layer of 150mm topsoil and 150mm subsoil may be used to provide a minimum of 300mm growing medium to soft landscaped areas.

- 10.5.8 Should any further 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 As there is no available topsoil on site, suitable clean material should be imported to site to provide a suitable growing medium. The growing medium should consist of a minimum of 150mm topsoil overlying 150mm of subsoils. All material should be tested and certified prior to bringing to site to confirm it is free from contaminants.
- 10.5.10 If the imported material is from a Greenfield site, a minimum of 3 samples or 1 per 250m<sup>3</sup> 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 100m<sup>3</sup> 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 All 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 assessment on gas protection measures to be made.
- 11.2 Made ground on site to be relocated to enable a 1000mm clean capping layer to soft landscaped areas.
- 11.3 Asbestos quantification can be undertaken to reduce the depth of capping required should the concentration of asbestos prove sufficiently low.
- 11.4 Remediation of area to be piled on site to remove large obstructions.

## 12.0 APPROVALS

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

These include:

- a) Kirklees Council 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. Huddleston. MEng

Checked by



T. Haigh. BSc.,C.Eng.M.I.C.E.

August 2020

This report is subject to the provisions of the Copyright Acts and is for the sole benefit of Panorama Living in respect of the proposals described.

# **APPENDIX A**

**Site Location Plan**

**Dwg No. E20/7413/03 – Site Investigation Plan**

**Dwg No. E20/7413/32 - Typical Site Conceptual Model**



**Haigh Huddleston & Associates**

Civil Structural Engineering Consultants

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e Trevor.haigh@haighhuddleston.co.uk

Firth Building  
99-101 Leeds Road  
Dewsbury  
WF12 7BU

Client : Panorama Living

Job Title: Newsome Mills

Job Number : E19/7413

## LOCATION PLAN

OS Grid Reference : SE 143148

Easting : 414329

Northing : 414812

Topographical Survey carried out using  
GPS.

Postcode: HD4 6JF





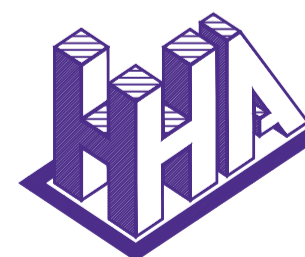
Trial Pit Location



Borehole Location



Window Sample Location



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Client

PANORAMA LIVING

Project

NEWSOME MILLS

Detail

TRIAL PIT LOCATION

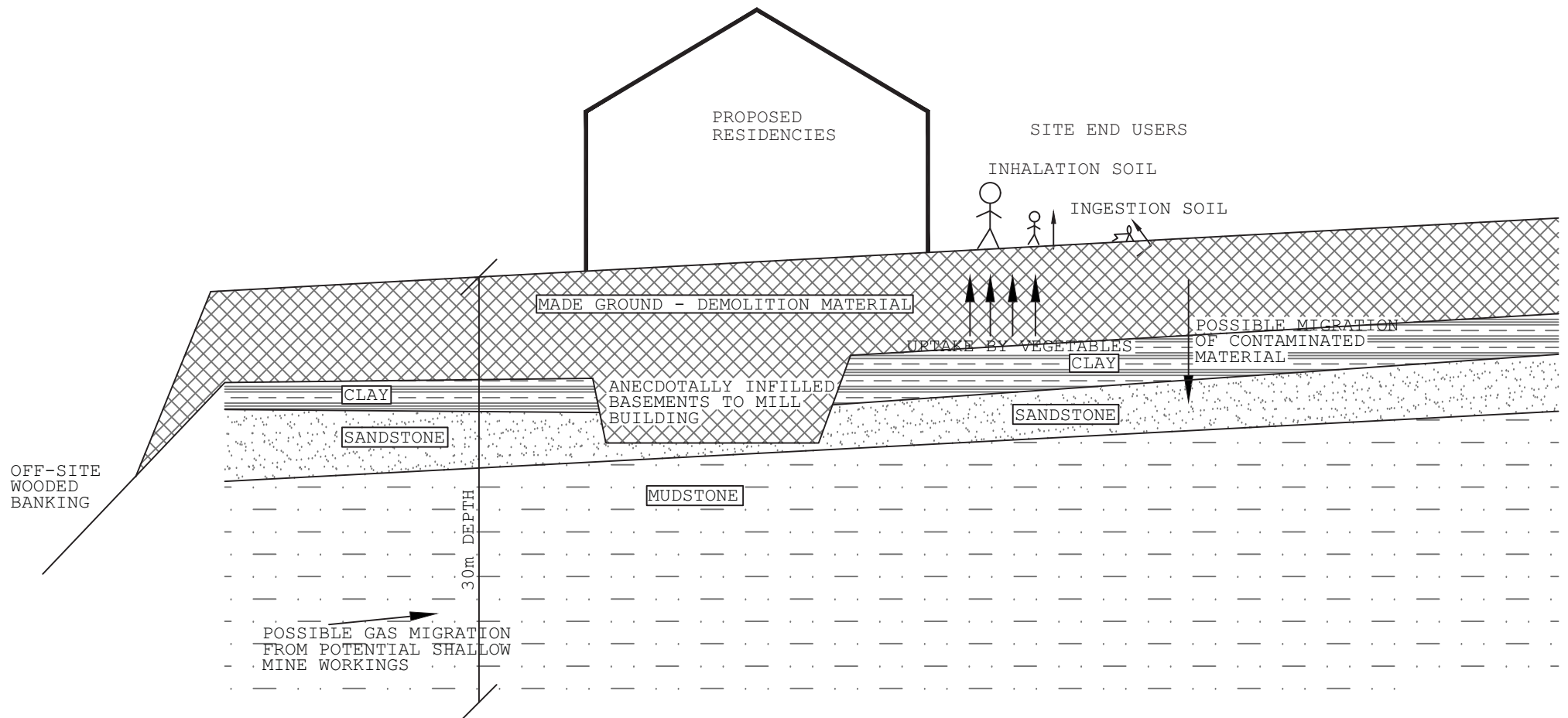
Dwn  
CM

Chkd  
MH

Date  
Jan2020

Scale  
1:500@A2

Dwg No.  
E19/7413/03



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Client

Panorama Living

Project

Newsome Mills, Ruth Street, Huddersfield

Detail

Typical Site Conceptual Model

Scale

NTS

Dwn

MD

Chkd

Date

Aug'20

Dwg No.

E20/7413/32

# APPENDI

Trial Hole Logs

Rotary Corehole Logs

Indo Sample Logs



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FORM HHA 5

## TRIAL HOLE NO. 1

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>RD</sup> FEBRUARY 2020</b>

0.0

0.5		
	0.9	
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

### REMARKS:

S O  
S ES  
S ES

### NOTES:

**Haigh Huddleston & Associates**

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FORM HHA 5

**TRIAL HOLE NO. 1a**

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>RD</sup> FEBRUARY 2020</b>
<b>0.0</b>			

	0.2	
0.5		
1.0		
	1.4	
1.5		
	1.7	D
2.0		
2.5		
3.0		
3.5		
4.0		

**REMARKS:**S  
SO  
O  
ES**NOTES:**



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FORM HHA 5

## TRIAL HOLE NO. 2

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>RD</sup> FEBRUARY 2020</b>

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### REMARKS:

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### NOTES:



**Haigh Huddleston & Associates**

Civil Structural Engineering Consultants

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

t 01924 464342

f 01924 450662

e trevor.haigh@haighhuddleston.co.uk

FORM HHA 5

## TRIAL HOLE NO. 3

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>RD</sup> FEBRUARY 2020</b>

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### NOTES:



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FORM HHA 5

## TRIAL HOLE NO. 4

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>RD</sup> FEBRUARY 2020</b>

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### NOTES:

**Haigh Huddleston & Associates**

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Dewsbury, WF12 7BUt 01924 464342  
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e trevor.haigh@haighhuddleston.co.uk

FORM HHA 5

**TRIAL HOLE NO. 5**

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>RD</sup> FEBRUARY 2020</b>

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FORM HHA 5

## TRIAL HOLE NO. 6

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>rd</sup> FEBRUARY 2020</b>

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### NOTES:

**Haigh Huddleston & Associates**

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FORM HHA 5

**TRIAL HOLE NO. 7**

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>rd</sup> FEBRUARY 2020</b>

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**Haigh Huddleston & Associates**

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e trevor.haigh@haighhuddleston.co.uk

FORM HHA 5

## TRIAL HOLE NO. 8

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>rd</sup> FEBRUARY 2020</b>

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### NOTES:

**Haigh Huddleston & Associates**

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e trevor.haigh@haighhuddleston.co.uk

FORM HHA 5

**TRIAL HOLE NO. 9**

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>rd</sup> FEBRUARY 2020</b>

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**REMARKS:**S  
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f 01924 450662

e trevor.haigh@haighhuddleston.co.uk

FORM HHA 5

**TRIAL HOLE NO. 10**

<b>Client :</b>	<b>PANORAMA LIVING</b>	<b>Job No :</b>	<b>7413</b>
<b>Site :</b>	<b>NEWSOME MILLS</b>	<b>Date :</b>	<b>3<sup>rd</sup> FEBRUARY 2020</b>
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**REMARKS:**S  
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# Ground Support Services (UK) LTD

Geotechnical and ground support foundation specialists

Unit D2B Bryans Close, Harworth Industrial Estate, Harworth, South Yorkshire, DN11 8RY

Phone: 01302 744 322 Email: thomas@groundsupportservices.co.uk

<b>Site Investigation Drillers log</b>			Site: <u>Hart street</u>			Sheet: <u>1 of 2</u>				
Rig: <u>Huthe</u>			Crew: <u>G Pilkington</u>			Date: <u>3-1-20</u>				
Hours on site:			Travelling Time:							
Equipment used:										
BH	Depth	Strata Description	BH	Depth	Strata Description					
1	000 - 1.70	made ground	2A	000 - 1.80	made ground					
	1.70 - 2.50	Clay		1.80 - 3.00	Sandstone brown					
	2.50 - 30.00	mudstone dark grey								
					Install 2.00 mt slotted pipe					
					1.00 mt plain pipe					
1A	000 - 1.70	made ground			Gravel 3.00 mt to 1.00 mt					
	1.70 - 2.50	Clay			Bentonite 1.00 mt to 0.00 mt					
	2.50 - 3.00	mudstone dark grey			1 end cap 1 gas tap					
					Concrete in 1 cover					
					Install 2.00 mt slotted pipe					
					1.00 mt plain pipe					
					Gravel 3.00 mt to 1.00 mt					
					Bentonite 1.00 mt to 0.00 mt					
					1 end cap 1 gas tap					
					Concrete in 1 cover					
2	000 - 1.80	made ground	3	000 - 0.60	made ground					
	1.80 - 4.30	Sandstone brown		0.60 - 1.70	Clay					
	4.30 - 30.00	mudstone dark grey		1.70 - 4.10	Sandstone brown					
				4.10 - 15.00	mudstone dark grey					
			4	000 - 4.10	made ground					
				4.10 - 15.00	mudstone dark grey					
			4A	000 - 3.00	made ground					
					Install 2.00 mt slotted pipe					
					1.00 mt plain pipe					
<b>Casing / Water level details</b>										
BH	Casing Die	Depth	Strike	Water Rise	Sealed	Totals	BH's	Drill	Case	Core
						Today				
						Previous				
						To date				

Signed [Signature] Driller

Ground Support Services (UK) LTD

**Geotechnical and ground support foundation specialists**

Unit D2B Bryans Close, Harworth Industrial Estate, Harworth, South Yorkshire, DN11 8RY

Phone: 01302 744 322 Email: [thomas@groundsupportservices.co.uk](mailto:thomas@groundsupportservices.co.uk)

[illegible]

Signed \_\_\_\_\_ Driller

# PM SAMPLING LOG SHEET

Tel: 07518 458787 Email: paddymalone2011@hotmail.co.uk

LOCATION: <u>Huddersfield</u>	RIG TYPE & No. <u>DART</u>	BOREHOLE NO: <u>WS1, WS2, WS3, WS4, WS5</u>
JOB No:	DRILLERS: <u>NATHAN</u>	BOREHOLE DIA:
CLIENT: <u>Hugh Huddleston</u>		CASING DIA:
DATE: <u>2-2-20</u>		SHEET No. <u>1 OF 2</u>

SAMPLES		U100		SPT - CPT BLOWS - 75mm										STRATA	DESCRIPTION		Piezometer Installation
DEPTH (M) FROM	TO	TYPE	BLOWS	LENGTH	S-C	75	75	LENGTH	75	75	75	75	LENGTH	DEPTH			
1M	1.45				5	1	2		4	5	5	7		6L-0.7	Ash made ground	WS1	
2M	2.45				5	9	9		10	16	17	7		0.7-1M	Sandy Firm Clay		
														1M-2M	Sandy Clay, mudstone		
1M	1.45				5	2	2		1	3	3	3		6L-0.8	made ground brick fill		
2M	2.45				5	6	5		7	8	9	12		0.8-2M	blew Sandy Clay		
2.8	3.25				5	15	10/25		17	20	13/50R			2M-2.8	Mudstone	WS2	
															install 2m slotted 0.8m plain		
1M	1.45				5	3	3		4	6	10	13		6L-0.5	Brick fill	WS3	
1.4	1.85				5	19	6/25		24	26	50R			0.5-1M	Light blew Sandy Clay		
														1M-1.4	Sandstone		
1M	1.45				5	1	2		2	4	4	5		6L-1M	made ground brick fill		
2M	2.45				5	4	4		10	20	20/50R			1M-2M	Sandy Clay		
														2.15-2.35	SANDSTONE	WS4	
															install 1 slotted 1 plain		
1M	1.45				5	5	5		6	7	9	10		6L-0.4	Brick fill		
1.5	1.95				5	13	11/25		17	17	16/50R			0.4-1M	Brown Sandy Clay, sandstone		
														1M-1.5	Sandy Clay sandstone		

WATER STRIKE				TRIAL PIT to 1.2M	GENERAL COMMENTS AND DELAYS	
DEPTH CASED				REINSTATEMENT <input checked="" type="checkbox"/>		
DEPTH SEALED				MOVEMENT IN WATER LEVEL		
				LEVEL IN (M) BGL		
				5 min		SIGNED: <u>NATHAN</u> PRINT NAME: <u>N SLATER</u>
				10 min		

WATER STRIKE				TRIAL PIT to 1.2M	GENERAL COMMENTS AND DELAYS			
				REINSTATEMENT <input checked="" type="checkbox"/>				
DEPTH CASED				MOVEMENT IN WATER LEVEL				
				LEVEL IN (M) BGL				
DEPTH SEALED				5 min				SIGNED: <u>NATHAN</u>
				10 min				

## APPENDI C

Chemical Analysis of Samples

Geotechnical Analysis of Samples



## Certificate of Analysis

*Certificate Number* 20-02426-1

18-Feb-20

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

*Our Reference* 20-02426-1

*Client Reference* 7413

*Order No* (not supplied)

*Contract Title* Newsome Mills

*Description* 9 Soil samples.

*Date Received* 06-Feb-20

*Date Started* 06-Feb-20

*Date Completed* 18-Feb-20

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

*Notes* **This report supersedes 20-02426, extra testing.**

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*

A handwritten signature in black ink, appearing to read "A. Fenwick", is written over a light grey circular background.

Adam Fenwick  
Contracts Manager





## Summary of Chemical Analysis

### Matrix Descriptions

*Our Ref* 20-02426-1

*Client Ref* 7413

*Contract Title* Newsome Mills

Sample ID	Depth	Lab No	Completed	Matrix Description
TP01	0.3	1634369	12/02/2020	Dark brown gravelly, sandy CLAY (Possible made ground - brick)
TP02	0.6	1634370	12/02/2020	Dark brown gravelly, sandy CLAY
TP03	0.9	1634371	12/02/2020	Dark brown gravelly, sandy CLAY including some wood
TP04	1.2	1634372	12/02/2020	Brown gravelly, sandy CLAY
TP05	1	1634373	12/02/2020	Brown gravelly, sandy CLAY
TP06	0.5	1634374	12/02/2020	Dark brown gravelly, sandy CLAY
TP07	0.3	1634375	12/02/2020	Dark brown gravelly, sandy CLAY including odd rootlets (Possible made ground - glass,brick)
TP07	1.4	1634376	12/02/2020	Dark brown gravelly, sandy CLAY including odd rootlets (Possible made ground - glass)
TP08	0.2	1634377	12/02/2020	Dark brown gravelly, sandy CLAY (Possible made ground - brick)

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-02426-1

Client Ref 7413

Contract Title Newsome Mills

Lab No	1634369	1634370	1634371	1634372	1634373	1634374
Sample ID	TP01	TP02	TP03	TP04	TP05	TP06
Depth	0.30	0.60	0.90	1.20	1.00	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/02/2020	03/02/2020	03/02/2020	03/02/2020	03/02/2020	03/02/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETS 2301#	0.2	mg/kg	12	15	11	12	5.7	18
Cadmium	DETS 2301#	0.1	mg/kg	1.0	1.2	0.6	0.2	0.2	1.4
Chromium	DETS 2301#	0.15	mg/kg	26	22	20	23	21	39
Copper	DETS 2301#	0.2	mg/kg	40	57	47	38	34	58
Lead	DETS 2301#	0.3	mg/kg	85	130	140	63	32	140
Mercury	DETS 2325#	0.05	mg/kg	0.06	0.78	0.18	0.11	0.06	0.26
Nickel	DETS 2301#	1	mg/kg	21	17	16	18	17	25
Selenium	DETS 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETS 2301#	1	mg/kg	130	110	140	65	57	200
<b>Inorganics</b>									
pH	DETS 2008#		pH	8.9	8.4	11.8	6.9	8.8	8.1
Thiocyanate	DETS 2130#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Sulphide	DETS 2024*	10	mg/kg	76	60	92	< 10	< 10	76
Sulphate as SO <sub>4</sub> , Total	DETS 2321#	0.01	%	0.11	0.17	0.35	0.10	0.03	0.11
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETS 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETS 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETS 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETS 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETS 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETS 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETS 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETS 3072*	10	mg/kg						
Aromatic C5-C7	DETS 3321*	0.01	mg/kg						
Aromatic C7-C8	DETS 3321*	0.01	mg/kg						
Aromatic C8-C10	DETS 3321*	0.01	mg/kg						
Aromatic C10-C12	DETS 3072#	0.9	mg/kg						
Aromatic C12-C16	DETS 3072#	0.5	mg/kg						
Aromatic C16-C21	DETS 3072#	0.6	mg/kg						
Aromatic C21-C35	DETS 3072#	1.4	mg/kg						
Aromatic C5-C35	DETS 3072*	10	mg/kg						
TPH Ali/Aro Total	DETS 3072*	10	mg/kg						
EPH (C10-C40)	DETS 3311#	10	mg/kg						
<b>PAHs</b>									
Naphthalene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETS 3301	0.1	mg/kg	0.3	0.5	0.2	< 0.1	< 0.1	0.2
Anthracene	DETS 3301	0.1	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETS 3301	0.1	mg/kg	0.7	0.9	0.3	< 0.1	< 0.1	0.1
Pyrene	DETS 3301	0.1	mg/kg	0.7	0.8	0.3	< 0.1	< 0.1	< 0.1

## Summary of Chemical Analysis Soil Samples

Our Ref 20-02426-1

Client Ref 7413

Contract Title Newsome Mills

Lab No	1634369	1634370	1634371	1634372	1634373	1634374
Sample ID	TP01	TP02	TP03	TP04	TP05	TP06
Depth	0.30	0.60	0.90	1.20	1.00	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/02/2020	03/02/2020	03/02/2020	03/02/2020	03/02/2020	03/02/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.3	0.4	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.4	0.4	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.5	0.4	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2	0.2	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.5	0.4	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 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	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	3.9	4.7	< 1.6	< 1.6	< 1.6	< 1.6
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

## Summary of Chemical Analysis

### Soil Samples

Our Ref 20-02426-1

Client Ref 7413

Contract Title Newsome Mills

Lab No	1634375	1634376	1634377
Sample ID	TP07	TP07	TP08
Depth	0.30	1.40	0.20
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	03/02/2020	03/02/2020	03/02/2020
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>Metals</b>						
Arsenic	DETS 2301#	0.2	mg/kg	14	15	8.9
Cadmium	DETS 2301#	0.1	mg/kg	1.1	3.4	0.4
Chromium	DETS 2301#	0.15	mg/kg	26	46	18
Copper	DETS 2301#	0.2	mg/kg	76	110	66
Lead	DETS 2301#	0.3	mg/kg	300	370	350
Mercury	DETS 2325#	0.05	mg/kg	0.19	0.65	0.09
Nickel	DETS 2301#	1	mg/kg	19	34	16
Selenium	DETS 2301#	0.5	mg/kg	< 0.5	0.5	< 0.5
Zinc	DETS 2301#	1	mg/kg	200	390	220
<b>Inorganics</b>						
pH	DETS 2008#		pH	10.3	9.3	9.0
Thiocyanate	DETS 2130#	0.6	mg/kg	< 0.6	< 0.6	0.7
Sulphide	DETS 2024*	10	mg/kg	100	88	84
Sulphate as SO <sub>4</sub> , Total	DETS 2321#	0.01	%	0.23	0.21	0.14
<b>Petroleum Hydrocarbons</b>						
Aliphatic C5-C6	DETS 3321*	0.01	mg/kg		< 0.01	
Aliphatic C6-C8	DETS 3321*	0.01	mg/kg		< 0.01	
Aliphatic C8-C10	DETS 3321*	0.01	mg/kg		< 0.01	
Aliphatic C10-C12	DETS 3072#	1.5	mg/kg		< 1.5	
Aliphatic C12-C16	DETS 3072#	1.2	mg/kg		14	
Aliphatic C16-C21	DETS 3072#	1.5	mg/kg		88	
Aliphatic C21-C35	DETS 3072#	3.4	mg/kg		1300	
Aliphatic C5-C35	DETS 3072*	10	mg/kg		1400	
Aromatic C5-C7	DETS 3321*	0.01	mg/kg		< 0.01	
Aromatic C7-C8	DETS 3321*	0.01	mg/kg		< 0.01	
Aromatic C8-C10	DETS 3321*	0.01	mg/kg		< 0.01	
Aromatic C10-C12	DETS 3072#	0.9	mg/kg		< 0.9	
Aromatic C12-C16	DETS 3072#	0.5	mg/kg		9.9	
Aromatic C16-C21	DETS 3072#	0.6	mg/kg		110	
Aromatic C21-C35	DETS 3072#	1.4	mg/kg		1200	
Aromatic C5-C35	DETS 3072*	10	mg/kg		1300	
TPH Ali/Aro Total	DETS 3072*	10	mg/kg		2700	
EPH (C10-C40)	DETS 3311#	10	mg/kg	< 10	5400	130
<b>PAHs</b>						
Naphthalene	DETS 3301	0.1	mg/kg	< 0.1	0.4	< 0.1
Acenaphthylene	DETS 3301	0.1	mg/kg	< 0.1	0.4	< 0.1
Acenaphthene	DETS 3301	0.1	mg/kg	0.1	1.0	< 0.1
Fluorene	DETS 3301	0.1	mg/kg	< 0.1	0.2	< 0.1
Phenanthrene	DETS 3301	0.1	mg/kg	0.9	1.5	< 0.1
Anthracene	DETS 3301	0.1	mg/kg	0.2	0.4	< 0.1
Fluoranthene	DETS 3301	0.1	mg/kg	1.1	2.0	0.2
Pyrene	DETS 3301	0.1	mg/kg	1.0	2.7	0.2

## Summary of Chemical Analysis

### Soil Samples

Our Ref 20-02426-1

Client Ref 7413

Contract Title Newsome Mills

Lab No	1634375	1634376	1634377
Sample ID	TP07	TP07	TP08
Depth	0.30	1.40	0.20
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	03/02/2020	03/02/2020	03/02/2020
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.6	1.0	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.5	1.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.4	6.2	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2	2.0	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.5	5.2	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.2	1.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.8	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.4	0.7	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	6.3	26	< 1.6
<b>Phenols</b>						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

## Summary of Asbestos Analysis Soil Samples

*Our Ref* 20-02426-1

*Client Ref* 7413

*Contract Title* Newsome Mills

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1634369	TP01 0.30	SOIL	Amosite	Amosite present as bundles	Joanne Luscombe
1634370	TP02 0.60	SOIL	Chrysotile	small bundles of Chrysotile present	Joanne Luscombe
1634371	TP03 0.90	SOIL	Chrysotile Amosite	Amosite and Chrysotile present as fibre bundles	Joanne Luscombe
1634372	TP04 1.20	SOIL	NAD	none	Joanne Luscombe
1634373	TP05 1.00	SOIL	NAD	none	Joanne Luscombe
1634374	TP06 0.50	SOIL	NAD	none	Joanne Luscombe
1634375	TP07 0.30	SOIL	Chrysotile	Chrysotile present in microscopic loose fibrous asbestos debris	Joanne Luscombe
1634376	TP07 1.40	SOIL	Chrysotile	Chrysotile present as fibrous bundles	Joanne Luscombe
1634377	TP08 0.20	SOIL	Amosite	Amosite present in microscopic loose fibrous asbestos debris	Joanne Luscombe

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 20-02426-1  
 Client Ref 7413  
 Contract Newsome Mills

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
1634369	TP01 0.30 SOIL	03/02/20	GJ 250ml, PT 1L		
1634370	TP02 0.60 SOIL	03/02/20	GJ 250ml, PT 1L		
1634371	TP03 0.90 SOIL	03/02/20	GJ 250ml, PT 1L		
1634372	TP04 1.20 SOIL	03/02/20	GJ 250ml, PT 1L		
1634373	TP05 1.00 SOIL	03/02/20	GJ 250ml, PT 1L		
1634374	TP06 0.50 SOIL	03/02/20	GJ 250ml, PT 1L		
1634375	TP07 0.30 SOIL	03/02/20	GJ 250ml, PT 1L		
1634376	TP07 1.40 SOIL	03/02/20	GJ 250ml, PT 1L		
1634377	TP08 0.20 SOIL	03/02/20	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 <sub>4</sub>	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 <sub>4</sub>	%	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.



**STRUCTURAL SOILS LTD**  
**TEST REPORT**



Report No. 784350 R1

1774

Date 20-February-2020 Contract Newsome Mills

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

For the Attention of Martin Huddleston

Samples submitted by client 05/02/2020  
Testing Started 06/02/2020  
Testing Completed 20/02/2020

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
TP09		D	1.50	31	60	26	34	99	Light brown grey slightly sandy slightly gravelly CLAY



STRUCTURAL  
SOILS LTD

Contract:

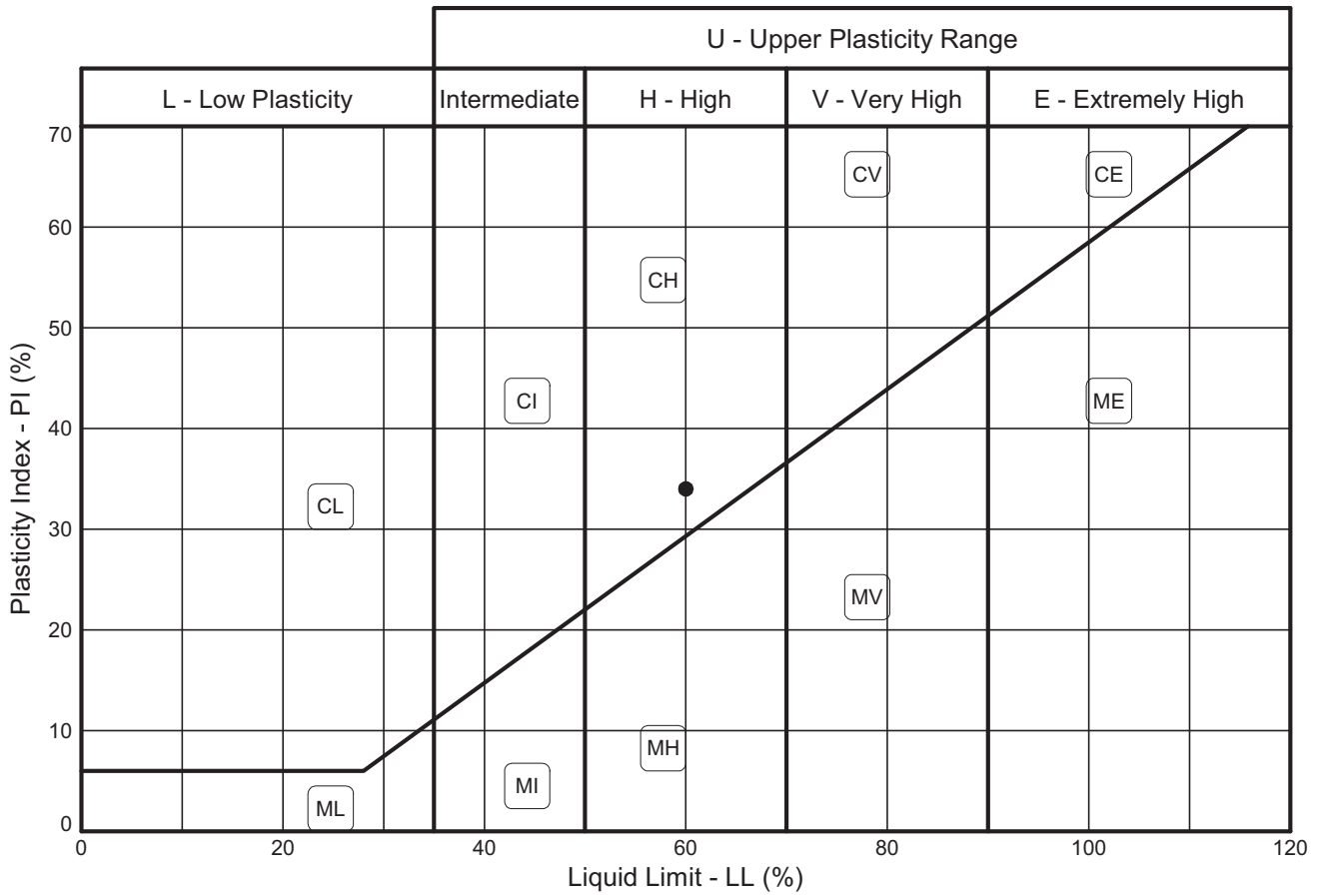
Newsome Mills

Contract Ref:

784350



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

[illegible]

# 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

Date

LORNA WHITWORTH

Contract

## Newsome Mills

Contract Ref:
---------------

**784350**



# 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: **20/02/2020 14:22:22**.

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  
WF10 1NJ

Hemel Laboratory  
18 Frogmore Road  
Hemel Hempstead  
Hertfordshire  
HP3 9RT

Tonbridge Laboratory  
Anerley Court, Half Moon Lane  
Hildenborough  
Tonbridge  
TN11 9HU



**STRUCTURAL  
SOILS LTD**

Contract:

**Newsome Mills**

Job No:

**784350**



# **APPENDI D**

**Coal Authority Report**

**Geology Report**

# CON29M Non-Residential Mining Report

NEWSOME MILLS  
RUTH STREET/HART STREET  
NEWSOME  
HUDDERSFIELD  
KIRKLEES  
HD4 6JF

Date of enquiry: 29 November 2018  
Date enquiry received: 29 November 2018  
Issue date: 29 November 2018

Our reference: 51001975914001  
Your reference: PANORAMA LIVING 7413



# CON29M Non-Residential Mining Report

This report is based on, and limited to, the records held by the Coal Authority, at the time we answer the search.

## Client name

HAIGH HUDDLESTON & ASSOCIATES

## Enquiry address




NEWSOME MILLS, RUTH STREET/HART STREET,  
NEWSOME, HUDDERSFIELD, KIRKLEES, HD4 6JF

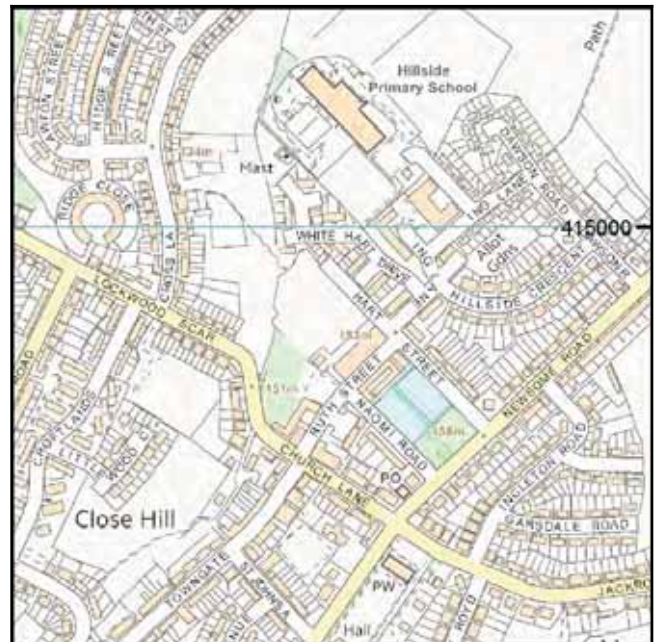
## How to contact us

0345 762 6848 (UK)  
+44 (0)1623 637 000 (International)

200 Lichfield Lane  
Mansfield  
Nottinghamshire  
NG18 4RG

[www.groundstability.com](http://www.groundstability.com)

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



Approximate position of property



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# Summary

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

**For detailed findings, please go to page 4.**

# Detailed findings

## 1. Past underground coal mining

The property is in a surface area that could be affected by underground mining in 1 seam of coal at 60m to 70m depth, and last worked in 1911.

Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

In addition 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 Comments on the Coal Authority information section 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 known coal mine entries within, or within 20 metres of, the boundary of the property.

There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.

## **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.

# Comments on the Coal Authority information

The Coal Authority own the copyright in this report and the information used is protected by our database right.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore 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 good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

A site investigation was carried out in January 2007 by Manchester Geotechnical Ltd., Coal Pit Lane, Atherton, Manchester, M46 0FY on behalf of Royale Estates, Warwick House, Warwick Street, Manchester M16 0QQ.

## Additional remarks

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. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

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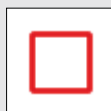
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If you would like this report in an alternative format, please contact our communications team.

# Enquiry boundary

## Key

Approximate position of enquiry boundary shown




## How to contact us


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

Groundsure Reference: GS-5658352  
Your Reference: PANORAMA\_LIVING\_7413  
Report Date: 29 Nov 2018  
Report Delivery Method: Email - pdf

## Geo Insight

Address: RUTH STREET, NEWSOME, HUDDERSFIELD, HD4 6JF

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,

A handwritten signature in black ink, appearing to be "J. O.", followed by a period.

Managing Director  
Groundsure Limited

Enc.  
Groundsure Geo Insight

Address: RUTH STREET, NEWSOME, HUDDERSFIELD, HD4 6JF

Date: 29 Nov 2018

Reference: GS-5658352

Client: Haigh Huddleston & Associates



Aerial Photograph Capture date: 26-Mar-2012

Grid Reference: 414342,414885

Site Size: 1.13ha

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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 landslip 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 landslip 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

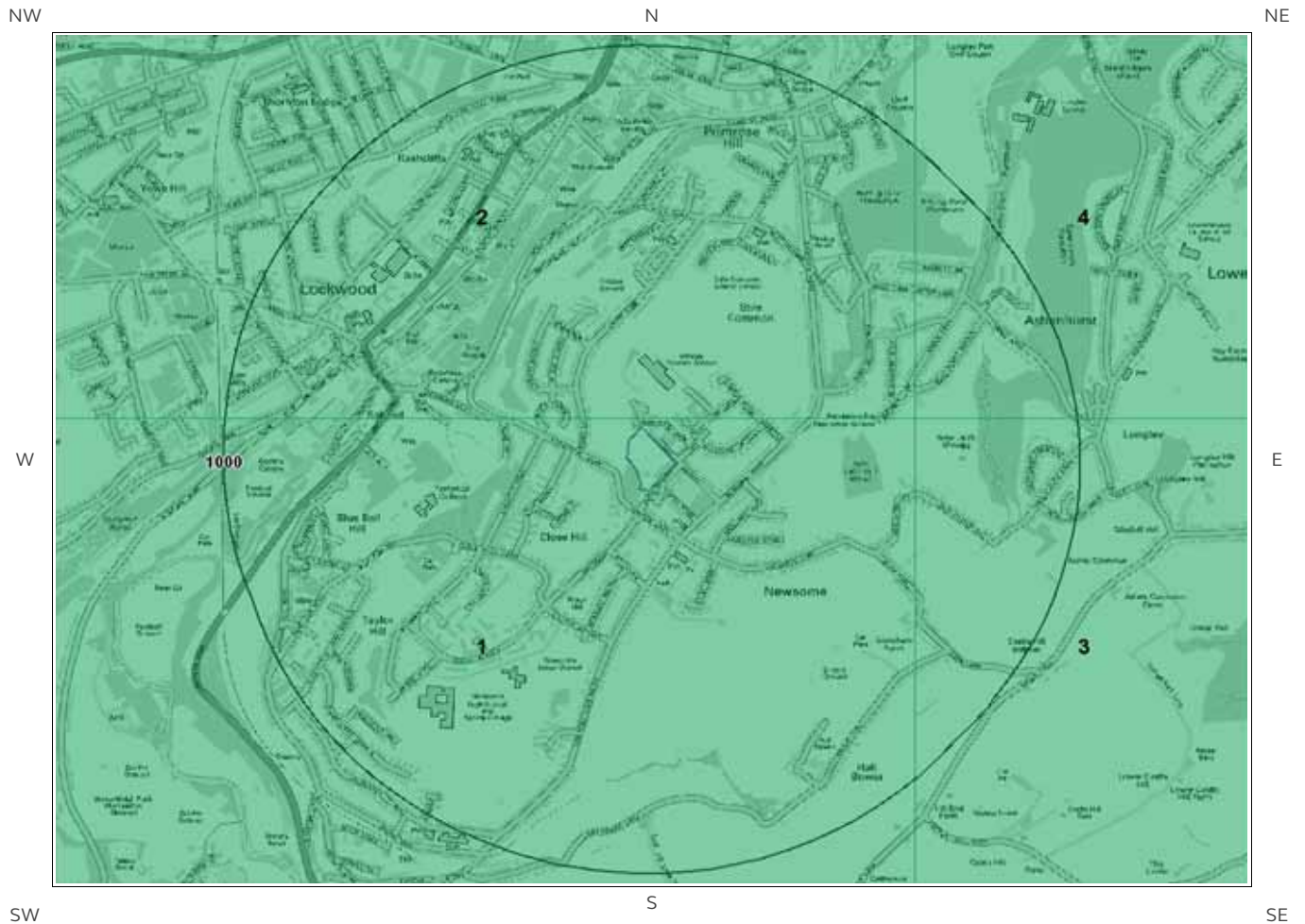
	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	6	0	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	2	2
4.3 Current Ground Workings	0	0	0	5	6

## Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	2	2
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	2
5.5 Non-Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	1

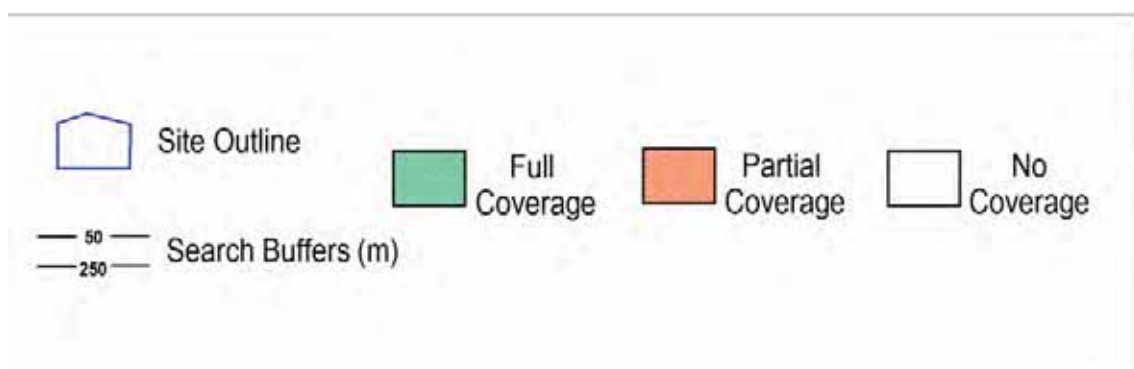
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Very Low				
6.2 Landslides	Moderate				
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	0	21		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	2	2	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	0	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	0	0	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	23.0	Some deposits are mapped	Full	Full	Some deposits are mapped
3	587.0	Some deposits are mapped	Full	Full	Some deposits are mapped
4	599.0	Some deposits are mapped	Full	Full	Some deposits are mapped

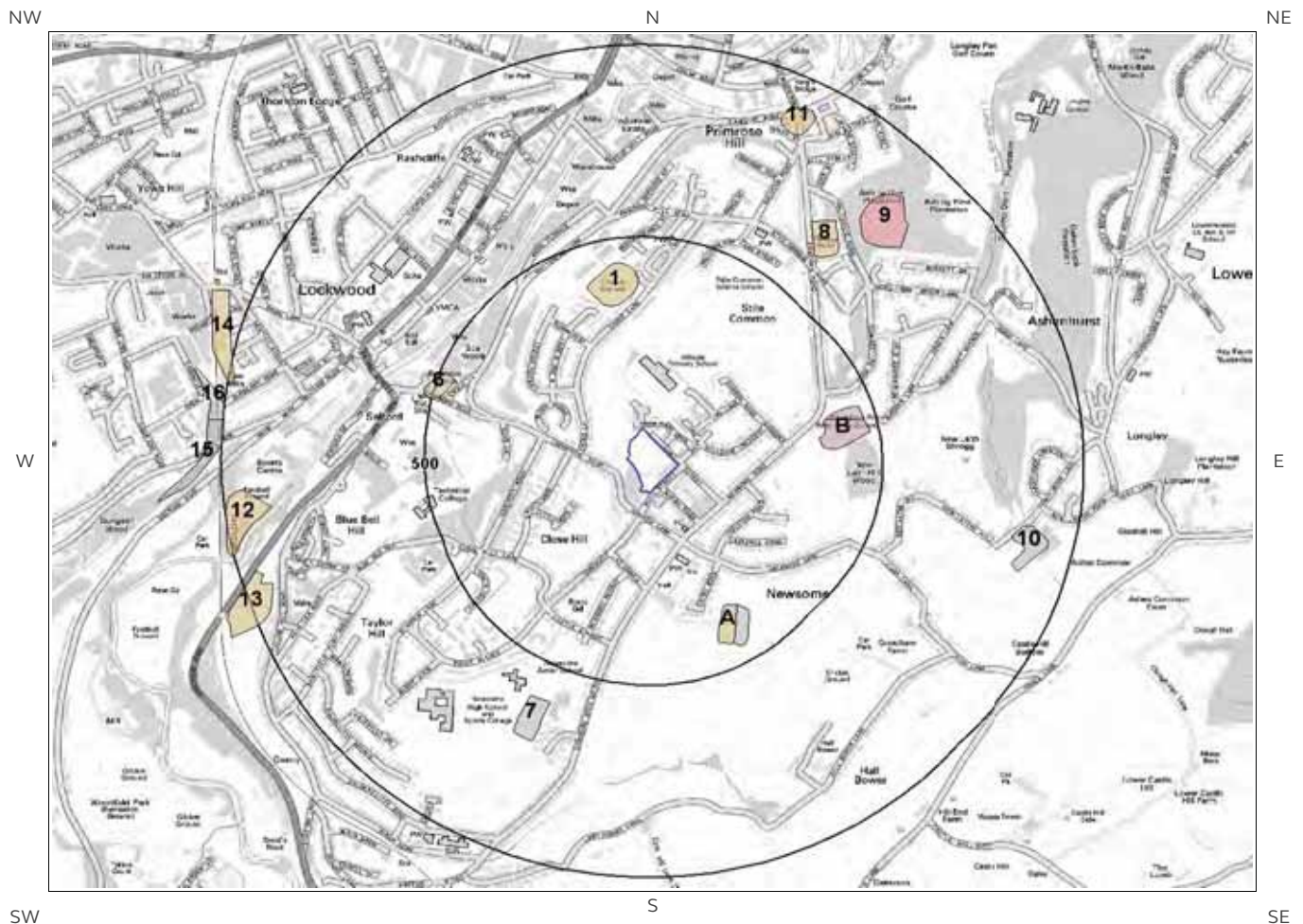
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not 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

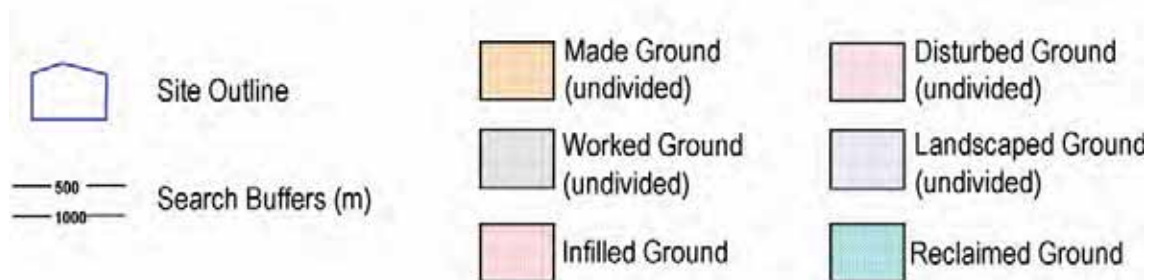
# 1 Geology (1:10,000 scale).

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



Artificial Ground Legend

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# 1. Geology 1:10,000 scale

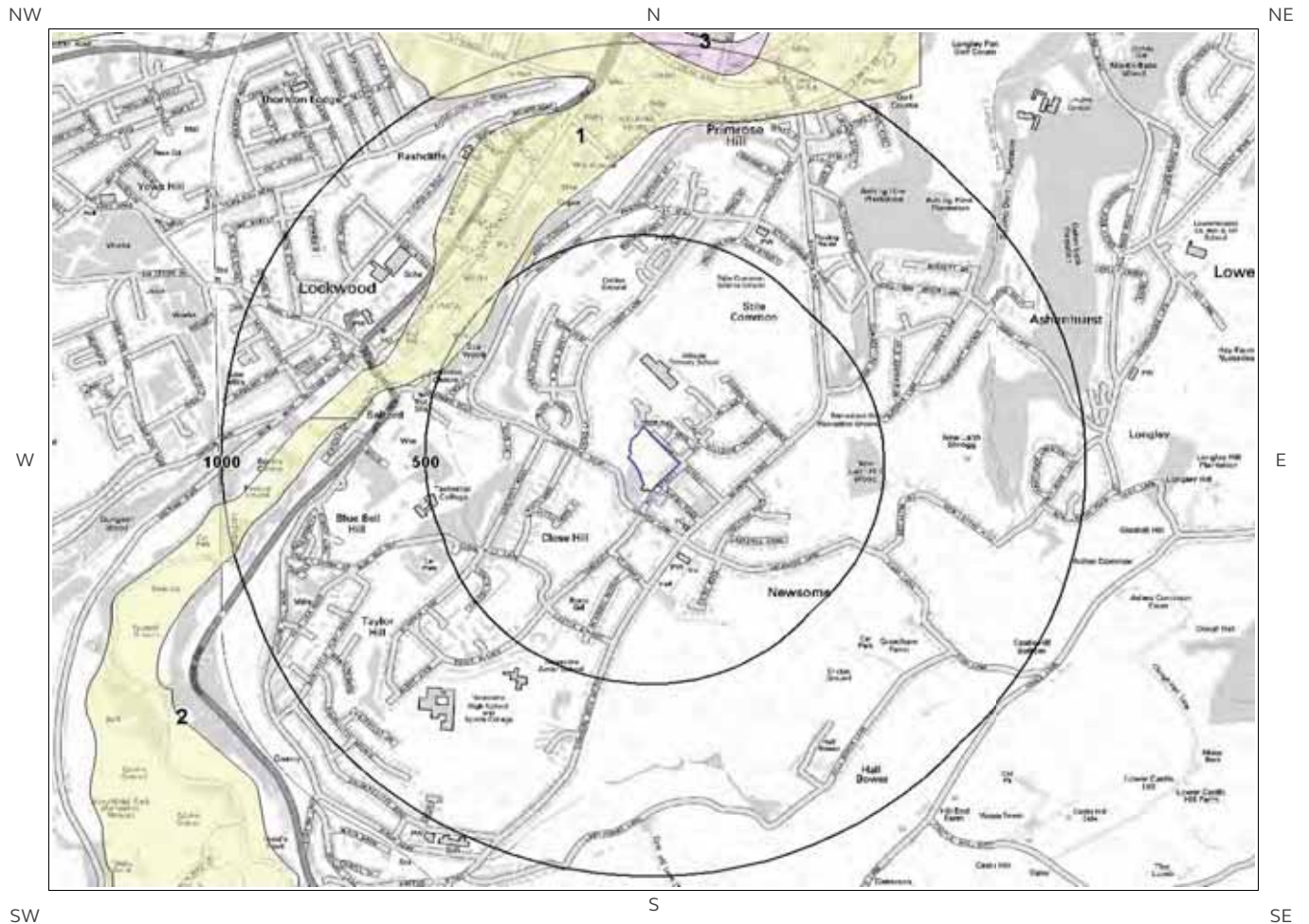
## 1.1 Artificial Ground

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

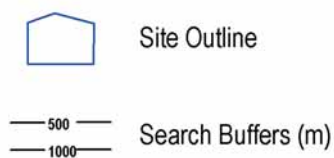
ID	Distance	Direction	LEX Code	Description	Rock Description
1	328.0	N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2A	345.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3B	349.0	E	WMGR-ARTDP	Infilled Ground	Artificial Deposit
4A	360.0	SE	WGR-VOID	Worked Ground (Undivided)	Void
5B	375.0	E	WMGR-ARTDP	Infilled Ground	Artificial Deposit
6	461.0	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? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	466.0	NW	ALV-XCSV	Alluvium - Clay, Sand And Gravel	Clay, Sand And Gravel

## 1.2.2 Landslip

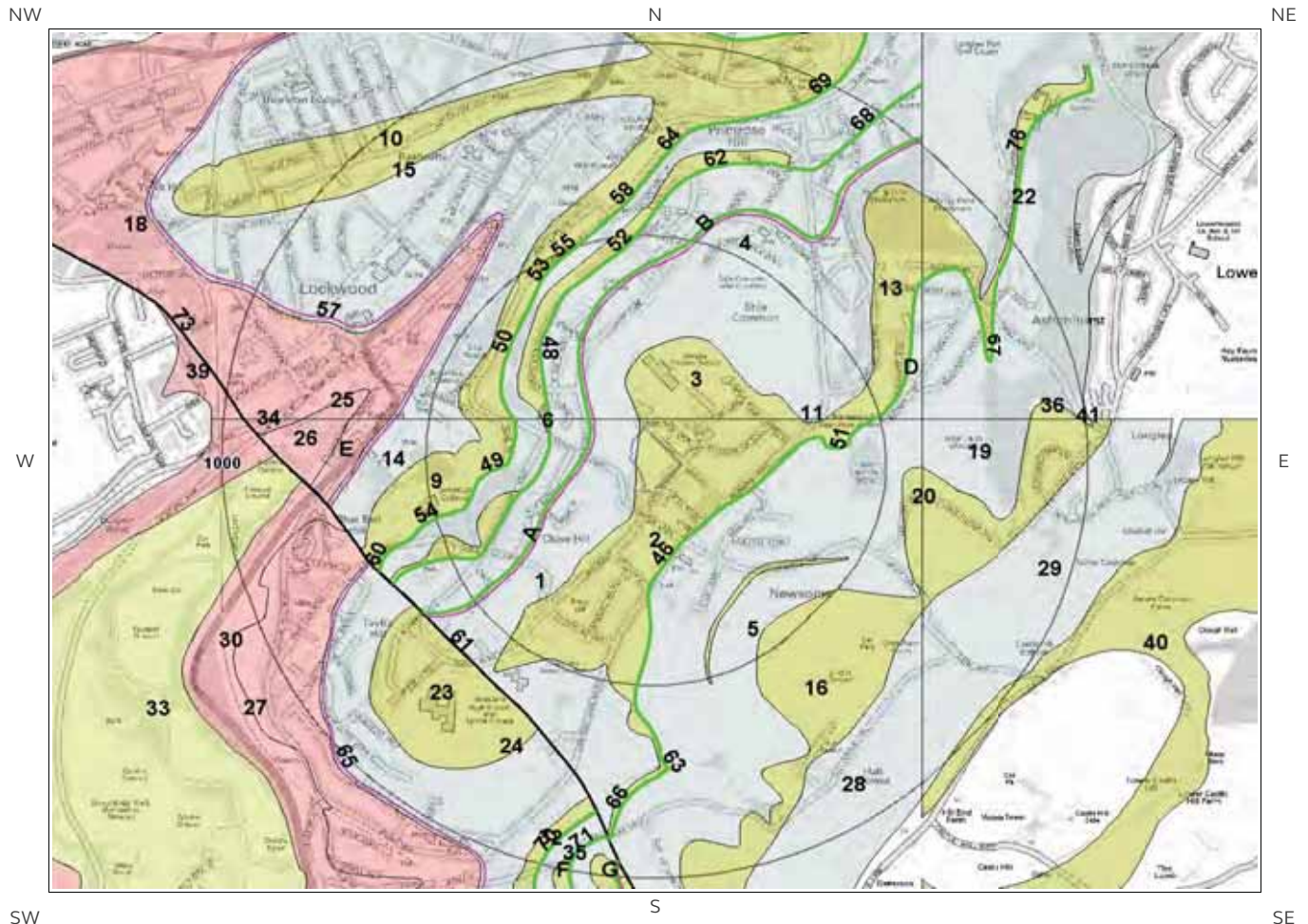
Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

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

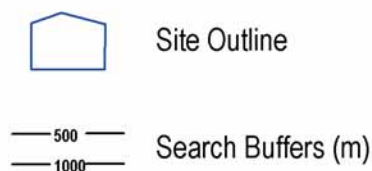
This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

# 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	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
2	0.0	On Site	STNR-SDST	Stanningley Rock - Sandstone	Langsettian Sub-age
3	23.0	N	STNR-SDST	Stanningley Rock - Sandstone	Langsettian Sub-age
4	28.0	NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
5	142.0	SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
6	200.0	W	MBR-SDST	Middle Band Rock - Sandstone	Langsettian Sub-age
7	211.0	W	MBR-SDST	Middle Band Rock - Sandstone	Langsettian Sub-age
8C	281.0	W	MBR-SDST	Middle Band Rock - Sandstone	Langsettian Sub-age
9	286.0	W	SBF-SDST	Soft Bed Flags - Sandstone	Langsettian Sub-age
10	296.0	W	SBF-SDST	Soft Bed Flags - Sandstone	Langsettian Sub-age
11	314.0	E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
12	317.0	SE	FEYR-SDST	48 Yard Rock - Sandstone	Langsettian Sub-age
13	365.0	E	STNR-SDST	Stanningley Rock - Sandstone	Langsettian Sub-age
14	368.0	W	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
15	407.0	W	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
16	444.0	SE	EYR-SDST	80 Yard Rock - Sandstone	Langsettian Sub-age
17D	487.0	E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And 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
42A	93.0	W	FOSSIL_HORIZON	Fossil horizon, marine band
43A	104.0	W	ROCK	Coal seam, inferred
44B	108.0	NW	FOSSIL_HORIZON	Fossil horizon, marine band
45B	117.0	NW	ROCK	Coal seam, inferred
46	142.0	SE	ROCK	Coal seam, inferred
47C	200.0	W	ROCK	Coal seam, inferred

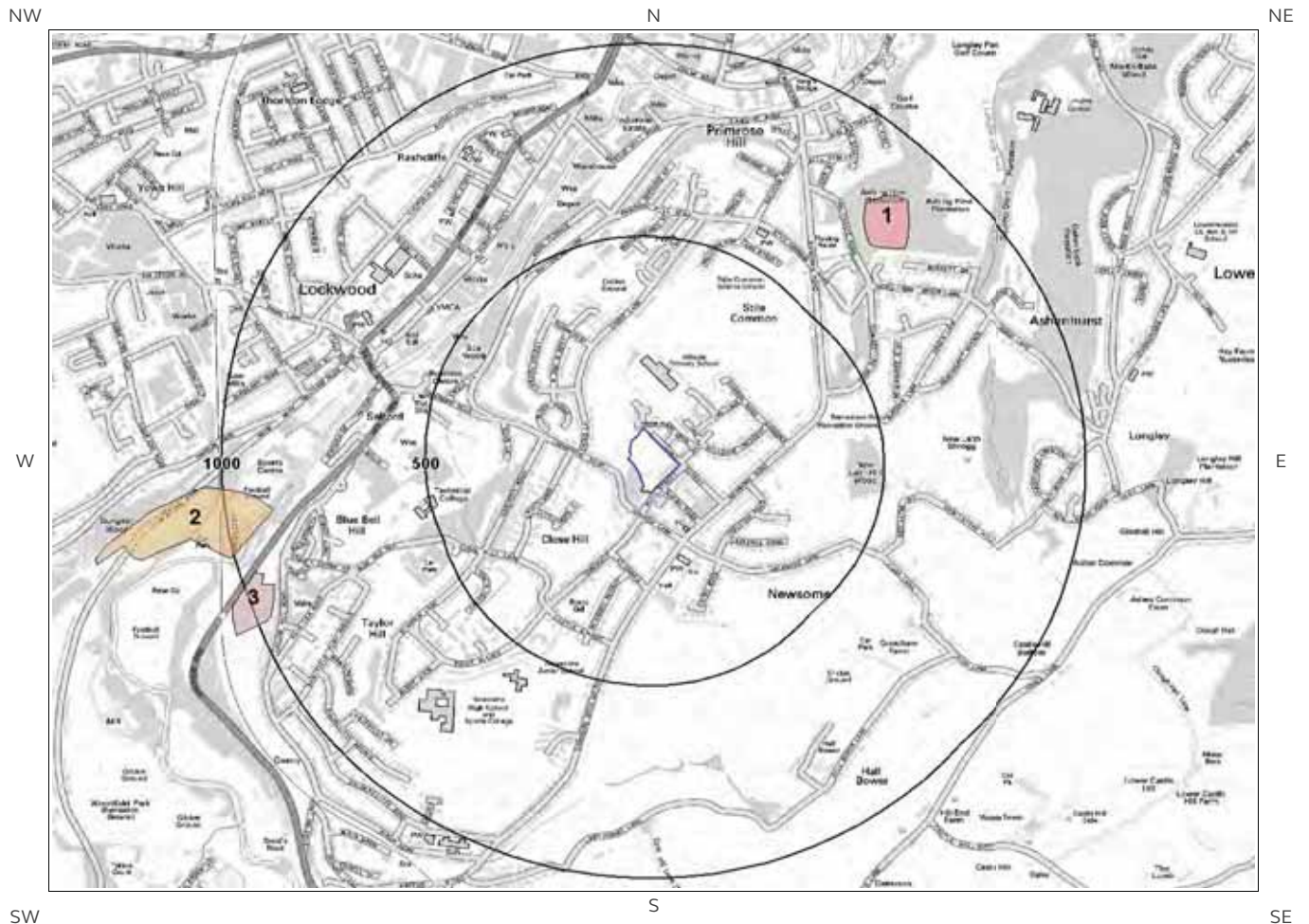
ID	Distance (m)	Direction	Category Description	Feature Description
48	211.0	W	ROCK	Coal seam, observed
49	286.0	W	ROCK	Coal seam, inferred
50	296.0	W	ROCK	Coal seam, observed
51	342.0	E	ROCK	Coal seam, observed
52	413.0	N	ROCK	Coal seam, inferred
53	450.0	NW	ROCK	Coal seam, inferred
54	461.0	W	ROCK	Coal seam, observed
55	480.0	NW	ROCK	Coal seam, observed
56D	487.0	E	ROCK	Coal seam, inferred

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

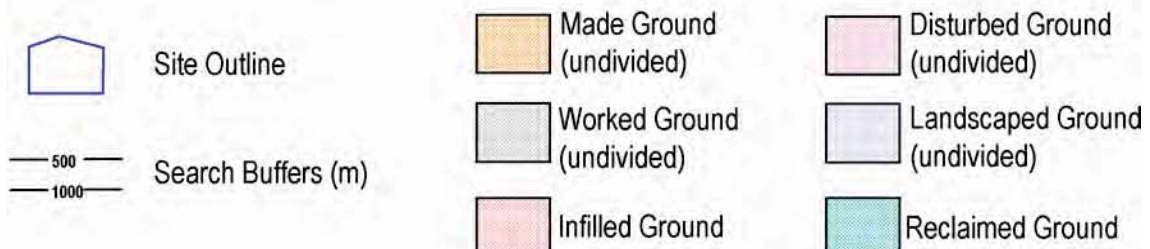
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

# 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: 077

#### 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.

---

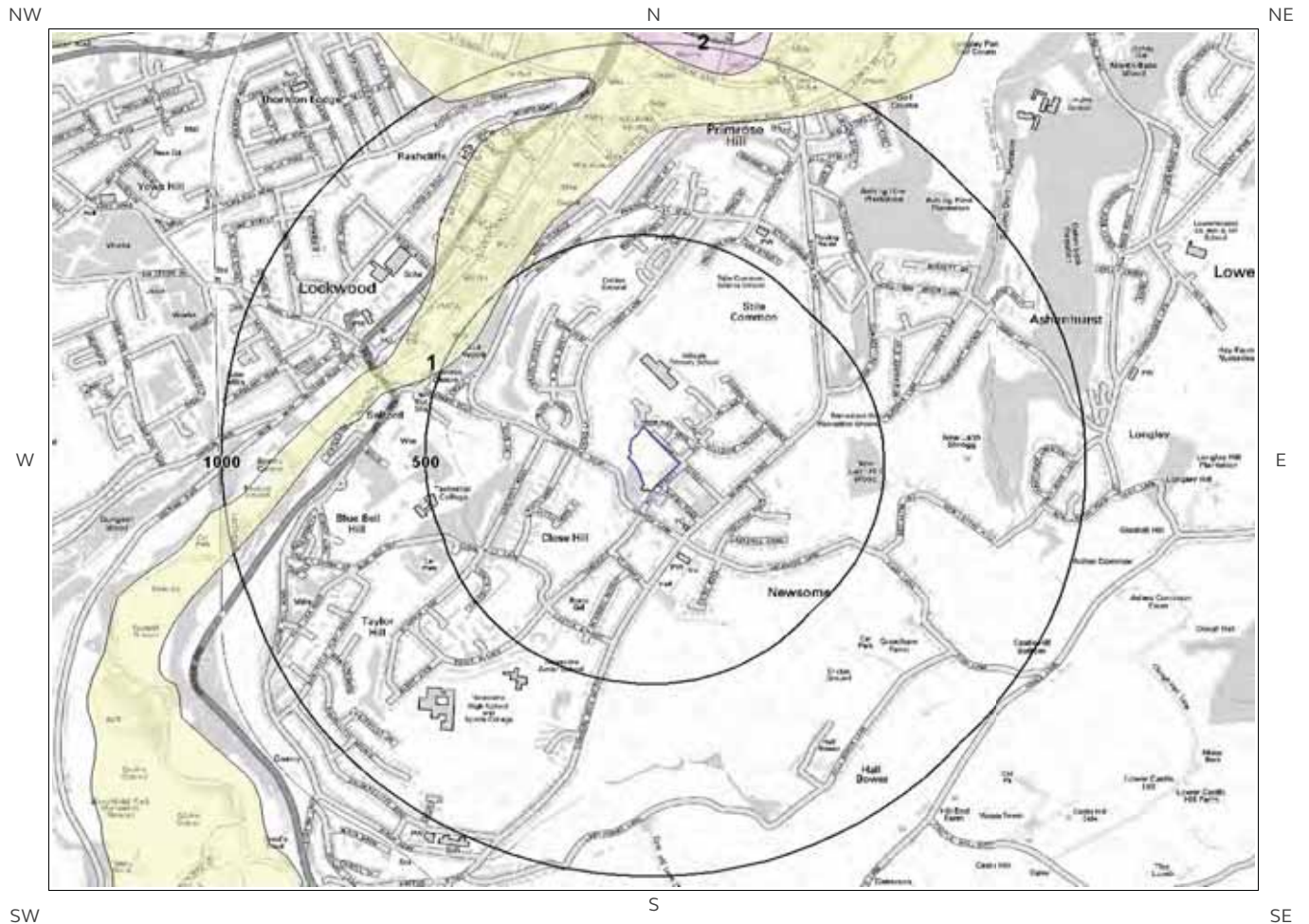
#### 2.1.2 Permeability of Artificial Ground

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

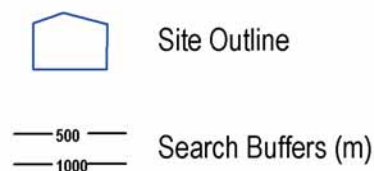
Database searched and no data found.

---

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



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## 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? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	460.0	NW	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

---

### 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.

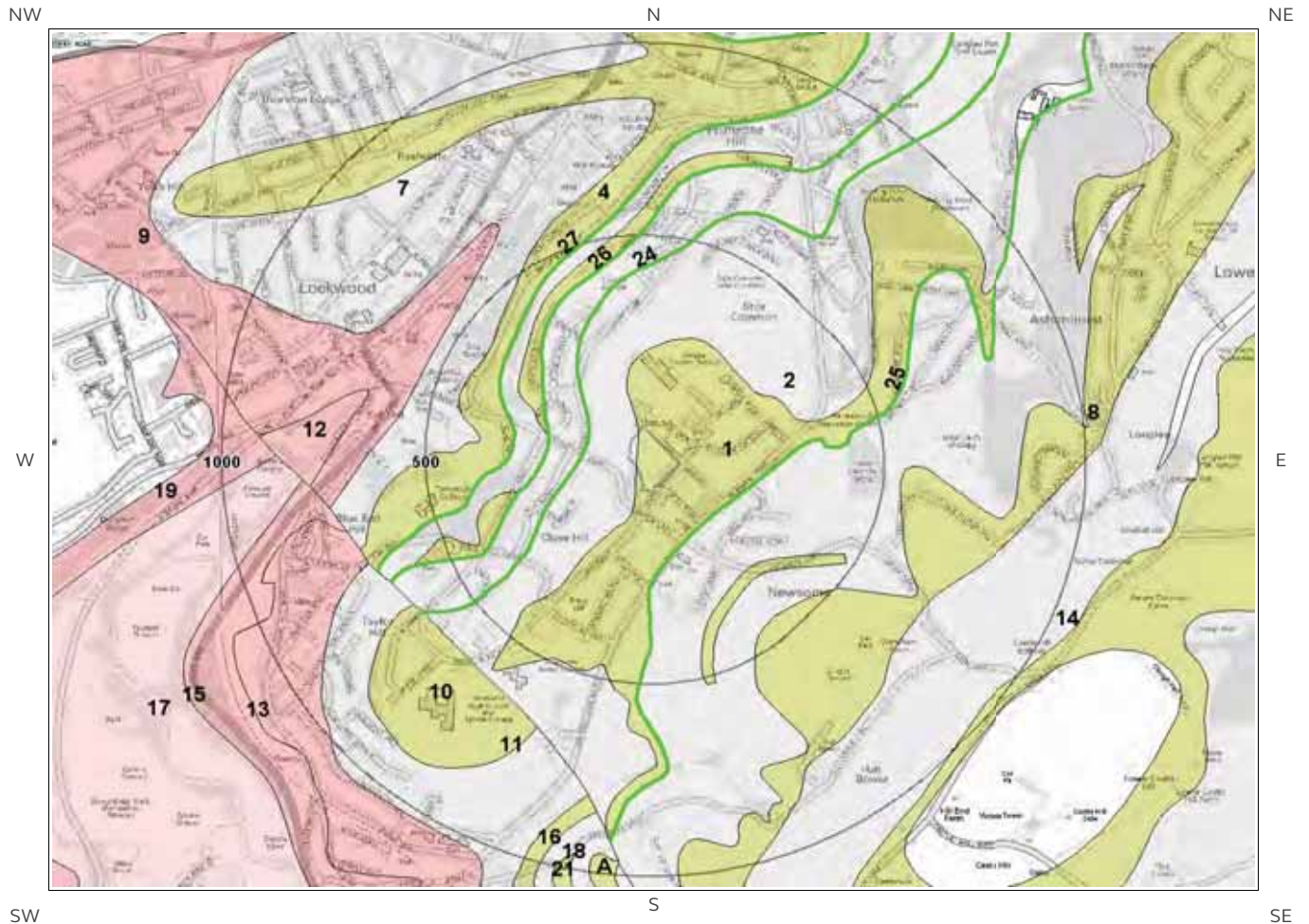
---

### 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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## 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: 077

### 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	STNR-SDST	STANNINGLEY ROCK - SANDSTONE	WESTPHALIAN
2	0.0	On Site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
3	199.0	W	MBR-SDST	MIDDLE BAND ROCK - SANDSTONE	WESTPHALIAN
4	285.0	W	SBF-SDST	SOFT BED FLAGS - SANDSTONE	WESTPHALIAN
5	285.0	W	MBR-SDST	MIDDLE BAND ROCK - SANDSTONE	WESTPHALIAN
6	307.0	SE	FEYR-SDST	48 YARD ROCK - SANDSTONE	WESTPHALIAN
7	367.0	W	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
8	443.0	SE	EYR-SDST	80 YARD ROCK - 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	Low
23.0	N	Fracture	High	Moderate
29.0	NW	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
24	105.0	W	ROCK	Coal seam, inferred
25	148.0	SE	ROCK	Coal seam, inferred
26	199.0	W	ROCK	Coal seam, inferred
27	285.0	W	ROCK	Coal seam, inferred

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

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

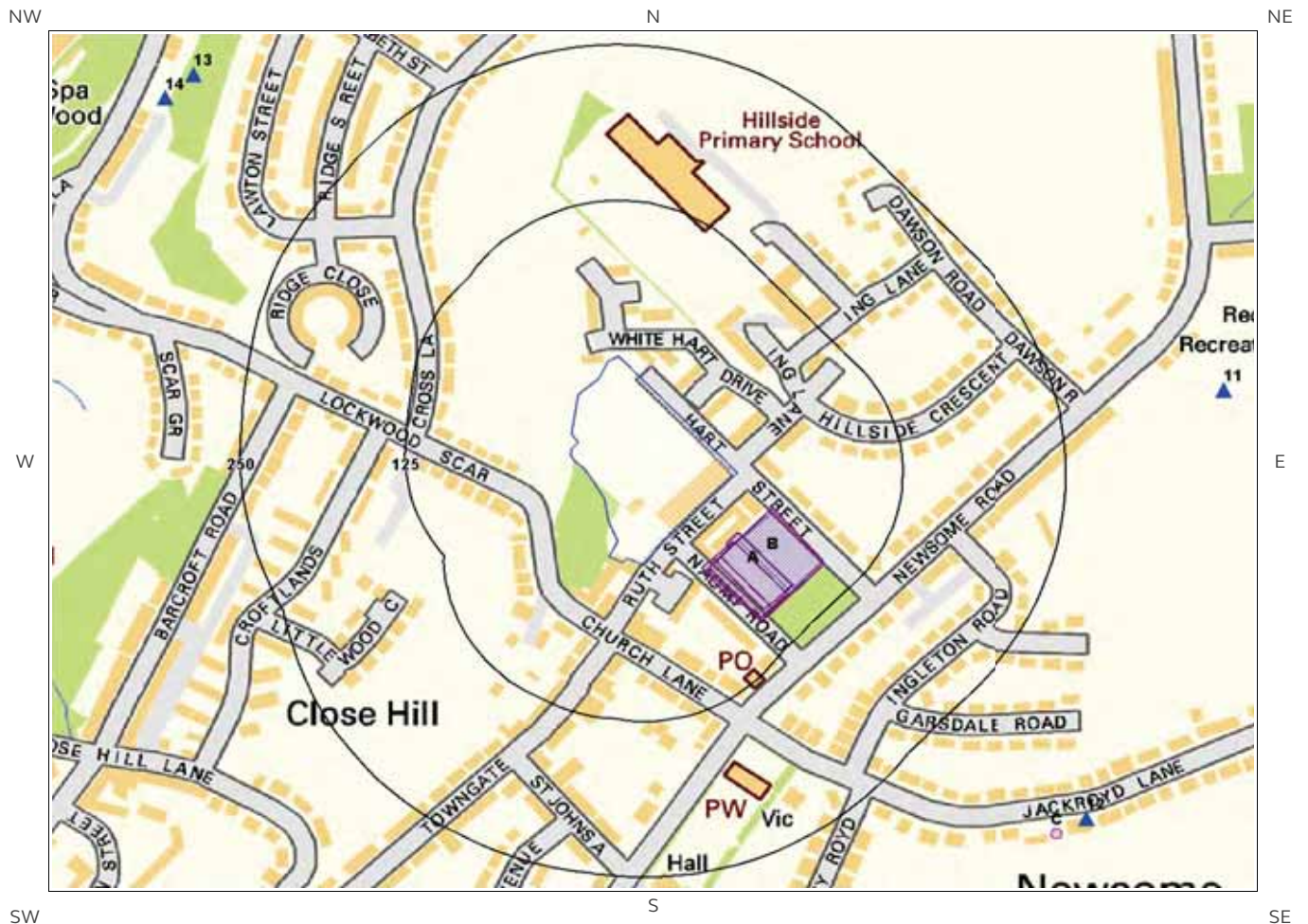
---

### 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.



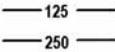


---

# 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
1A	34.0	SE	414424 414805	Mill Pond	1951
2A	35.0	SE	414418 414798	Pond	1888
3A	38.0	SE	414420 414796	Mill Pond	1905
4A	38.0	SE	414420 414796	Mill Pond	1948
5B	38.0	SE	414439 414815	Ponds	1969
6B	38.0	SE	414435 414810	Ponds	1984

## 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
7C	373.0	SE	414656 414594	Old Coal Shaft	1905
8C	373.0	SE	414656 414594	Unspecified Old Shaft	1948
Not shown	549.0	SE	414669 414363	Old Coal Shaft	1905
Not shown	677.0	N	414560 415708	Colliery	1905

## 4.3 Current Ground Workings

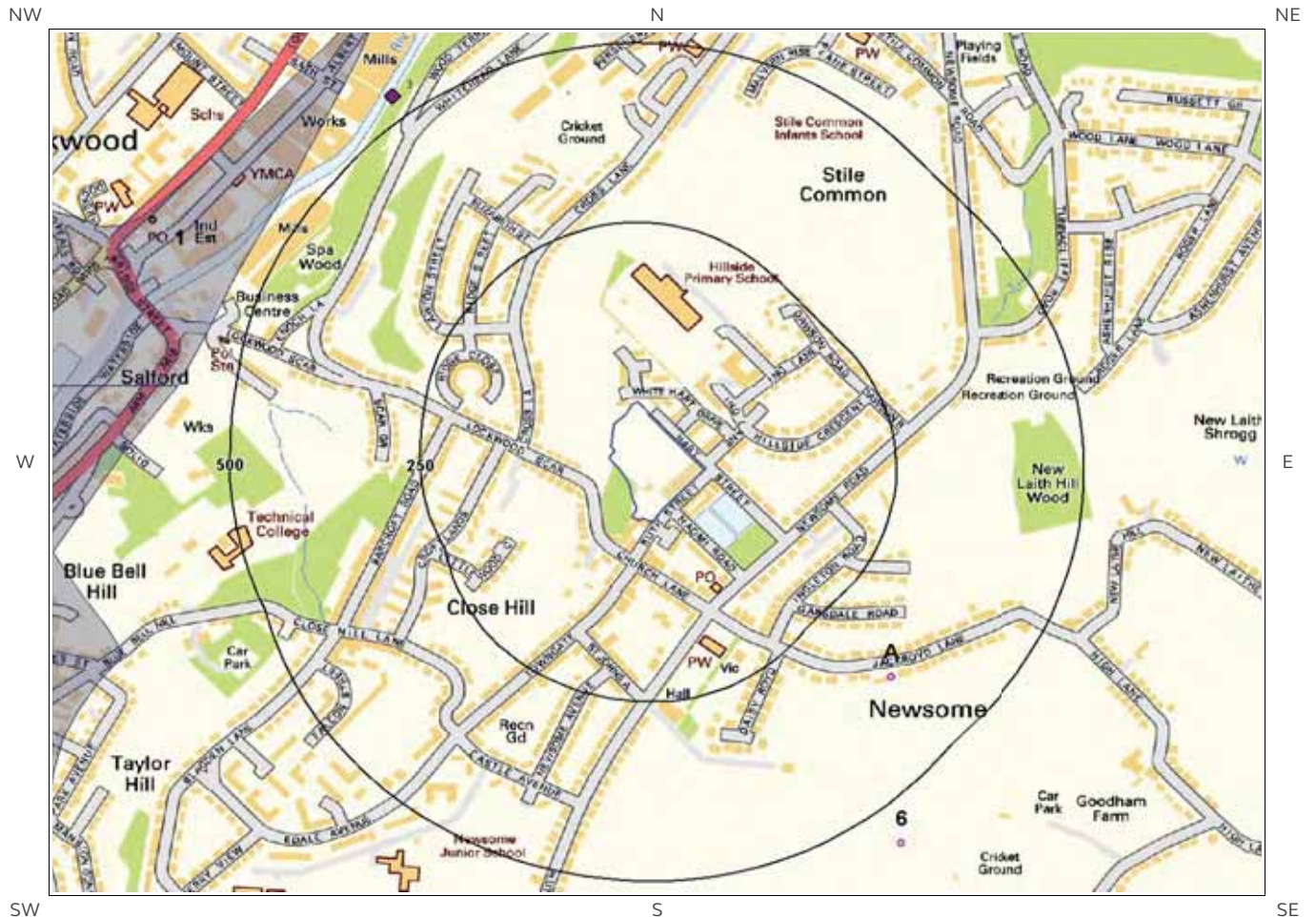
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

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:

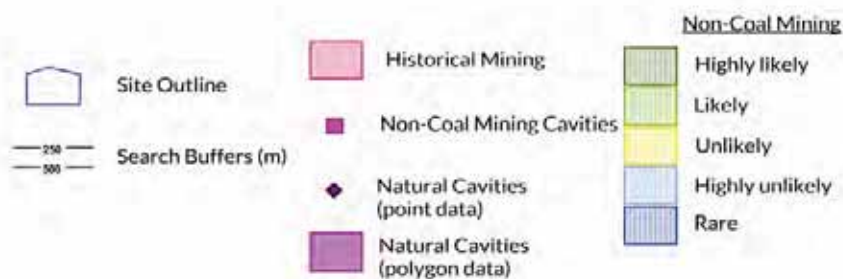
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
11	374.0	E	414781 414950	Sandstone	Nook	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
12	384.0	SE	414678 414606	Coal, Deep	Daisy Royd Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
13	388.0	NW	414001 415203	Coal, Deep	Woodton Coal Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
14	393.0	NW	413979 415184	Sandstone	Scar End	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	411.0	NW	414003 415242	Sandstone	Whitehead Lane	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	563.0	SE	414690 414367	Coal, Deep	Hall Bower Coal Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	618.0	SE	414736 414333	Sandstone	Hall Bower	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	820.0	NE	414930 415528	Sandstone	Ashing Hirst	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	882.0	E	415262 414646	Sandstone	New House	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	935.0	NW	413688 415667	Sandstone	Rashcliffe	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	941.0	NW	413773 415743	Sandstone	Rashcliffe	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
4A	373.0	SE	414656 414594	Unspecified Old Shaft	1948
5A	373.0	SE	414656 414594	Old Coal Shaft	1905
6	549.0	SE	414669 414363	Old Coal Shaft	1905
Not shown	677.0	N	414560 415708	Colliery	1905

## 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 study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

## 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? Yes

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

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	536.0	NW	Not available	Vein Mineral	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
2	576.0	W	Not available	Vein Mineral	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

## 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? Yes

The following Natural Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
3	530.0	NW	414000 415400	-	Millstone Grit Group	Gulls/Fissures due to Cambering x 1

## 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.

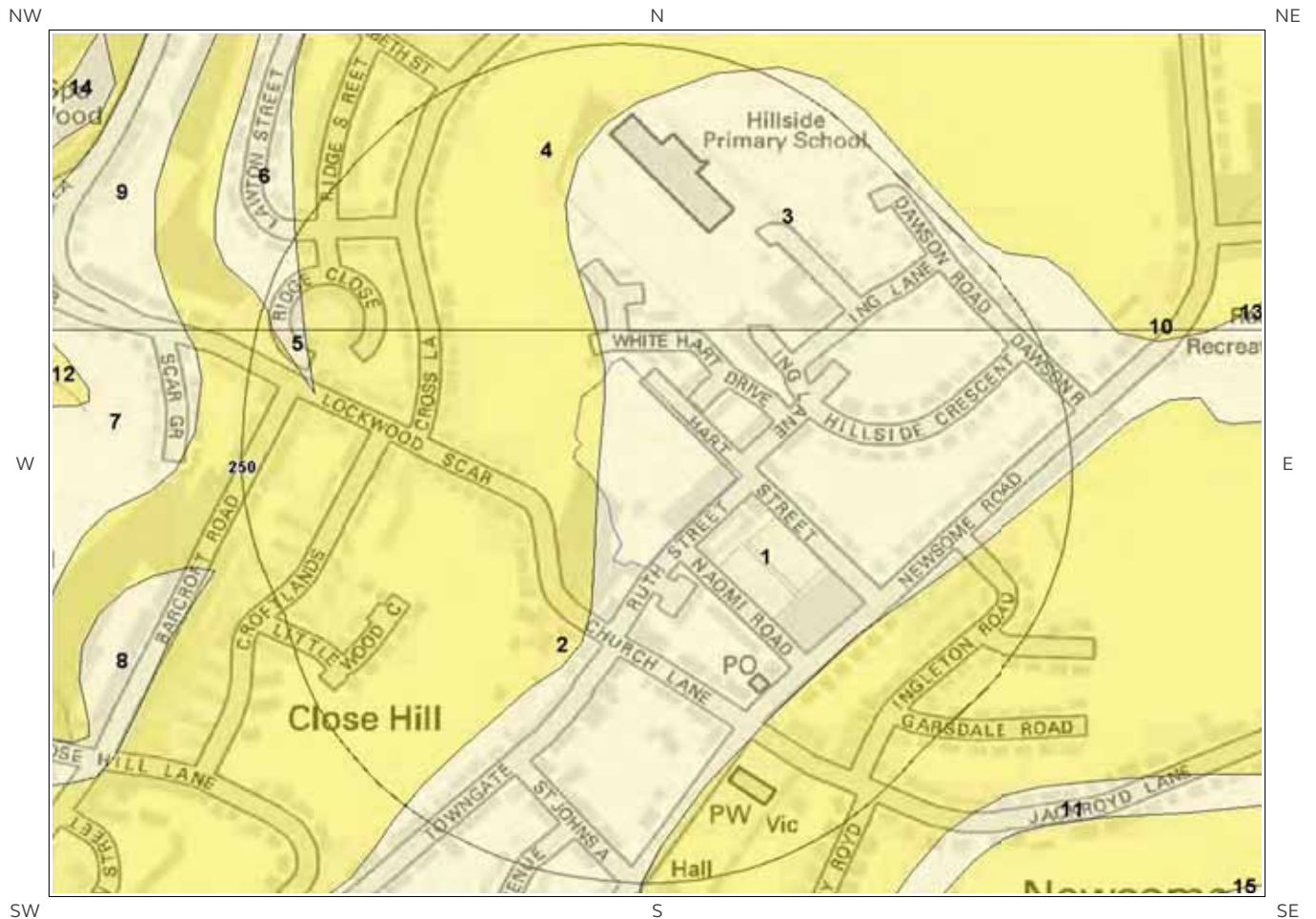
Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

---

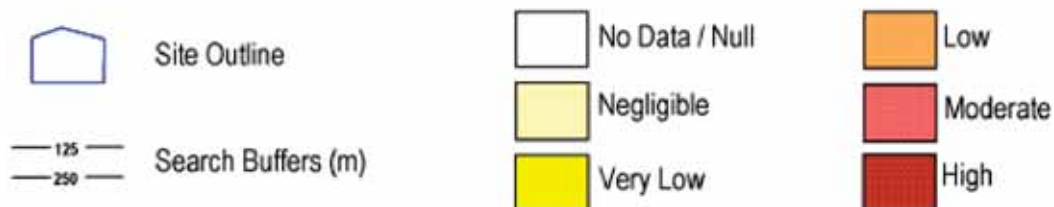
# 6 Natural Ground Subsidence

## 6.1 Shrink-Swell Clay map

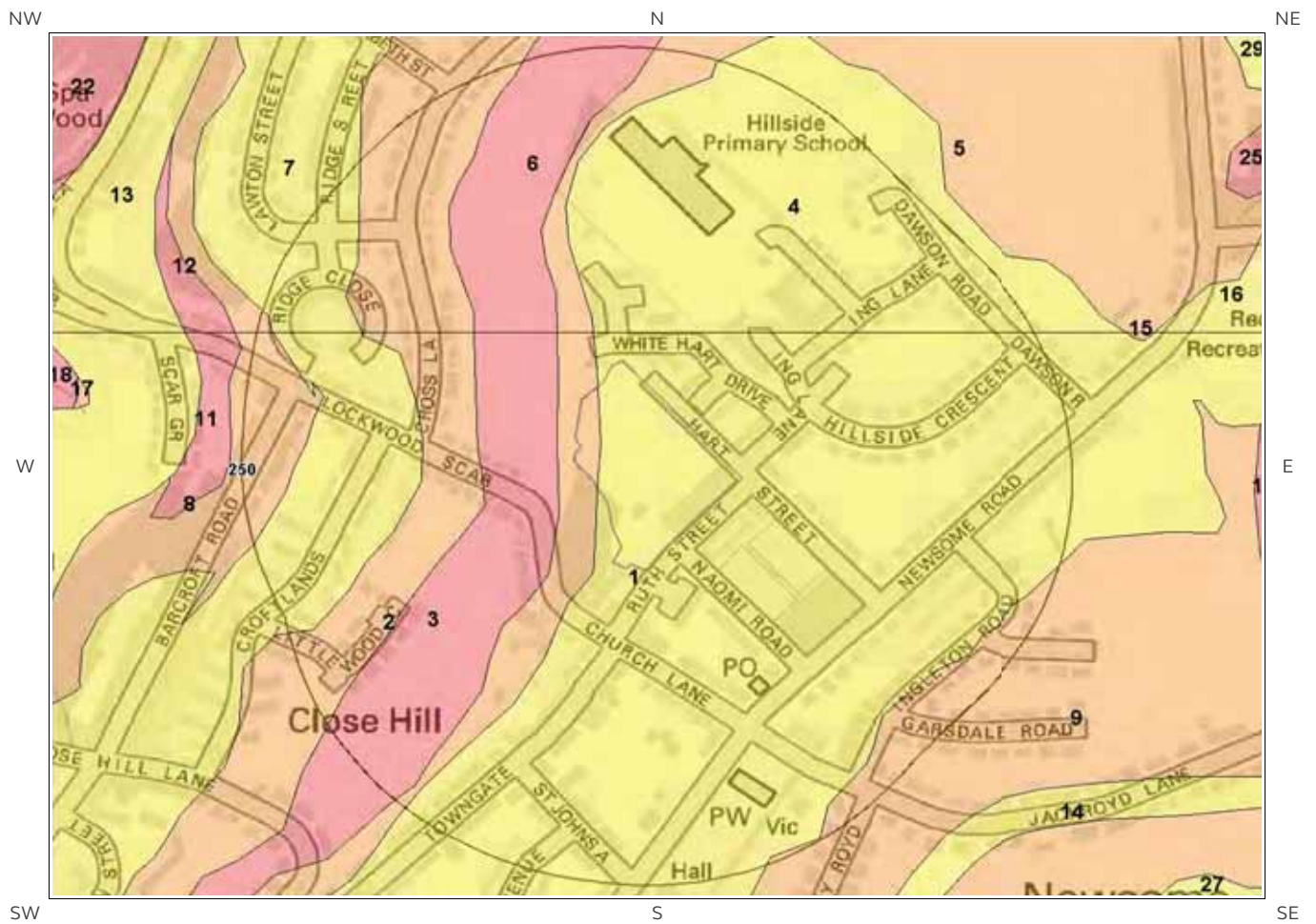


Shrink Swell Clay Legend

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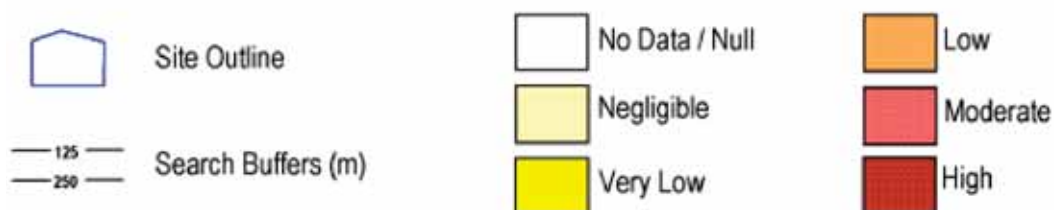


## 6.2 Landslides map

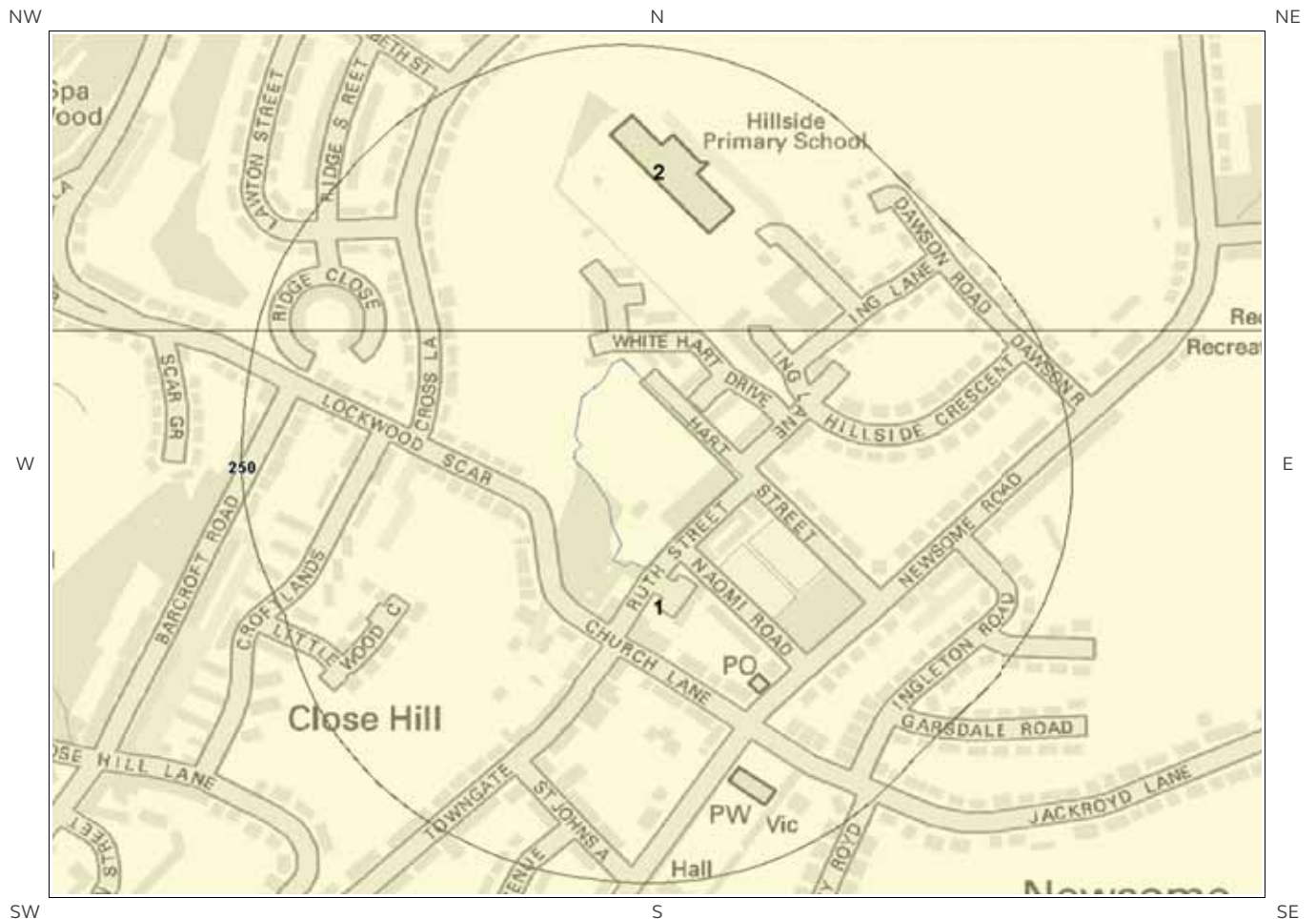


Landslides Legend

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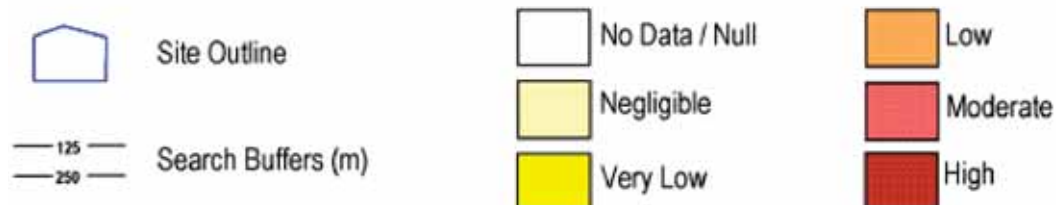


## 6.3 Ground Dissolution of Soluble Rocks map

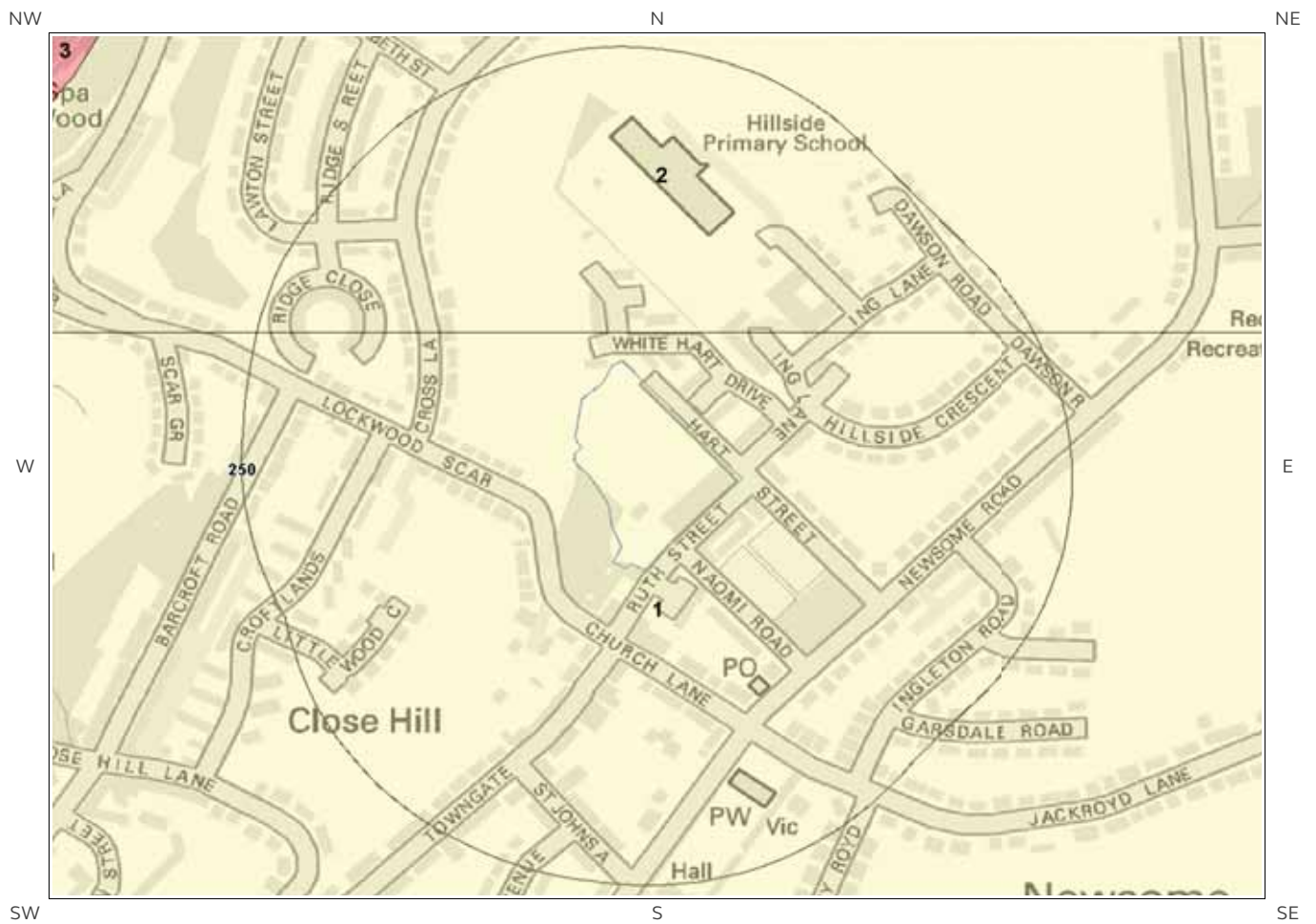


Ground Dissolution  
Soluble Rocks Legend

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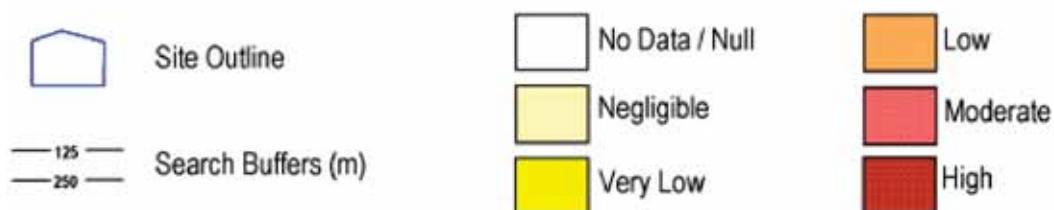


## 6.4 Compressible Deposits map

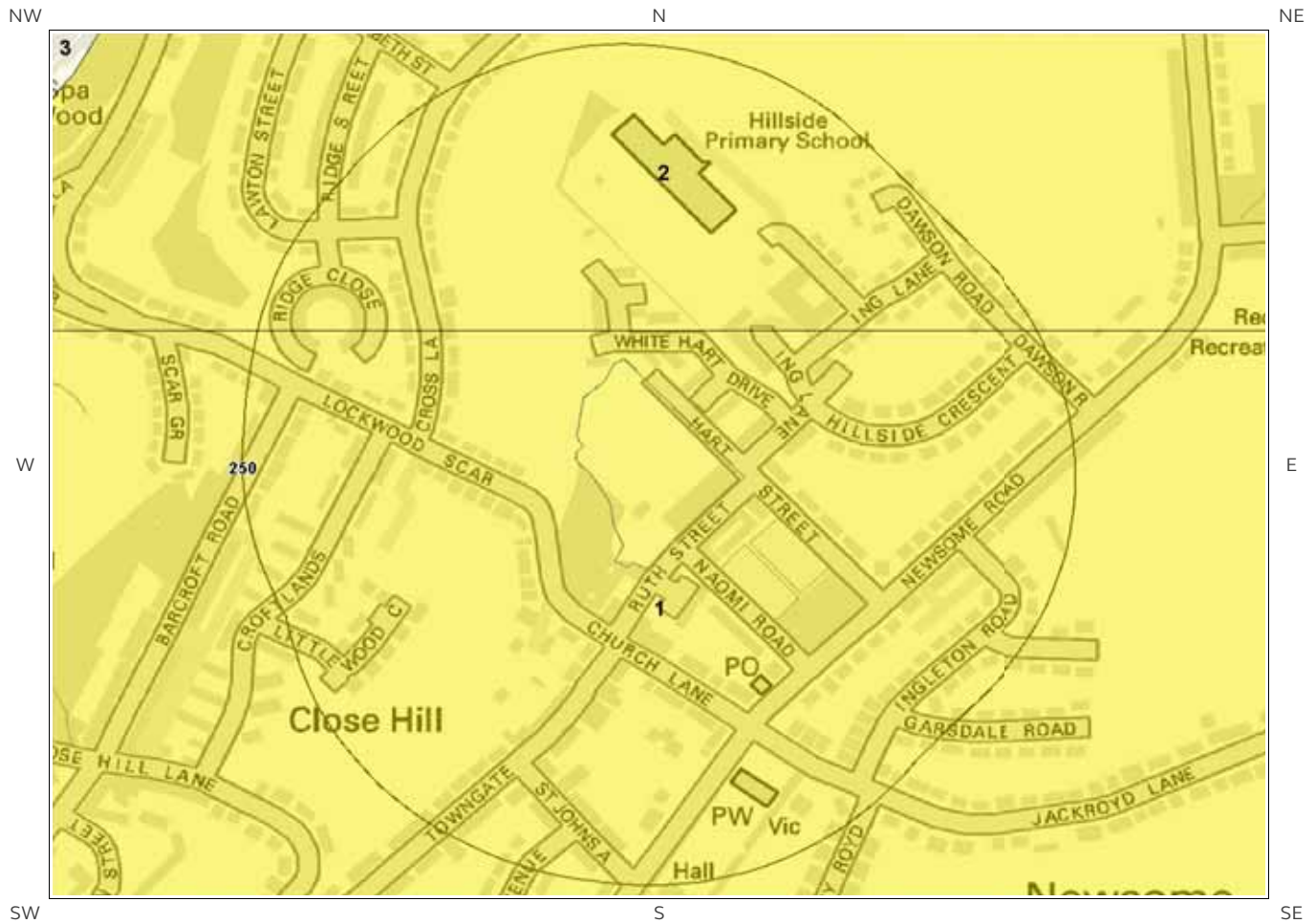


Compressible Deposits Legend

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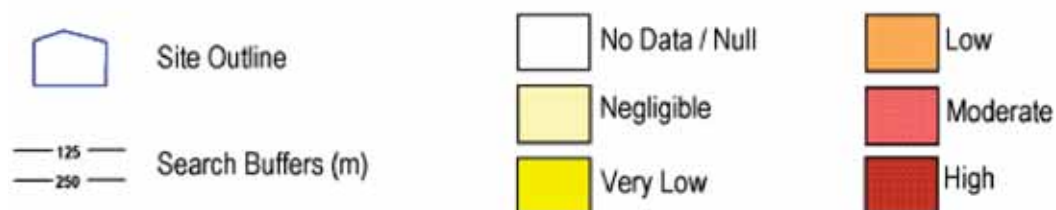


## 6.5 Collapsible Deposits map

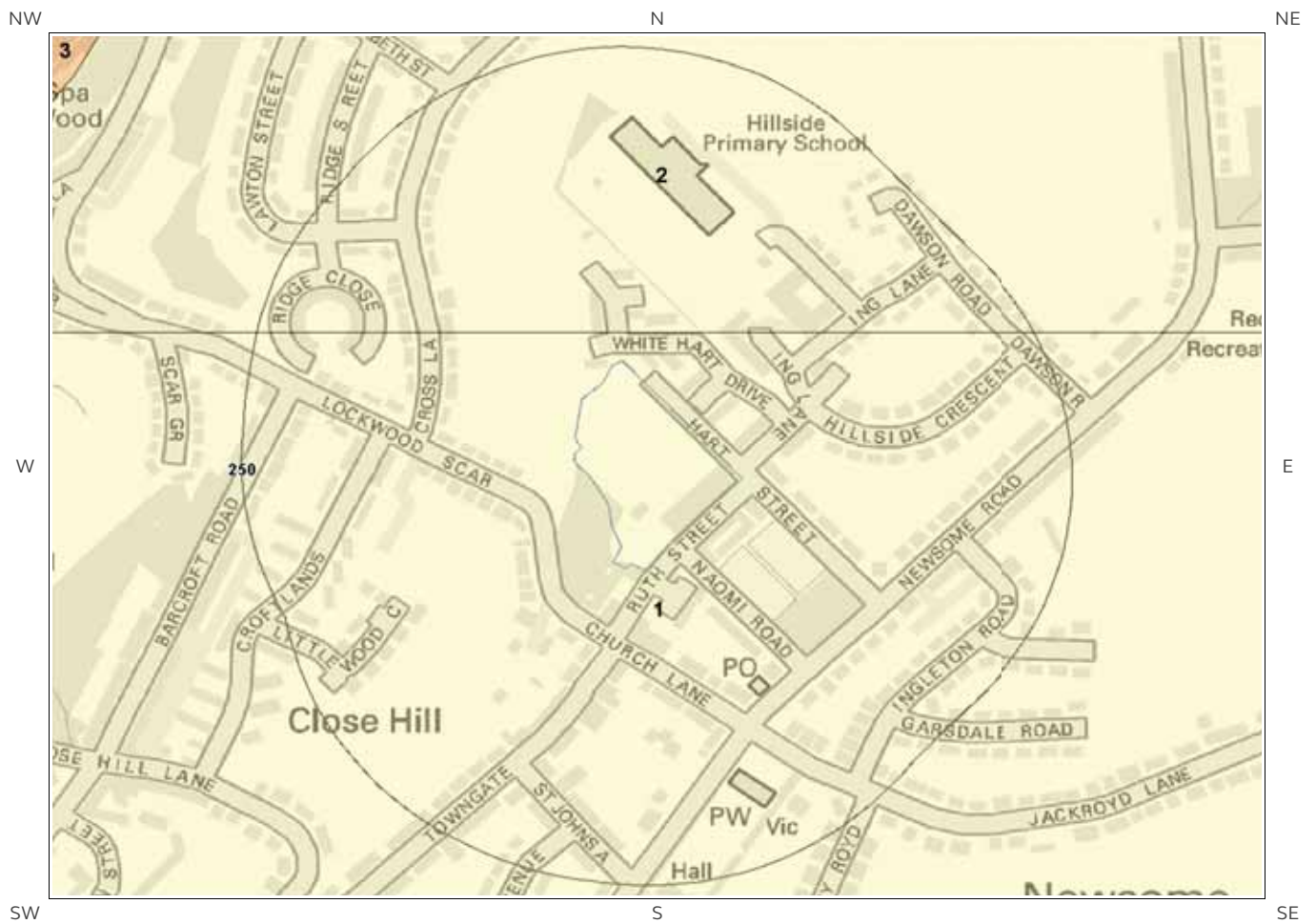


### Collapsible Deposits Legend

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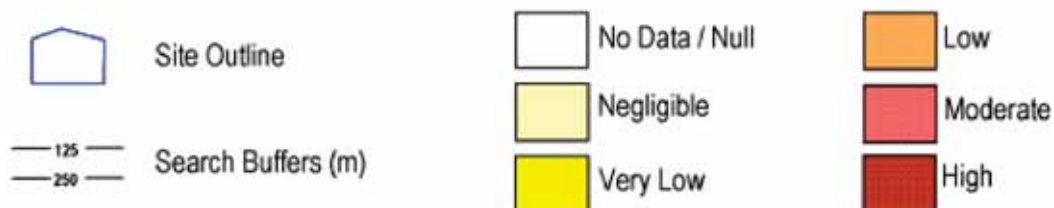


## 6.6 Running Sand map



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?      Moderate

## 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	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
3	23.0	N	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
4	29.0	NW	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	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.
3	12.0	W	Moderate	Significant potential for slope instability with relatively small changes in ground conditions. Avoid large amounts of water entering the ground through pipe leakage or soak-aways. Do not undercut or place large amounts of material on slopes without technical advice. For new build - consider the potential and consequences of ground movement during excavations, or consequence of changes to loading or drainage. For existing property - probable increase in insurance risk is likely due to potential natural slope instability after changes to ground conditions such as a very long, excessively wet winter.
4	23.0	N	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.
5	30.0	NW	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.
6	49.0	NW	Moderate	Significant potential for slope instability with relatively small changes in ground conditions. Avoid large amounts of water entering the ground through pipe leakage or soak-aways. Do not undercut or place large amounts of material on slopes without technical advice. For new build - consider the potential and consequences of ground movement during excavations, or consequence of changes to loading or drainage. For existing property - probable increase in insurance risk is likely due to potential natural slope instability after changes to ground conditions such as a very long, excessively wet winter.

## 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	23.0	N	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	23.0	N	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:

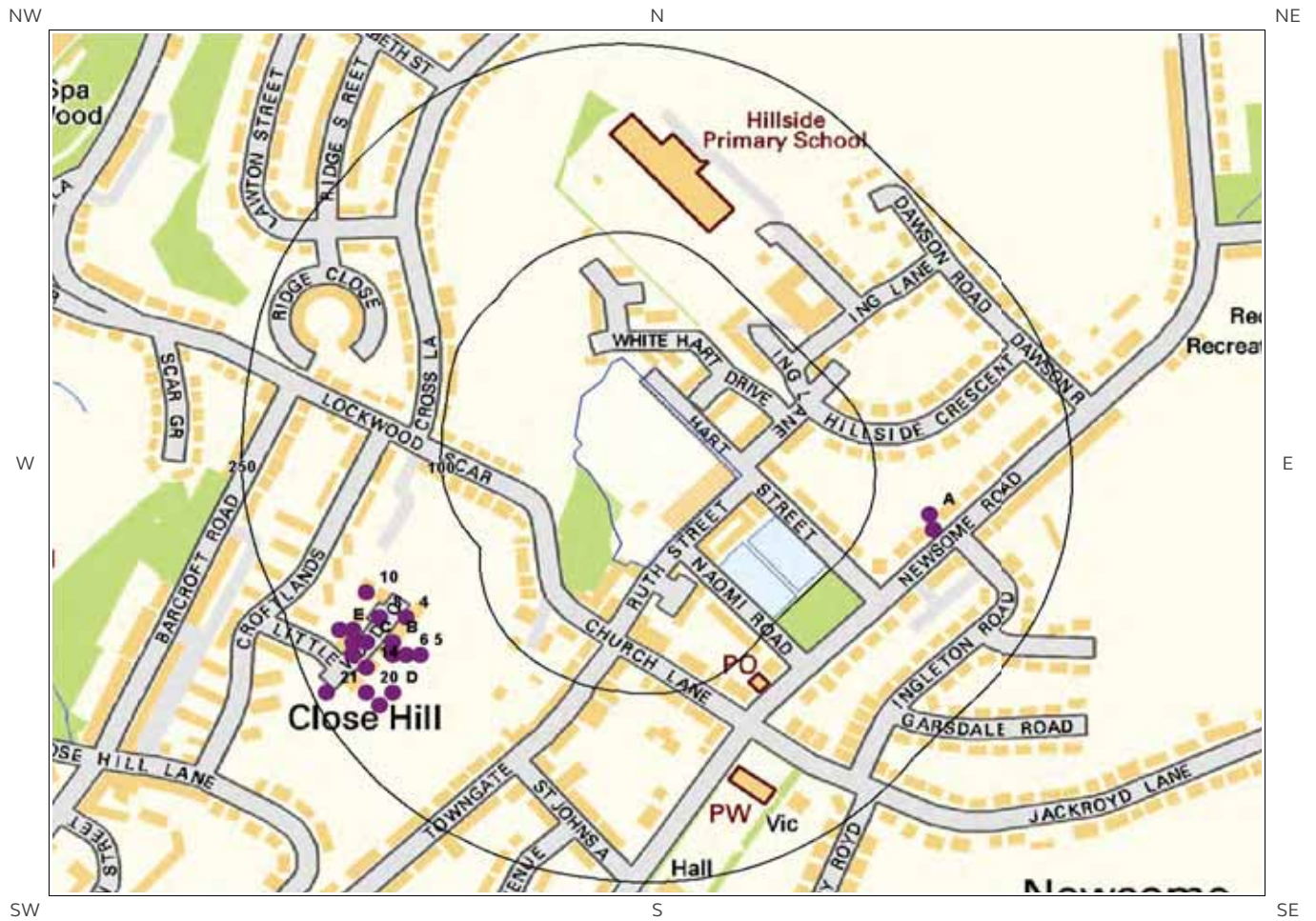
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	23.0	N	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:

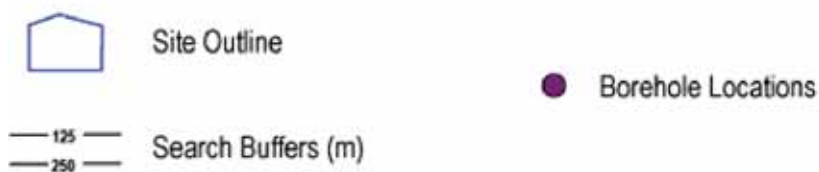
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	23.0	N	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:

21

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1A	144.0	E	414553 414852	SE11SW150	2.25	340 NEWSOME ROAD, HUDDERSFIELD 2
2A	150.0	E	414556 414840	SE11SW148	2.5	340 NEWSOME ROAD, HUDDERSFIELD 1
3A	150.0	E	414556 414840	SE11SW149	1.0	340 NEWSOME ROAD, HUDDERSFIELD TP1
4	162.0	W	414160 414770	SE11SW99	4.5	CROFTLANDS NEWSOME, HUDDERSFIELD TP 8
5	164.0	SW	414170 414740	SE11SW100	4.5	CROFTLANDS NEWSOME, HUDDERSFIELD TP 9
6	173.0	SW	414160 414740	SE11SW88	10.0	CROFTLANDS NEWSOME, HUDDERSFIELD 7
7B	178.0	W	414150 414750	SE11SW96	3.3	CROFTLANDS NEWSOME, HUDDERSFIELD TP 5
8	181.0	W	414140 414770	SE11SW98	3.7	CROFTLANDS NEWSOME, HUDDERSFIELD TP 7
9B	182.0	SW	414150 414740	SE11SW87	10.0	CROFTLANDS NEWSOME, HUDDERSFIELD 6
10	187.0	W	414130 414790	SE11SW97	3.5	CROFTLANDS NEWSOME, HUDDERSFIELD TP 6
11D	197.0	SW	414150 414710	SE11SW101	4.0	CROFTLANDS NEWSOME, HUDDERSFIELD TP 10
12C	197.0	W	414130 414750	SE11SW86	10.0	CROFTLANDS NEWSOME, HUDDERSFIELD 5
13C	203.0	W	414120 414760	SE11SW95	3.0	CROFTLANDS NEWSOME, HUDDERSFIELD TP 4
14	204.0	SW	414130 414730	SE11SW94	3.6	CROFTLANDS NEWSOME, HUDDERSFIELD TP 3
15C	206.0	W	414120 414750	SE11SW85	10.0	CROFTLANDS NEWSOME, HUDDERSFIELD 4
16C	210.0	W	414120 414740	SE11SW93	3.5	CROFTLANDS NEWSOME, HUDDERSFIELD TP 2

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
17D	211.0	SW	414140 414700	SE11SW102	3.5	CROFTLANDS NEWSOME, HUDERSFIELD TP 11
18E	213.0	W	414110 414760	SE11SW84	10.0	CROFTLANDS NEWSOME, HUDERSFIELD 3
19E	213.0	W	414110 414760	SE11SW83	20.0	CROFTLANDS NEWSOME, HUDERSFIELD 2
20	214.0	SW	414130 414710	SE11SW92	1.0	CROFTLANDS NEWSOME, HUDERSFIELD TP 1
21	240.0	SW	414100 414710	SE11SW82	27.9	CROFTLANDS NEWSOME, HUDERSFIELD 1

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.

[#1A: scans.bgs.ac.uk/sobi\\_scans/boreholes/18868889](https://scans.bgs.ac.uk/sobi_scans/boreholes/18868889)  
[#2A: scans.bgs.ac.uk/sobi\\_scans/boreholes/18868887](https://scans.bgs.ac.uk/sobi_scans/boreholes/18868887)  
[#3A: scans.bgs.ac.uk/sobi\\_scans/boreholes/18868888](https://scans.bgs.ac.uk/sobi_scans/boreholes/18868888)  
[#4: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327844](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327844)  
[#5: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327846](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327846)  
[#6: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327813](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327813)  
[#7B: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327831](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327831)  
[#8: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327842](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327842)  
[#9B: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327809](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327809)  
[#10: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327841](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327841)  
[#11D: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327848](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327848)  
[#12C: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327807](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327807)  
[#13C: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327829](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327829)  
[#14: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327828](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327828)  
[#15C: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327803](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327803)  
[#16C: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327827](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327827)  
[#17D: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327850](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327850)  
[#18E: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327801](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327801)  
[#19E: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327797](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327797)  
[#20: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327825](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327825)  
[#21: scans.bgs.ac.uk/sobi\\_scans/boreholes/13327785](https://scans.bgs.ac.uk/sobi_scans/boreholes/13327785)

# 8 Estimated Background Soil Chemistry

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

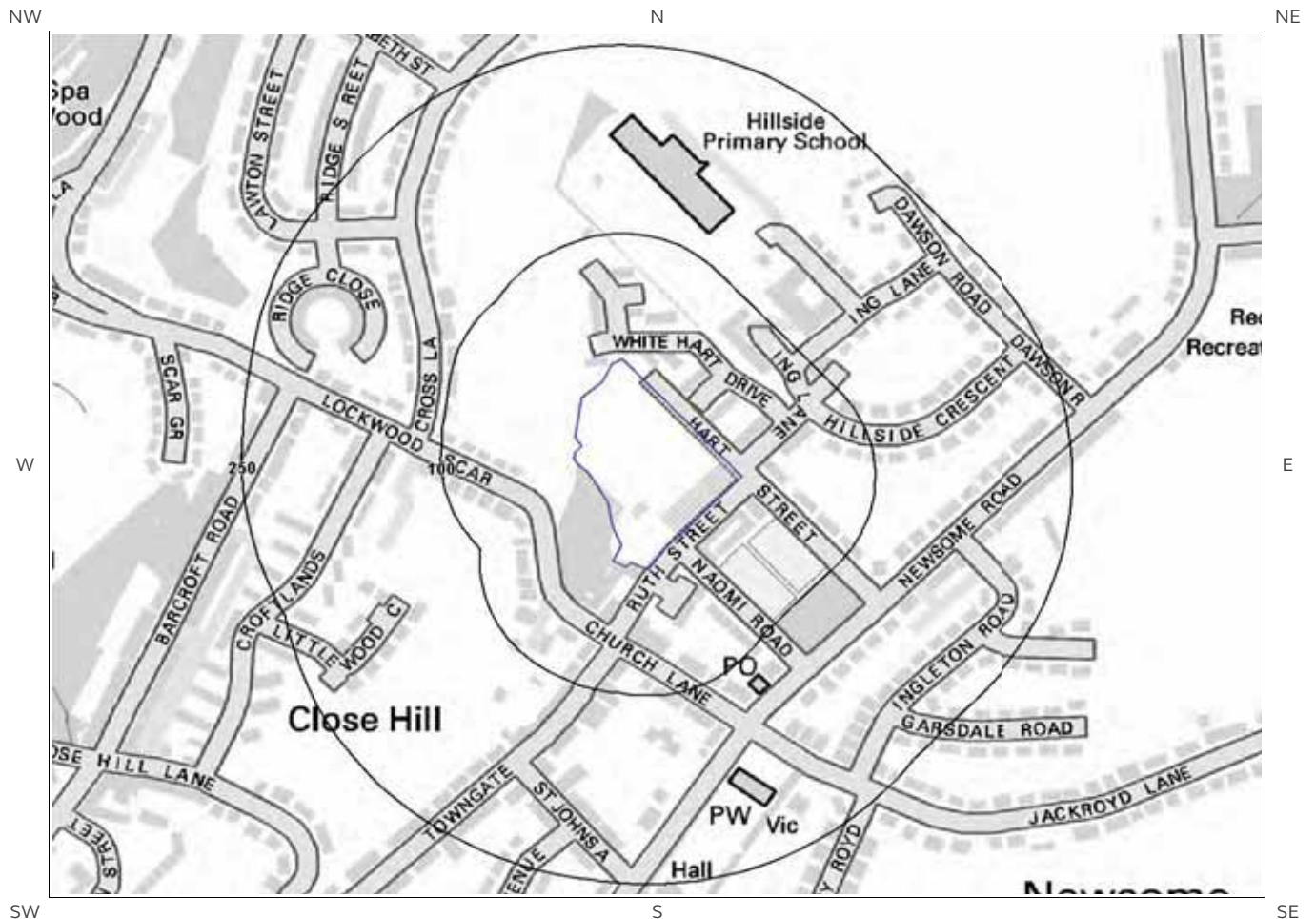
4

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	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
23.0	N	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
29.0	NW	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	>180 mg/kg	45 - 60 mg/kg	100 - 200 mg/kg

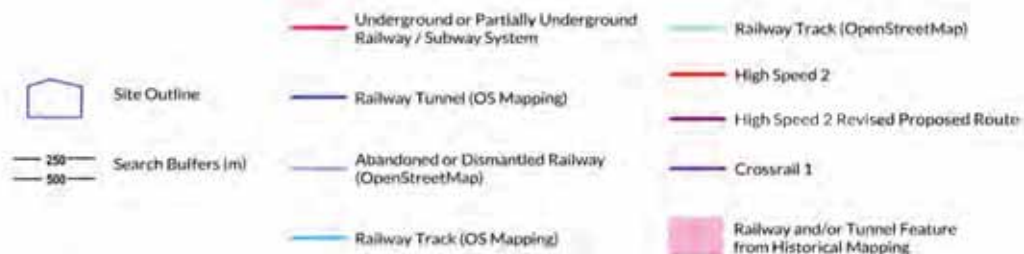
\*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

# 9 Railways and Tunnels map



Railways and Tunnels Legend

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Ordnance Survey licence 100035207.  
© 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? No

Database searched and no data found.

*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? 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.*

---

## 9.5 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.

# Contact Details

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BGS Geological Hazards Reports and general geological enquiries

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---

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---

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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-may25-2018>

# **APPENDI E**

**Groundsure Report**

**Historical Plans**



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

Groundsure Reference: GS-5658351  
Your Reference: PANORAMA\_LIVING\_7413  
Report Date 29 Nov 2018  
Report Delivery Method: Email - pdf

## Enviro Insight

Address: RUTH STREET, NEWSOME, HUDDERSFIELD, HD4 6JF

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,

A handwritten signature in black ink, appearing to be "J. O.", followed by a comma.

Managing Director  
Groundsure Limited

Enc.  
Groundsure Enviroinsight

Address: RUTH STREET, NEWSOME, HUDDERSFIELD, HD4 6JF

Date: 29 Nov 2018

Reference: GS-5658351

Client: Haigh Huddleston & Associates

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 26-Mar-2012

Grid Reference: 414342,414885

Site Size: 1.13ha

Report Reference: GS-5658351

Client Reference: PANORAMA\_LIVING\_7413

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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	7	4	0	40
1.2 Additional Information – Historical Tank Database	0	2	0	0
1.3 Additional Information – Historical Energy Features Database	0	3	21	6
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	0
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	7	0	26
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	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	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	0	0
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	0	0	0	3
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	1
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	4
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	9	4

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	1	11	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	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	0	0	1	13
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	5	18
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	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	#250GWV #	#500GWV #	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	Yes	Yes
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	0	14	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	Yes	No	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	0	0	10
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	3
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	0
8.14 Records of Green Belt land	0	0	0	1	0	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	Moderate
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.

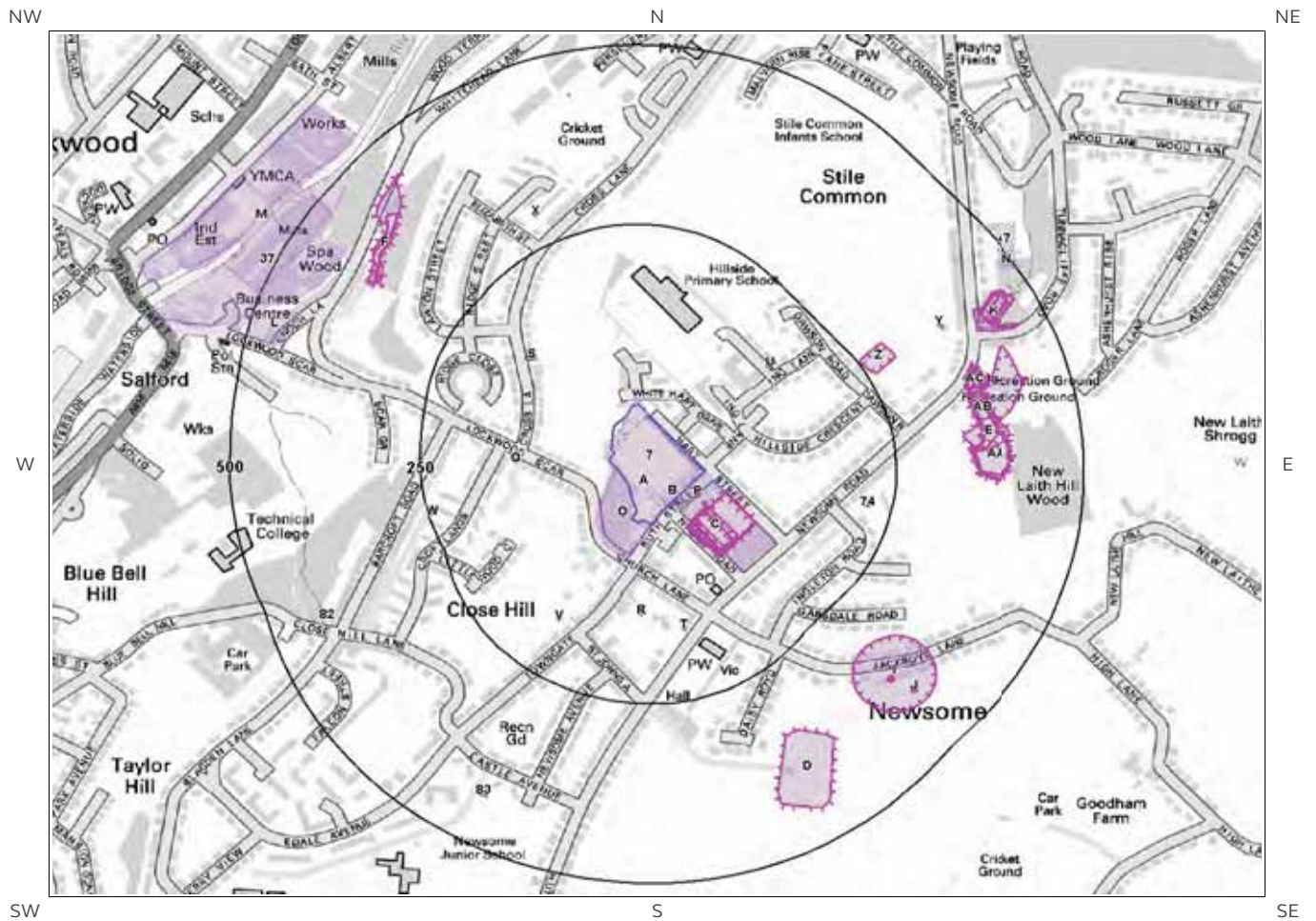
## Note: Maps

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).

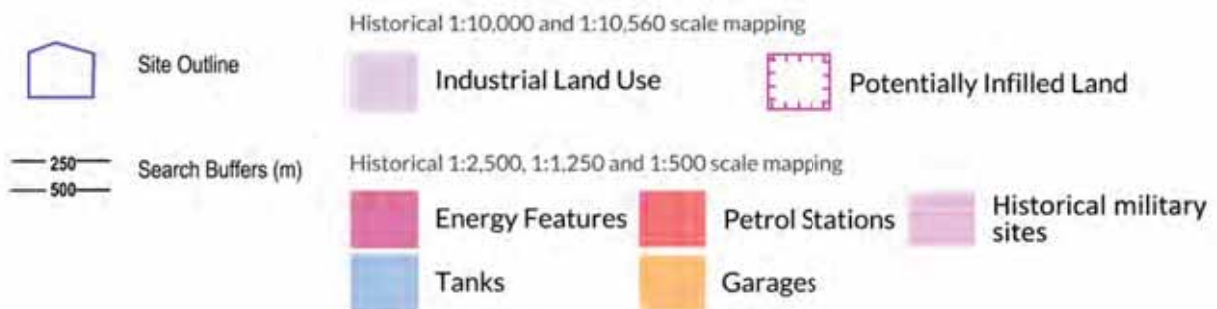
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

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: 51

ID	Distance [m]	Direction	Use	Date
1A	0	On Site	Unspecified Mills	1984
2B	0	On Site	Unspecified Mills	1969
3A	0	On Site	Unspecified Mills	1888
4A	0	On Site	Unspecified Mills	1948
5A	0	On Site	Unspecified Mills	1905
6B	0	On Site	Unspecified Mills	1951
7	0	On Site	Unspecified Mills	1938
8C	34	SE	Mill Pond	1951
9C	37	SE	Mill Pond	1938
10C	38	SE	Mill Pond	1905
11C	38	SE	Mill Pond	1948
12Z	253	NE	Unspecified Ground Workings	1905
13I	322	SE	Unspecified Old Shaft	1951
14E	341	E	Unspecified Quarry	1905
15D	343	SE	Unspecified Ground Workings	1969
16D	343	SE	Unspecified Ground Workings	1984
17AA	350	E	Unspecified Disused Quarry	1948
18E	352	E	Unspecified Disused Quarry	1938
19E	354	E	Unspecified Disused Quarry	1951
20AB	359	E	Cuttings	1948
21H	361	E	Unspecified Pits	1888
22AC	363	E	Cuttings	1905
23F	367	NW	Unspecified Ground Workings	1938
24F	367	NW	Unspecified Ground Workings	1938
25G	369	NW	Unspecified Ground Workings	1905
26G	369	NW	Unspecified Ground Workings	1888
27G	369	NW	Unspecified Ground Workings	1948

28H	370	E	Unspecified Pit	1956
29I	373	SE	Unspecified Old Shaft	1948
30I	373	SE	Old Coal Shaft	1905
31J	403	SE	Unspecified Old Shaft	1938
32J	403	SE	Unspecified Old Shaft	1938
33K	407	NE	Unspecified Ground Workings	1888
34K	422	NE	Unspecified Heap	1938
35K	422	NE	Unspecified Heap	1938
36K	423	NE	Unspecified Heap	1948
37	428	NW	Field Works	1905
38K	431	NE	Unspecified Heap	1956
39L	439	W	Unspecified Mills	1985
40L	451	W	Unspecified Mills	1975
41M	470	NW	Unspecified Mills	1985
42M	474	NW	Unspecified Mills	1975
43M	477	NW	Unspecified Mills	1938
44M	477	NW	Unspecified Mills	1956
45M	477	NW	Unspecified Mills	1966
46M	479	NW	Unspecified Mill	1948
47	480	NE	Unspecified Tanks	1938
48N	482	NE	Unspecified Tanks	1948
49N	485	NE	Unspecified Tanks	1956
50N	490	NE	Unspecified Tanks	1948
51N	495	NE	Unspecified Tanks	1956

## 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:

2

ID	Distance (m)	Direction	Use	Date
52O	11	NW	Unspecified Tank	1913
53O	14	SW	Unspecified Tank	1906

## 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:

30

ID	Distance (m)	Direction	Use	Date
54P	12	SE	Electricity Substation	1970
55P	27	SE	Electricity Substation	1996
56P	27	SE	Electricity Substation	1993
57Q	122	W	Electricity Substation	1993
58Q	122	W	Electricity Substation	1996
59Q	123	W	Electricity Substation	1970
60R	123	S	Electricity Substation	1970
61R	124	S	Electricity Substation	1996
62R	124	S	Electricity Substation	1993
63S	138	NW	Electricity Substation	1985
64S	138	NW	Electricity Substation	1973
65T	145	S	Electricity Substation	1970
66T	146	S	Electricity Substation	1993
67T	146	S	Electricity Substation	1996
68U	159	NE	Electricity Substation	1985
69U	159	NE	Electricity Substation	1973
70V	166	SW	Electricity Substation	1993
71V	166	SW	Electricity Substation	1996
72U	166	NE	Electricity Substation	1990
73U	167	NE	Electricity Substation	1993
74	215	E	Electricity Substation	1967
75W	243	W	Electricity Substation	1996
76W	243	W	Electricity Substation	1993
77W	243	W	Electricity Substation	1970
78X	293	NW	Electricity Substation	1985
79X	294	NW	Electricity Substation	1973
80Y	365	NE	Electricity Substation	1990
81Y	367	NE	Electricity Substation	1993
82	421	W	Electricity Substation	1993
83	426	SW	Electricity Substation	1984

## 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: 0

Database searched and no data found.

## 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

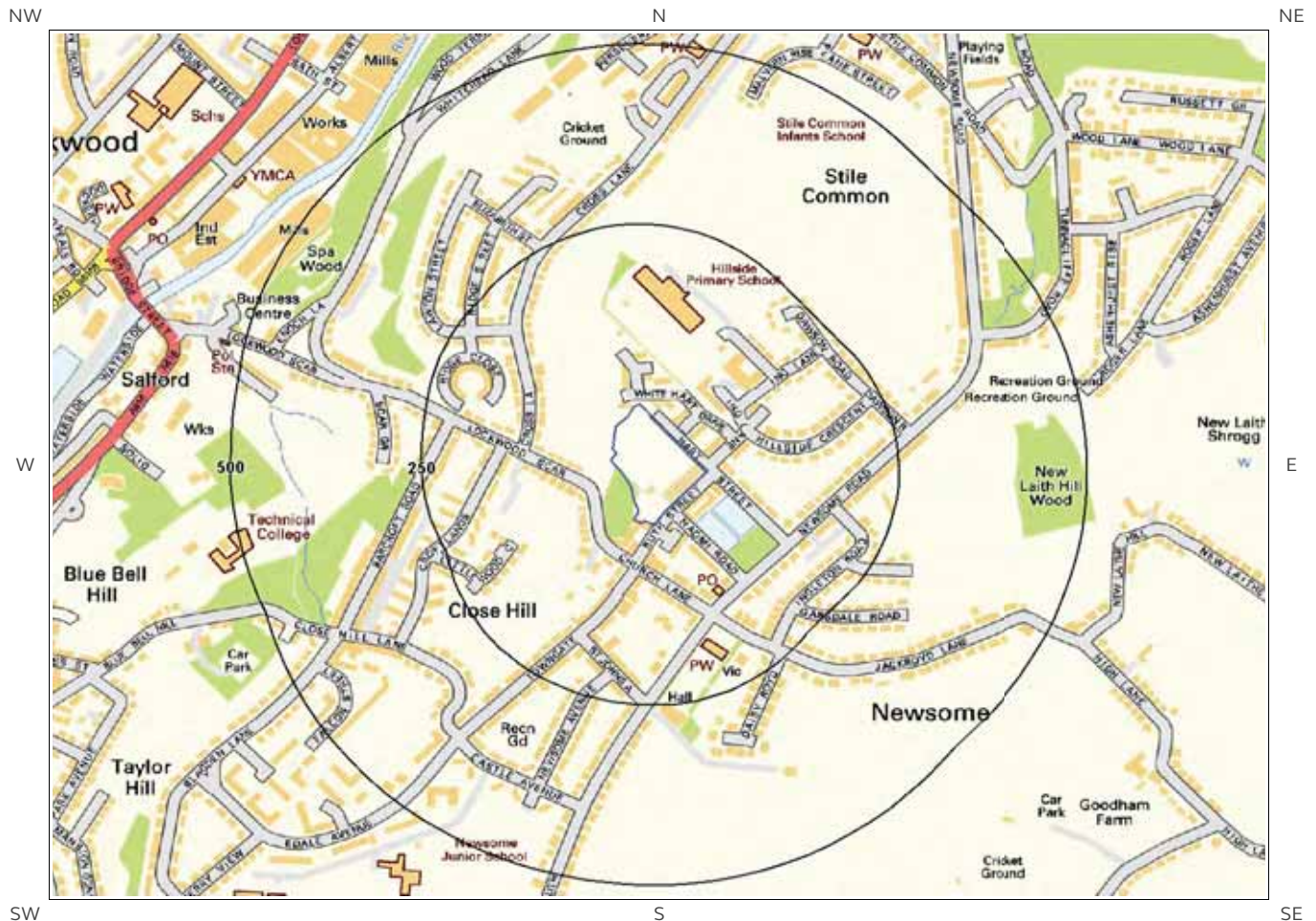
Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 33

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

ID	Distance(m)	Direction	Use	Date
84C	34	SE	Mill Pond	1951
85C	35	SE	Pond	1888
86C	37	SE	Mill Pond	1938
87C	38	SE	Mill Pond	1948
88C	38	SE	Mill Pond	1905
89C	38	SE	Ponds	1969
90C	38	SE	Ponds	1984
91Z	253	NE	Unspecified Ground Workings	1905
92I	322	SE	Unspecified Old Shaft	1951
93E	341	E	Unspecified Quarry	1905
94D	343	SE	Unspecified Ground Workings	1969
95D	343	SE	Unspecified Ground Workings	1984
96AA	350	E	Unspecified Disused Quarry	1948
97E	352	E	Unspecified Disused Quarry	1938
98E	354	E	Unspecified Disused Quarry	1951
99AB	359	E	Cuttings	1948
100H	361	E	Unspecified Pits	1888

101AC	363	E	Cuttings	1905
102F	367	NW	Unspecified Ground Workings	1938
103F	367	NW	Unspecified Ground Workings	1938
104G	369	NW	Unspecified Ground Workings	1888
105G	369	NW	Unspecified Ground Workings	1905
106G	369	NW	Unspecified Ground Workings	1948
107H	370	E	Unspecified Pit	1956
108I	373	SE	Old Coal Shaft	1905
109I	373	SE	Unspecified Old Shaft	1948
110J	403	SE	Unspecified Old Shaft	1938
111J	403	SE	Unspecified Old Shaft	1938
112K	407	NE	Unspecified Ground Workings	1888
113K	422	NE	Unspecified Heap	1938
114K	422	NE	Unspecified Heap	1938
115K	423	NE	Unspecified Heap	1948
116K	431	NE	Unspecified Heap	1956

## 2. Environmental Permits, Incidents and Registers Map



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## 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:

0

Database searched and no data found.

---

#### 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:

0

Database searched and no data found.

#### 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:

0

Database searched and no data found.

---

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

0

Database searched and no data found.

---

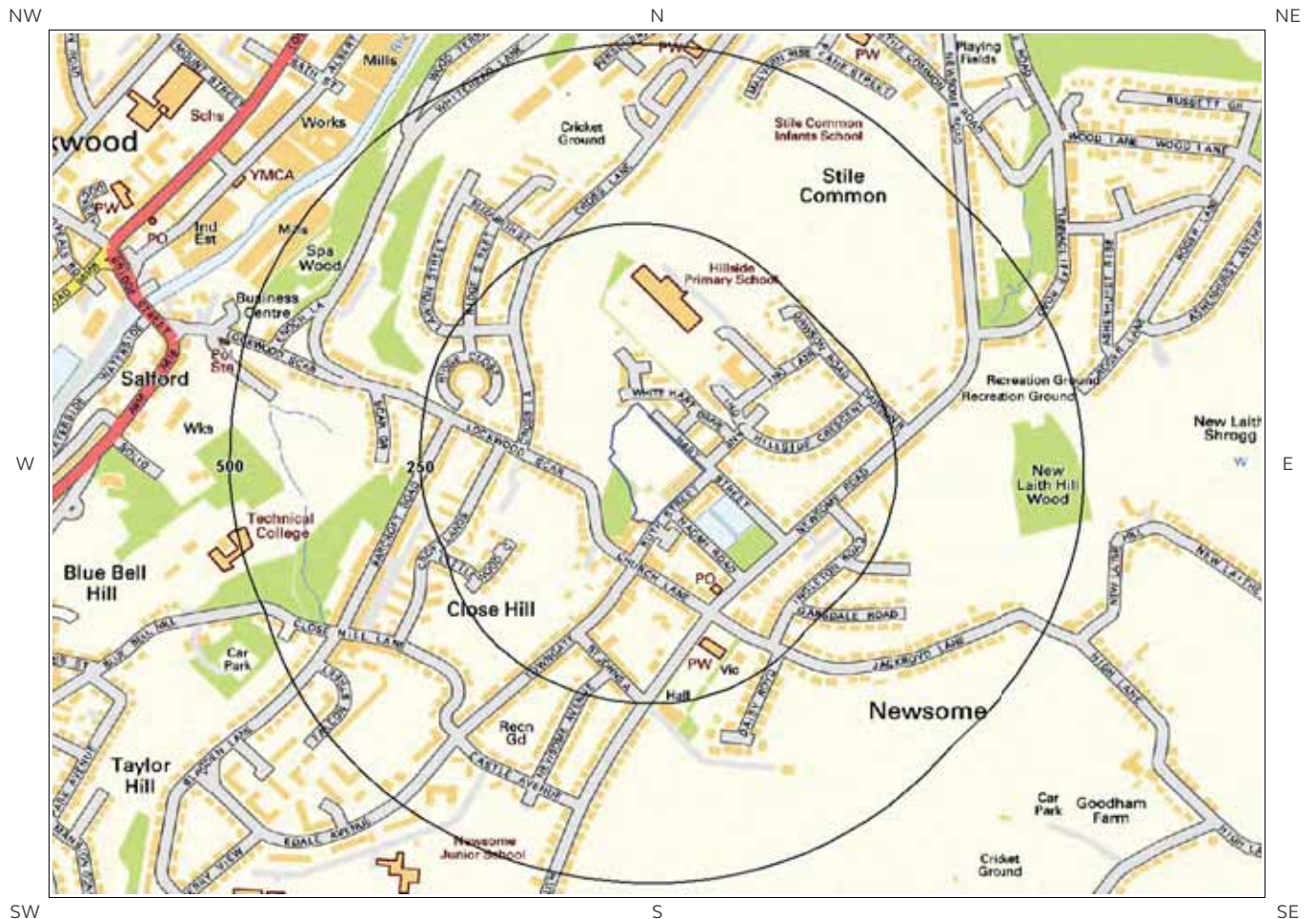
## 2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

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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— 250 — Search Buffers (m)  
— 500 —

-  EA/NRW Active Landfill
-  Historic and Planned Waste Sites
-  EA/NRW Historic Landfill
-  EA/NRW Licensed Waste Site
-  BGS / DoE Survey Landfill
-  Local Authority/Historical Mapping Landfill Records

# 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:

3

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

ID	Distance (m)	Direction	NGR	Details
Not shown	1046	W		Site Address: Allotments, Meltham Road, Lockwood, Huddersfield 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	1096	S		Site Address: Berry Brow Tip Site, Off Hood Street, Huddersfield, West Yorkshire Waste Licence: - Site Reference: - Waste Type: Inert, Industrial, Commercial, Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1951 Last Recorded: 31-Dec-1975
Not shown	1410	W		Site Address: Dry Clough, Walpole Road, Crosland Moor Waste Licence: - Site Reference: - Waste Type: Inert, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 01-Jan-1968 Last Recorded: 31-Dec-1974

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

1

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

ID	Distance (m)	Direction	NGR	Details
Not shown	1218	S	414200.0 413600.0	Address: Berry Brow Tip, off Hood St, Huddersfield BGS Number: 1033.0  Risk: No risk to aquifer Waste Type: N/A

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

4

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

ID	Distance (m)	Direction	NGR	Site Address	Source	Data Type
Not shown	1098	S	414162 413626	Refuse Tip	1961 mapping	Polygon
Not shown	1141	SE	415118 413894	Refuse Tip	1961 mapping	Polygon
Not shown	1150	S	413982 413639	Refuse Tip	1969 mapping	Polygon
Not shown	1434	W	412891 415303	Refuse Tip	1966 mapping	Polygon

## 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:

13

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

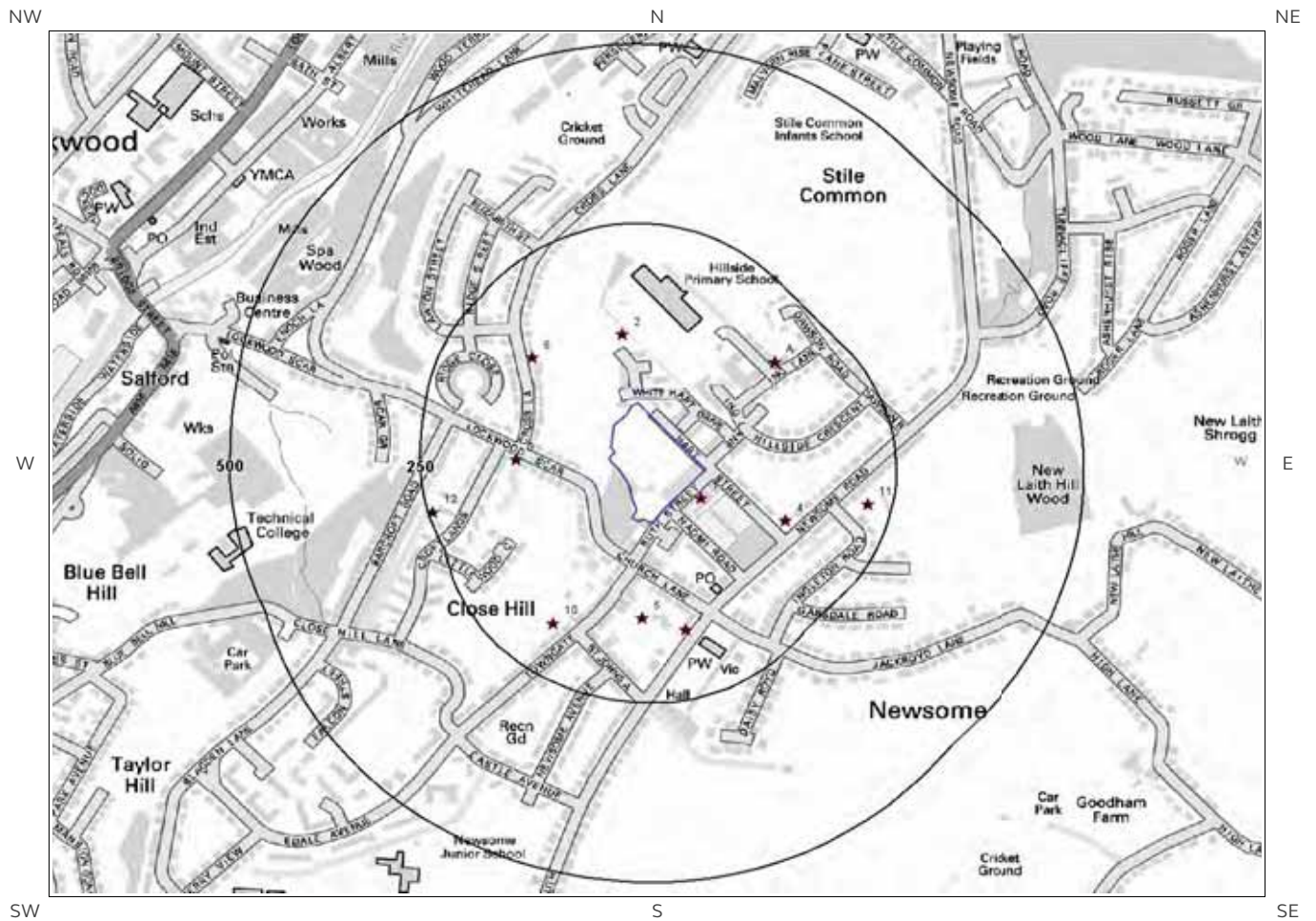
ID	Distance (m)	Direction	NGR	Details
Not	631	N	414138	Site Address: Scotland Yard, Queens Mill Issue Date: 25/01/1999

ID	Distance (m)	Direction	NGR	Details
shown			415581	<p>Road, Lockwood, Huddersfield, West Yorkshire, HD1</p> <p>Type: Household, Commercial &amp; Industrial Waste T Stn</p> <p>Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: 000085</p> <p>EPR reference: -</p> <p>Operator: Holme Valley Skip Hire Ltd</p> <p>Waste Management licence No: 65045</p> <p>Annual Tonnage: 0.0</p> <p>Effective Date: 29/01/2004</p> <p>Modified: -</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Transferred</p> <p>Site Name: Scotland Yard</p> <p>Correspondence Address: Ringham Works, Wortley Moor Road, Wortley, Leeds, LS12 4NF</p>
Not shown	631	N	414138 415581	<p>Site Address: Scotland Yard, Queens Mill Road, Lockwood, Huddersfield, West Yorkshire, HD1</p> <p>Type: Household, Commercial &amp; Industrial Waste T Stn</p> <p>Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: GAR002</p> <p>EPR reference: -</p> <p>Operator: Lees Gareth</p> <p>Waste Management licence No: 65045</p> <p>Annual Tonnage: 0.0</p> <p>Issue Date: 25/01/1999</p> <p>Effective Date: -</p> <p>Modified: -</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Issued</p> <p>Site Name: Holme Valley Skip Hire</p> <p>Correspondence Address: Scotland Yard, Queens Mill Road, Lockwood, Huddersfield, West Yorkshire, HD1 3PG</p>
Not shown	631	N	414138 415581	<p>Site Address: Scotland Yard, Queens Mill Road, Lockwood, Huddersfield, West Yorkshire, HD1</p> <p>Type: Household, Commercial &amp; Industrial Waste T Stn</p> <p>Size: &gt;= 75000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: 000085</p> <p>EPR reference: -</p> <p>Operator: Holme Valley Skip Hire Ltd</p> <p>Waste Management licence No: 65045</p> <p>Annual Tonnage: 0.0</p> <p>Issue Date: 25/01/1999</p> <p>Effective Date: 29/01/2004</p> <p>Modified: 04/02/2005</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Modified</p> <p>Site Name: Scotland Yard</p> <p>Correspondence Address: Ringham Works, Wortley Moor Road, Wortley, Leeds, LS12 4NF</p>
Not shown	749	N	414260 415724	<p>Site Address: Scotland Yard, Queens Mill Road, Lockwood, Huddersfield, West Yorkshire, HD1 3PG</p> <p>Type: Household, Commercial &amp; Industrial Waste T Stn</p> <p>Size: &gt;= 75000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: 000085</p> <p>EPR reference: EA/EPR/FP3194ZX/V002</p> <p>Operator: Huddersfield Skip Hire Services Ltd</p> <p>Waste Management licence No: 65045</p> <p>Annual Tonnage: 100000.0</p> <p>Issue Date: 25/01/1999</p> <p>Effective Date: 29/01/2004</p> <p>Modified: 04/02/2005</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Modified</p> <p>Site Name: Scotland Yard</p> <p>Correspondence Address: -</p>
Not shown	749	N	414260 415724	<p>Site Address: Scotland Yard, Queens Mill Road, Lockwood, Huddersfield, West Yorkshire, HD1 3PG</p> <p>Type: Household, Commercial &amp; Industrial Waste T Stn</p> <p>Size: &gt;= 75000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: HUN059</p> <p>EPR reference: EA/EPR/AB3206TC/T001</p> <p>Operator: Hunter Group Yorkshire Ltd</p> <p>Waste Management licence No: 65045</p> <p>Annual Tonnage: 100000.0</p> <p>Issue Date: 25/01/1999</p> <p>Effective Date: 27/08/2013</p> <p>Modified: 04/02/2005</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Transferred</p> <p>Site Name: Scotland Yard</p> <p>Correspondence Address: -</p>
Not shown	749	N	414260 415724	<p>Site Address: Scotland Yard, Queens Mill Road, Lockwood, Huddersfield, West Yorkshire, HD1 3PG</p> <p>Type: Household, Commercial &amp; Industrial Waste T Stn</p> <p>Size: &lt; 25000 tonnes</p> <p>Issue Date: 25/01/1999</p> <p>Effective Date: 27/08/2013</p> <p>Modified: 04/02/2005</p> <p>Surrendered Date: -</p> <p>Expiry Date: 27/02/2017</p> <p>Cancelled Date: -</p>

ID	Distance (m)	Direction	NGR	Details
				<p>Environmental Permitting Regulations (Waste) Licence Number: HUN059  EPR reference: EA/EPR/AB3206TC/T001  Operator: Hunter Group Yorkshire Ltd  Waste Management licence No: 65045  Annual Tonnage: 100000.0</p> <p>Status: Expired  Site Name: Scotland Yard  Correspondence Address: -</p>
Not shown	749	N	414260 415724	<p>Site Address: Scotland Yard, Queens Mill Road, Lockwood, Huddersfield, West Yorkshire, HD1 3PG  Type: Household, Commercial &amp; Industrial Waste T Stn  Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: JSB009  EPR reference: EA/EPR/DB3534AB/T001  Operator: J S Bamforth &amp; Co Ltd  Waste Management licence No: 65045  Annual Tonnage: 100000.0</p> <p>Issue Date: 25/01/1999  Effective Date: 05/01/2012  Modified: 04/02/2005  Surrendered Date: -  Expiry Date: -  Cancelled Date: -  Status: Transferred  Site Name: Scotland Yard  Correspondence Address: -</p>
Not shown	943	N	414043 415878	<p>Site Address: Highway Depot, Hemsworth Lane, Fitzwilliam, Wakefield, West Yorkshire, WF9 5AZ  Type: Household Waste Amenity Site  Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: SHA118  EPR reference: EA/EPR/EB3139RY/S002  Operator: Shanks Waste Management Ltd  Waste Management licence No: 61913  Annual Tonnage: 0.0</p> <p>Issue Date: 08/03/1996  Effective Date: 25/02/2013  Modified: -  Surrendered Date: 30/07/2015  Expiry Date: -  Cancelled Date: -  Status: Surrendered  Site Name: Fitzwilliam H W R C  Correspondence Address: -</p>
Not shown	943	N	414043 415878	<p>Site Address: Highway Depot, Hemsworth Lane, Fitzwilliam, Wakefield, West Yorkshire, WF9 5AZ  Type: Household Waste Amenity Site  Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: SHA118  EPR reference: EA/EPR/EB3139RY/S002  Operator: Shanks Waste Management Limited  Waste Management licence No: 61913  Annual Tonnage: 0.0</p> <p>Issue Date: 08/03/1996  Effective Date: 25/02/2013  Modified: -  Surrendered Date: 30/07/2015  Expiry Date: -  Cancelled Date: -  Status: Surrendered  Site Name: Fitzwilliam H W R C  Correspondence Address: -</p>
Not shown	1156	NE	414765 416045	<p>Site Address: Land/premises At, Firth Street, Huddersfield, West Yorkshire, HD1 3BD  Type: Metal Recycling Site (Vehicle Dismantler)  Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: ELL002  EPR reference: EA/EPR/ZP3594ZH/A001  Operator: Albert Haigh &amp; Son Limited  Waste Management licence No: 65065  Annual Tonnage: 4999.0</p> <p>Issue Date: 29/06/2000  Effective Date: -  Modified: -  Surrendered Date: -  Expiry Date: -  Cancelled Date: -  Status: Issued  Site Name: Albert Haigh &amp; Son Ltd  Correspondence Address: -</p>
Not shown	1156	NE	414765 416045	<p>Site Address: Land/premises At, Firth Street, Huddersfield, West Yorkshire, HD1 3BD  Type: Metal Recycling Site (Vehicle Dismantler)  Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: ELL002  EPR reference: EA/EPR/ZP3594ZH/A001  Operator: Ellis Barrie K  Waste Management licence No: 65065  Annual Tonnage: 4999.0</p> <p>Issue Date: 29/06/2000  Effective Date: -  Modified: -  Surrendered Date: -  Expiry Date: -  Cancelled Date: -  Status: Issued  Site Name: Albert Haigh &amp; Son Ltd  Correspondence Address: -</p>

ID	Distance (m)	Direction	NGR	Details
Not shown	1156	NE	414765 416045	<p>Site Address: Albert Haigh &amp; Son Ltd, Firth Street, Huddersfield, West Yorkshire, HD1 3BD</p> <p>Type: Metal Recycling Site (Vehicle Dismantler)</p> <p>Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: ELL002</p> <p>EPR reference: EA/EPR/ZP3594ZH/V002</p> <p>Operator: Albert Haigh &amp; Son Ltd</p> <p>Waste Management licence No: 65065</p> <p>Annual Tonnage: 4999.0</p> <p>Issue Date: 29/06/2000</p> <p>Effective Date: -</p> <p>Modified: 20/01/2012</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Modified</p> <p>Site Name: Albert Haigh &amp; Son Ltd</p> <p>Correspondence Address: -</p>
Not shown	1484	NW	413405 416146	<p>Site Address: The Triangle, Paddock Foot, Huddersfield, West Yorkshire, HD1 4RY</p> <p>Type: Metal Recycling Site (Vehicle Dismantler)</p> <p>Size: &lt; 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: ISL001</p> <p>EPR reference: EA/EPR/TP3595ZX/T001</p> <p>Operator: Islam Mohammad</p> <p>Waste Management licence No: 61032</p> <p>Annual Tonnage: 9600.0</p> <p>Issue Date: 11/08/1993</p> <p>Effective Date: 02/08/2001</p> <p>Modified: -</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Transferred</p> <p>Site Name: Huddersfield Auto Salvage</p> <p>Correspondence Address: -</p>

# 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:

12

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

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	22	SE	Electricity Sub Station	414405 414845	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
2	98	N	Television Mast	414302 415073	West Yorkshire, HD4	Telecommunications Features	Infrastructure and Facilities
3	124	W	Electricity Sub Station	414162 414899	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
4	125	SE	Auto Access Solutions Ltd	414516 414814	342, Newsome Road, Huddersfield, West Yorkshire, HD4 6LP	Fences, Gates and Railings	Industrial Products
5	132	S	Electricity Sub Station	414328 414678	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
6	143	NW	Electricity Sub Station	414184 415041	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
7	154	S	Electricity Sub Station	414385 414662	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
8A	169	NE	Electricity Sub Station	414502 415035	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
9A	170	NE	Electricity Sub Station	414503 415035	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
10	179	SW	Electricity Sub Station	414211 414671	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
11	217	E	Electricity Sub Station	414625 414837	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities
12	244	W	Electricity Sub Station	414053 414826	West Yorkshire, HD4	Electrical Features	Infrastructure and Facilities

### 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

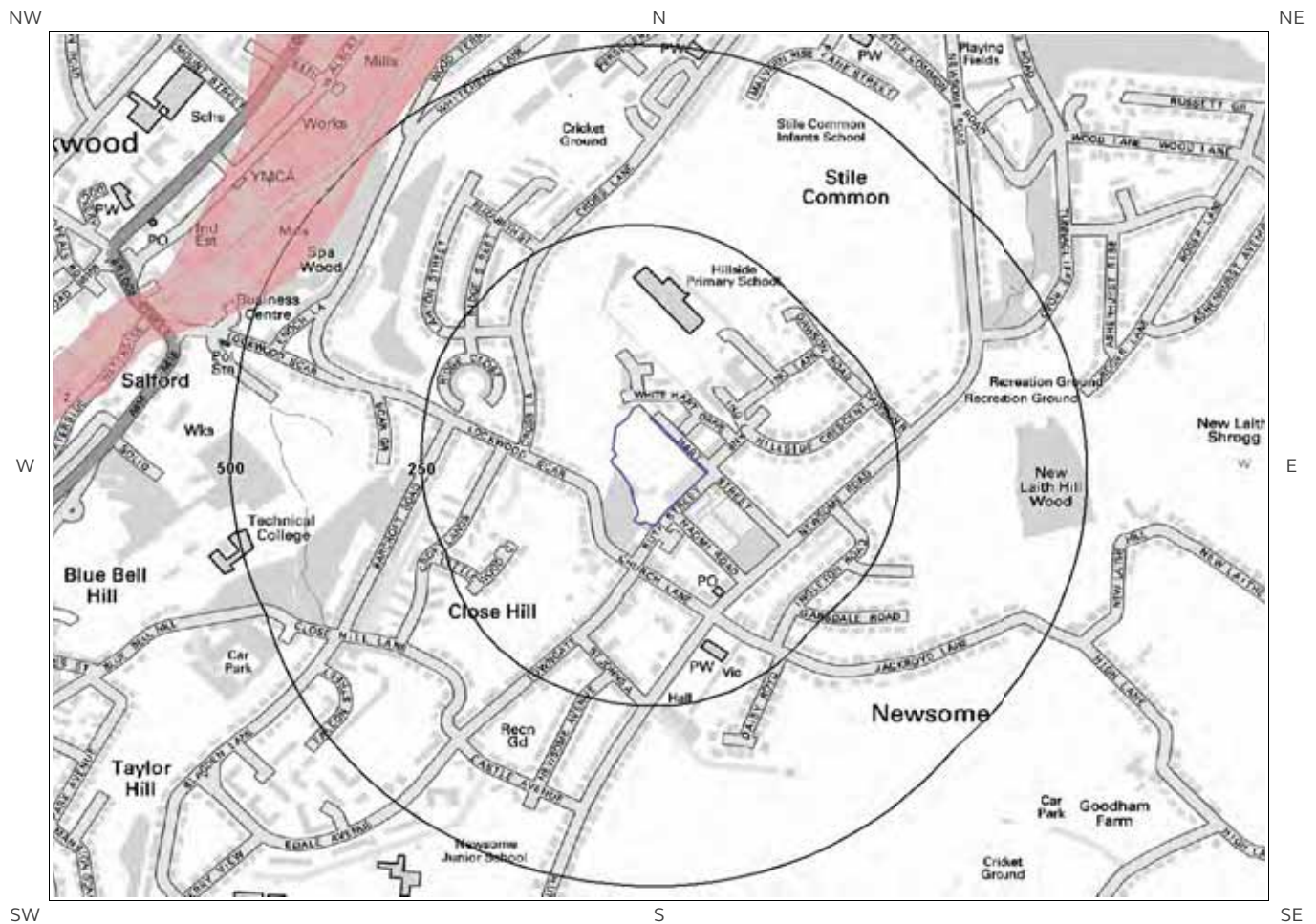
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
STNR-SDST	STANNINGLEY ROCK	SANDSTONE
PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE

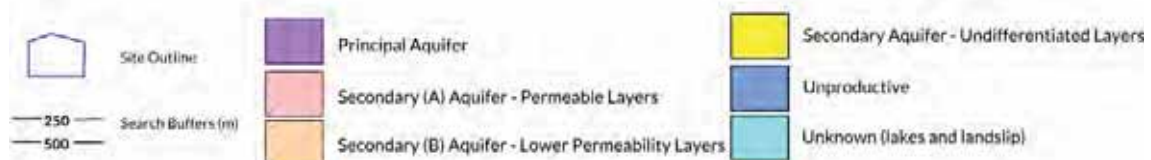
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

# 6 Hydrogeology and Hydrology

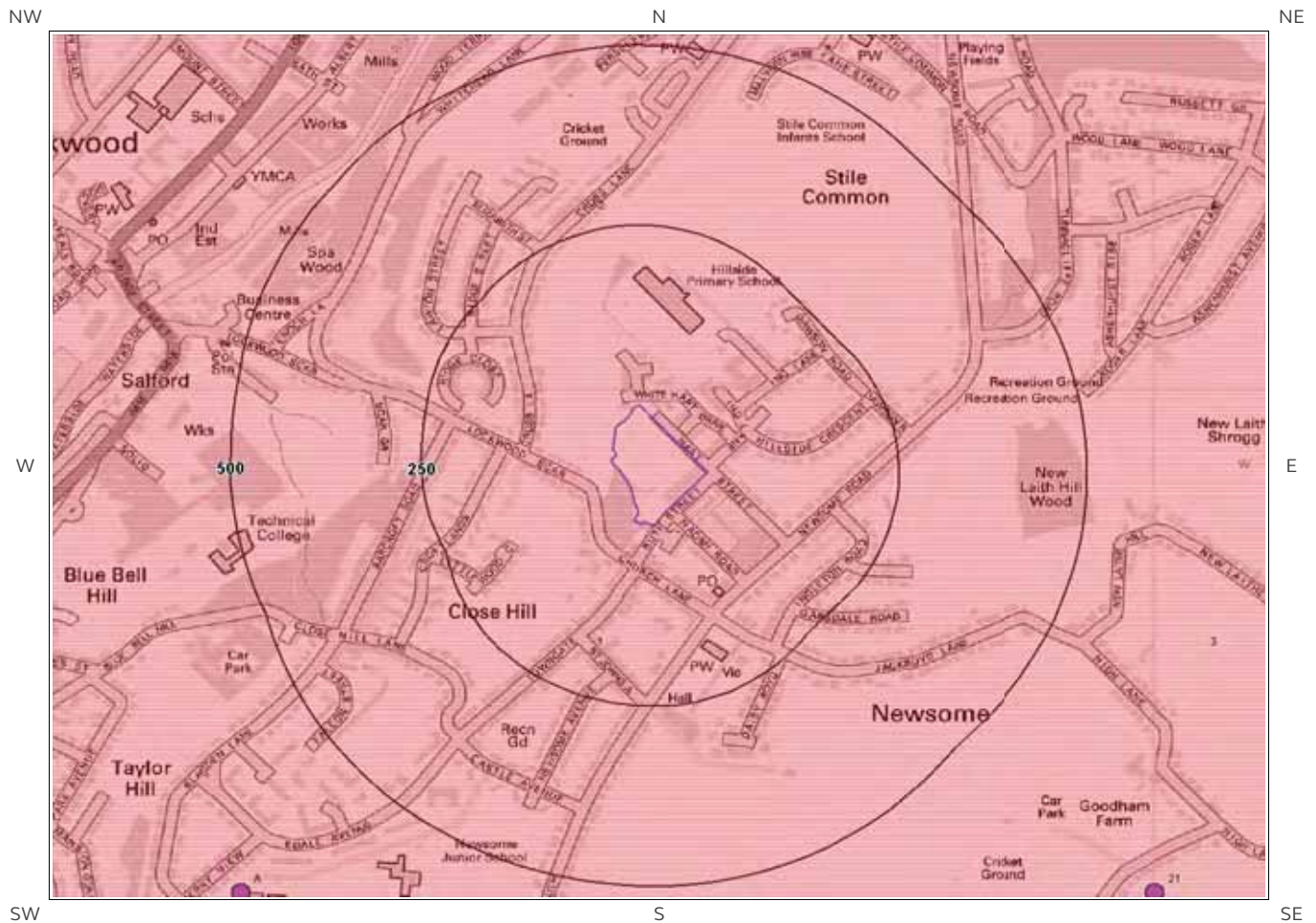
## 6a. Aquifer Within Superficial Geology



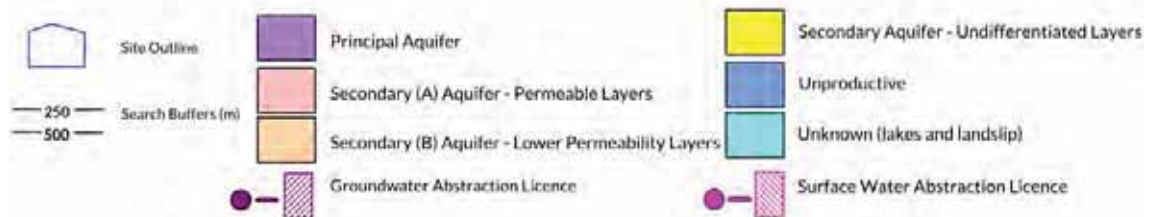
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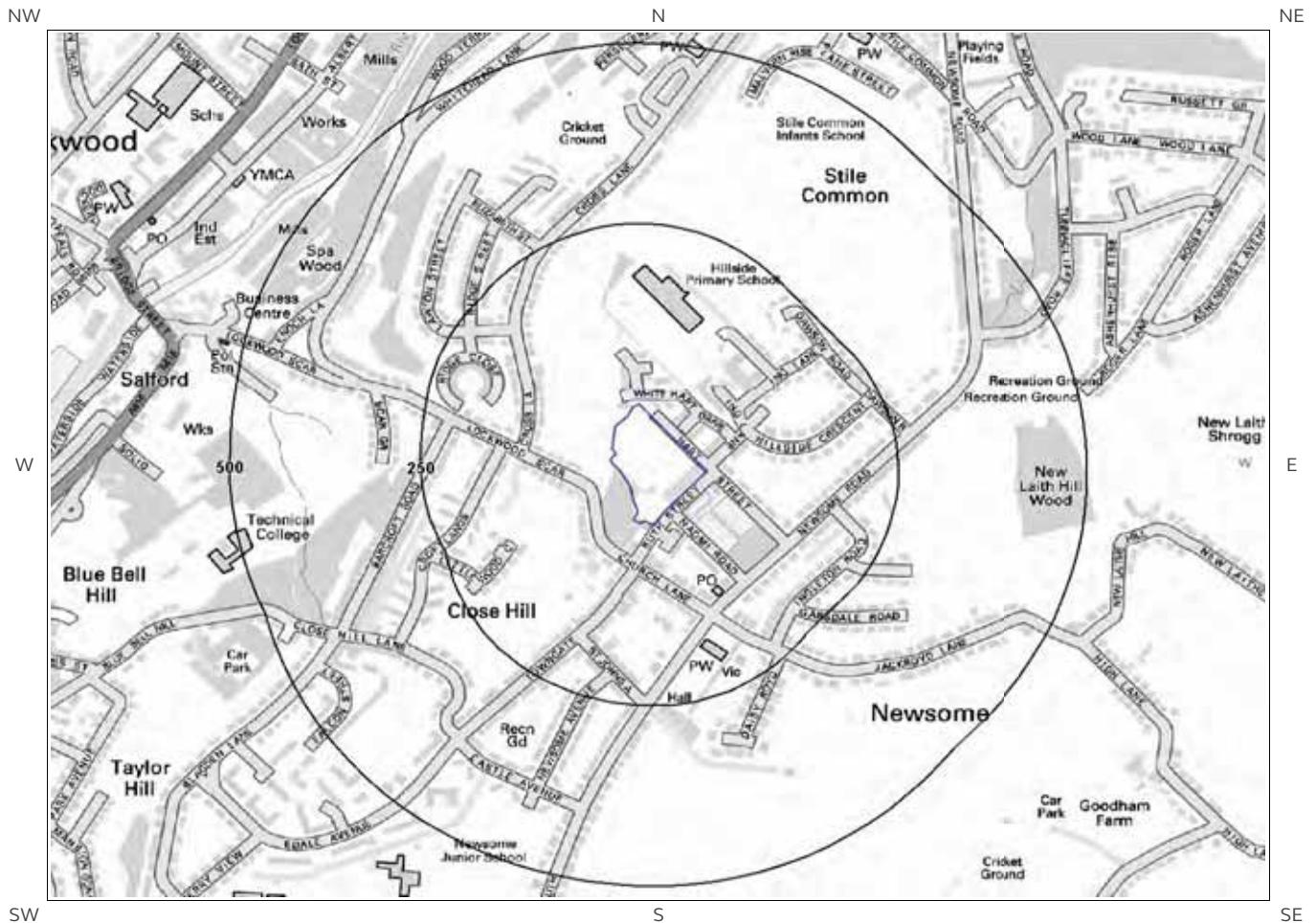
# 6b. Aquifer Within Bedrock Geology and Abstraction Licences



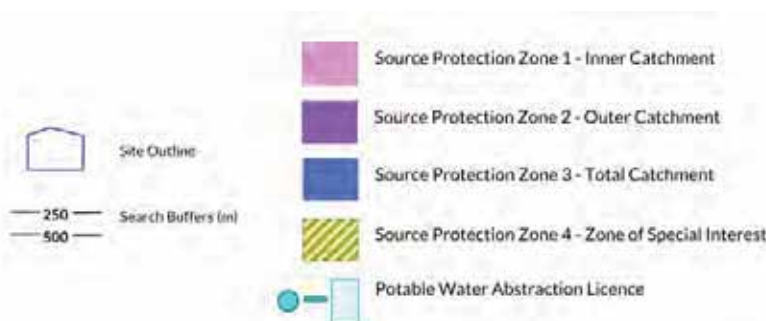
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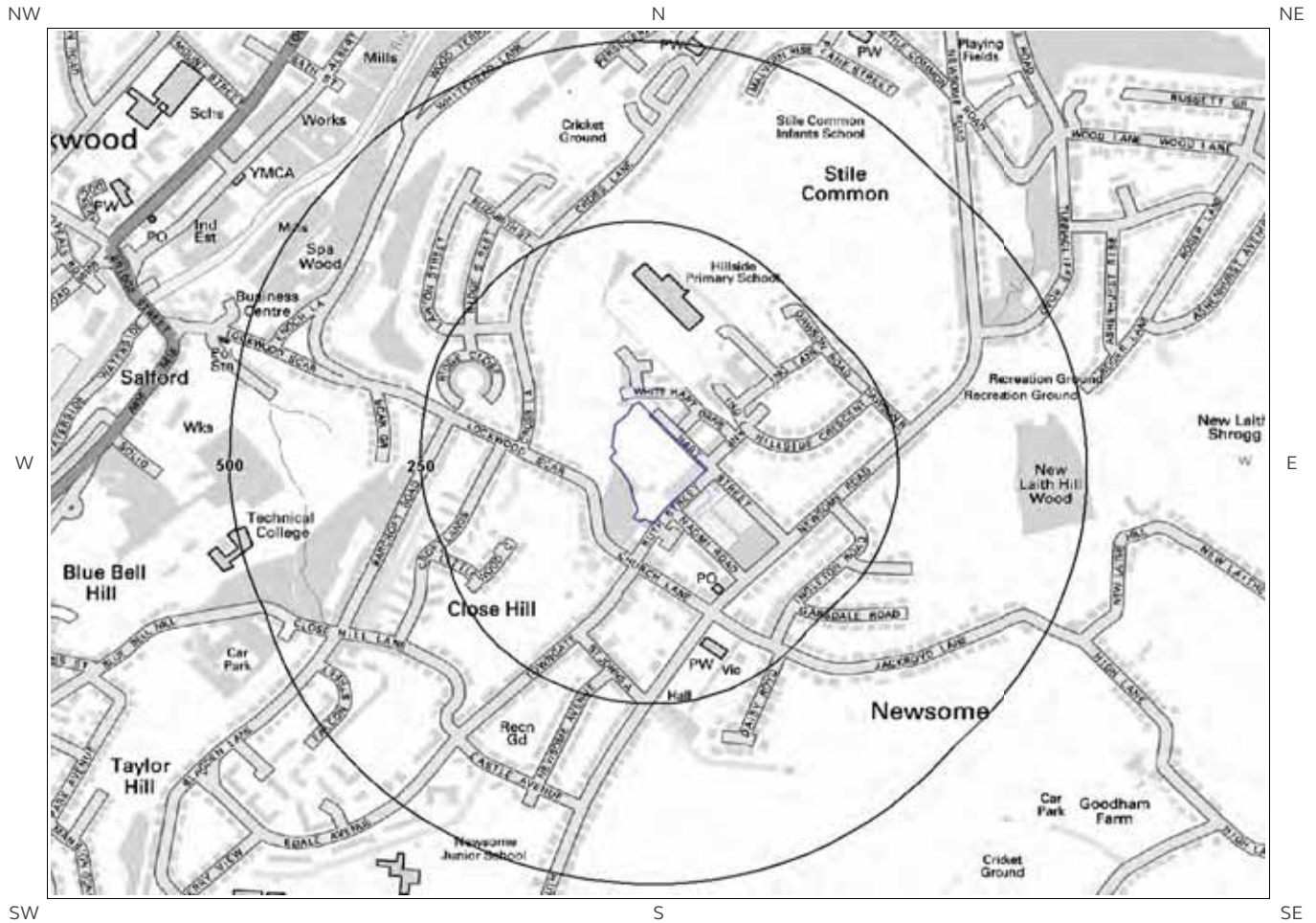
# 6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences



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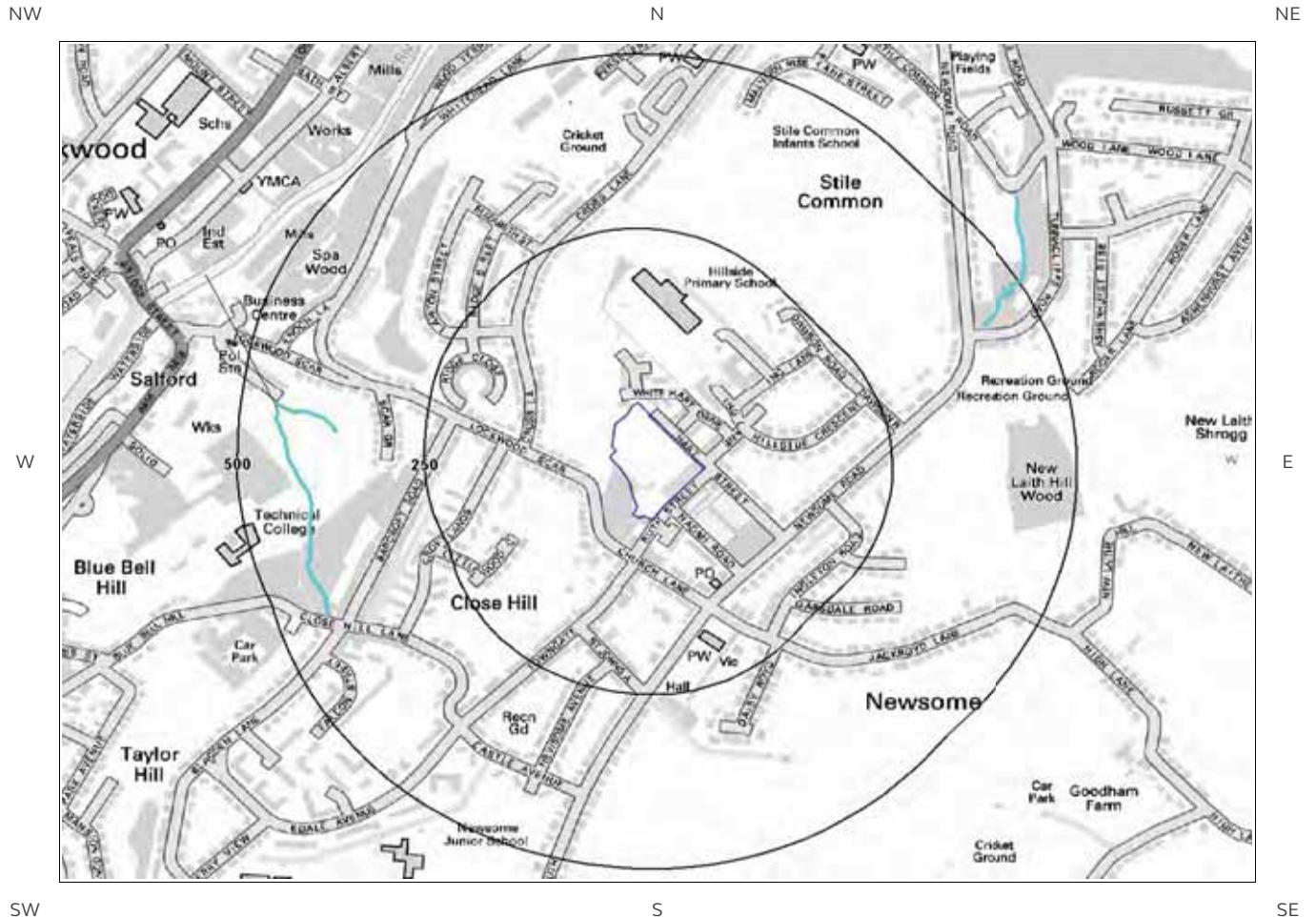
# 6d. Hydrogeology – Source Protection Zones within confined aquifer



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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 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 Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	460	NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

## 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	23	N	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
Not shown	886	W	413400 414900	Status: Historical Licence No: 2/27/10/008 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: BASS BREWERS (TADCASTER) Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 01/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 08/07/1970 Version End Date:
Not shown	1026	N	414400 416000	Status: Historical Licence No: 2/27/11/176 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - HUDDERSFIELD Data Type: Point Name: SKA TEXTILES LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/08/1995 Expiry Date: - Issue No: 101 Version Start Date: 08/02/2001 Version End Date:
Not shown	1060	N	414600 416000	Status: Historical Licence No: 2/27/11/176 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: SKA TEXTILES LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/08/1995 Expiry Date: - Issue No: 101 Version Start Date: 08/02/2001 Version End Date:
Not shown	1060	N	414600 416000	Status: Historical Licence No: 2/27/11/176 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - HUDDERSFIELD Data Type: Point Name: SKA TEXTILES LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/08/1995 Expiry Date: - Issue No: 101 Version Start Date: 08/02/2001 Version End Date:
Not shown	1183	NW	413794 416036	Status: Historical Licence No: NE/027/0011/006 Details: Process Water Direct Source: GROUNDWATERS Point: BOREHOLE-MILLSTONE GRIT-HUDDERSFIELD Data Type: Point Name: SKA TEXTILES LTD Annual Volume (m³): 200000 Max Daily Volume (m³): 1272 Original Application No: - Original Start Date: 06/01/2011 Expiry Date: 31/03/2027 Issue No: 1 Version Start Date: 06/01/2011 Version End Date:
Not shown	1235	NW	413830 416110	Status: Historical Licence No: 2/27/11/190 Details: Process Water Direct Source: GROUNDWATERS Point: BOREHOLE-MILLSTONE GRIT-HUDDERSFIELD Data Type: Point Name: SKA TEXTILES LTD Annual Volume (m³): 465000 Max Daily Volume (m³): 1272 Original Application No: - Original Start Date: 04/02/2005 Expiry Date: 31/12/2010 Issue No: 2 Version Start Date: 18/04/2006 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1473	W	412900 414400	Status: Active Licence No: 2/27/10/069 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLES X2 - MILLSTONE GRIT - LOCKWOOD Data Type: Point Name: Park Valley Huddersfield Ltd	Annual Volume (m³): 454600 Max Daily Volume (m³): 1818 Original Application No: - Original Start Date: 17/03/1966 Expiry Date: - Issue No: 105 Version Start Date: 23/05/2018 Version End Date:
Not shown	1473	W	412900 414400	Status: Active Licence No: 2/27/10/069 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLES X2 - MILLSTONE GRIT - LOCKWOOD Data Type: Point Name: Park Valley Huddersfield Ltd	Annual Volume (m³): 454600 Max Daily Volume (m³): 1818 Original Application No: - Original Start Date: 17/03/1966 Expiry Date: - Issue No: 105 Version Start Date: 23/05/2018 Version End Date:
Not shown	1841	NE	415700 416200	Status: Active Licence No: 2/27/11/018 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - MOLDGREEN Data Type: Point Name: W T JOHNSON & SONS (HUDDERSFIELD) LTD	Annual Volume (m³): 105854 Max Daily Volume (m³): 390.956 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
Not shown	1841	NE	415700 416200	Status: Historical Licence No: 2/27/11/031 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - MILLSTONE GRIT - MOLDGREEN Data Type: Point Name: W T JOHNSON & SONS (HUDDERSFIELD) LTD	Annual Volume (m³): 36754 Max Daily Volume (m³): 136.38 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
Not shown	1841	NE	415700 416200	Status: Historical Licence No: 2/27/11/018 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: W T JOHNSON & SONS (HUDDERSFIELD) LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
Not shown	1841	NE	415700 416200	Status: Historical Licence No: 2/27/11/031 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: W T JOHNSON & SONS (HUDDERSFIELD) LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:
Not shown	1841	NE	415700 416200	Status: Historical Licence No: 2/27/11/018 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - MILLSTONE GRIT - MOLDGREEN Data Type: Point Name: W T JOHNSON & SONS (HUDDERSFIELD) LTD	Annual Volume (m³): 105854 Max Daily Volume (m³): 390.956 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1841	NE	415700 416200	Status: Active Licence No: 2/27/11/031 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - MOLDGREEN Data Type: Point Name: W T JOHNSON & SONS (HUDDERSFIELD) LTD Annual Volume (m³): 36754 Max Daily Volume (m³): 136.38 Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 14/12/1965 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
19A	730	SW	413800 414300	Status: Historical Licence No: 2/27/10/029 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: HEBBLE DYKE Data Type: Point Name: DUNSLEY ENGINEERS LTD Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 29/06/1988 Version End Date:
20A	730	SW	413800 414300	Status: Historical Licence No: 2/27/10/029 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: HEBBLE DYKE Data Type: Point Name: DUNSLEY ENGINEERS LTD Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 29/06/1988 Version End Date:
21	828	SE	415000 414300	Status: Historical Licence No: 2/27/10/041 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: SPRING - NEWSOME Data Type: Point Name: HUDDERSFIELD ESTATE CO LTD Annual Volume (m³): 2950 Max Daily Volume (m³): 86.83 Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/09/1984 Version End Date:
Not shown	832	N	414200 415800	Status: Historical Licence No: 2/27/10/009 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER HOLME Data Type: Point Name: TAYLOR & LODGE LTD Annual Volume (m³): 54552 Max Daily Volume (m³): 327.312 Application No: - Original Start Date: 01/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 01/12/1965 Version End Date:
Not shown	832	N	414200 415800	Status: Historical Licence No: 2/27/10/009 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: RIVER HOLME - HUDDERSFIELD Data Type: Point Name: TAYLOR & LODGE LTD Annual Volume (m³): 54552 Max Daily Volume (m³): 327.312 Application No: - Original Start Date: 01/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 01/12/1965 Version End Date:
Not	1026	N	414650	Status: Historical
				Annual Volume (m³): -

ID	Distance (m)	Direction	NGR	Details
shown			416010	Licence No: 2/27/11/175 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: SURFACE WATER Point: HUDDERSFIELD NARROW CANAL Data Type: Line Name: BRITISH WATERWAYS BOARD Max Daily Volume (m³): - Application No: - Original Start Date: 22/09/1994 Expiry Date: - Issue No: 100 Version Start Date: 22/09/1994 Version End Date:
Not shown	1083	N	414650 416010	Status: Historical Licence No: 2/27/11/175 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: SURFACE WATER Point: HUDDERSFIELD NARROW CANAL Data Type: Line Name: BRITISH WATERWAYS BOARD Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 22/09/1994 Expiry Date: - Issue No: 101 Version Start Date: 10/03/2003 Version End Date:
Not shown	1119	N	414179 416087	Status: Active Licence No: NE/027/0011/011 Details: Non-Evaporative Cooling Direct Source: SURFACE WATER Point: HUDDERSFIELD NARROW CANAL Data Type: Point Name: Canal and River Trust Annual Volume (m³): 1.6848e+006 Max Daily Volume (m³): 7560 Application No: - Original Start Date: 24/04/2012 Expiry Date: 31/03/2027 Issue No: 1 Version Start Date: 24/04/2012 Version End Date:
Not shown	1157	W	413200 414500	Status: Historical Licence No: 2/27/10/121 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: RIVER HOLME Data Type: Point Name: HUDDERSFIELD RUGBY UNION FOOTBALL CLUB Annual Volume (m³): 7208 Max Daily Volume (m³): 136 Application No: - Original Start Date: 27/03/1997 Expiry Date: 31/10/2006 Issue No: 101 Version Start Date: 11/01/2000 Version End Date:
Not shown	1157	W	413200 414500	Status: Historical Licence No: 2/27/10/126 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: RIVER HOLME Data Type: Point Name: HUDDERSFIELD RUGBY UNION FOOTBALL CLUB Annual Volume (m³): 4800 Max Daily Volume (m³): 136 Application No: - Original Start Date: 01/01/2007 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: 01/01/2007 Version End Date:
Not shown	1157	W	413200 414500	Status: Historical Licence No: 2/27/10/126 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: RIVER HOLME - LOCKWOOD Data Type: Point Name: HUDDERSFIELD RUGBY UNION FOOTBALL CLUB Annual Volume (m³): 4800 Max Daily Volume (m³): 136 Application No: - Original Start Date: 01/01/2007 Expiry Date: 31/03/2015 Issue No: 1 Version Start Date: 01/01/2007 Version End Date:
Not shown	1162	N	414690 416080	Status: Active Licence No: 2/27/11/175 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: SURFACE WATER Point: HUDDERSFIELD NARROW CANAL Data Type: Line Name: Canal and River Trust Annual Volume (m³): 1.25e+006 Max Daily Volume (m³): 3960 Application No: - Original Start Date: 22/09/1994 Expiry Date: - Issue No: 103 Version Start Date: 21/01/2008 Version End Date:
Not shown	1203	W	413120 414600	Status: Active Licence No: 2/27/10/126/R01 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: RIVER HOLME - LOCKWOOD Data Type: Point Name: HUDDERSFIELD RUGBY UNION FOOTBALL CLUB LTD Annual Volume (m³): 4800 Max Daily Volume (m³): 136 Application No: - Original Start Date: 01/04/2015 Expiry Date: 31/03/2027 Issue No: 1 Version Start Date: 01/04/2015 Version End Date:
Not shown	1487	N	414870 416360	Status: Active Licence No: 2/27/11/160 Annual Volume (m³): 700000 Max Daily Volume (m³): 3600

ID	Distance (m)	Direction	NGR	Details	
				Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: SURFACE WATER Point: HUDDERSFIELD CANAL Data Type: Point Name: Canal and River Trust	Application No: - Original Start Date: 01/03/1974 Expiry Date: - Issue No: 102 Version Start Date: 21/01/2008 Version End Date:
Not shown	1501	N	414800 416400	Status: Historical Licence No: 2/27/11/160 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: SURFACE WATER Point: HUDDERSFIELD CANAL Data Type: Point Name: BRITISH WATERWAYS BOARD	Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 01/03/1974 Expiry Date: - Issue No: 100 Version Start Date: 17/11/1993 Version End Date:
Not shown	1509	SW	413000 413800	Status: Historical Licence No: 2/27/10/089 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: DEAN CLOUGH Data Type: Line Name: JOHN BROOKE & SONS HOLDINGS LTD	Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/07/1982 Version End Date:
Not shown	1509	SW	413000 413800	Status: Historical Licence No: 2/27/10/089 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: DEAN CLOUGH Data Type: Line Name: JOHN BROOKE & SONS HOLDINGS LTD	Annual Volume (m³): 17638 Max Daily Volume (m³): 76.1 Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/07/1982 Version End Date:
Not shown	1509	SW	413000 413800	Status: Historical Licence No: 2/27/10/089 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: SURFACE WATER Point: DEAN CLOUGH Data Type: Line Name: JOHN BROOKE & SONS HOLDINGS LTD	Annual Volume (m³): 17638 Max Daily Volume (m³): 76.1 Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/07/1982 Version End Date:
Not shown	1509	SW	413000 413800	Status: Historical Licence No: 2/27/10/089 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: SURFACE WATER Point: DEAN CLOUGH - HUDDERSFIELD Data Type: Line Name: JOHN BROOKE & SONS HOLDINGS LTD	Annual Volume (m³): 17638 Max Daily Volume (m³): 76.1 Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/07/1982 Version End Date:
Not shown	1509	SW	413000 413800	Status: Historical Licence No: 2/27/10/089 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: DEAN CLOUGH - HUDDERSFIELD Data Type: Line Name: JOHN BROOKE & SONS HOLDINGS LTD	Annual Volume (m³): 17638 Max Daily Volume (m³): 76.1 Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 27/07/1982 Version End Date:
Not shown	1826	NW	412800 416000	Status: Historical Licence No: 2/27/11/148 Details: General use relating to Secondary Category (Low Loss) Direct Source: SURFACE WATER Point: HUDDERSFIELD CANAL Data Type: Point Name: BRITISH WATERWAYS BOARD	Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 26/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 08/10/1979 Version End Date:
Not	1900	SW	413500	Status: Historical	Annual Volume (m³): 18184000

ID	Distance (m)	Direction	NGR	Details
shown			413100	Licence No: 2/27/10/088 Details: Milling & Water Power Other Than Electricity Generation Direct Source: SURFACE WATER Point: RIVER HOLME Data Type: Point Name: JOHN BROOKE & SONS HOLDINGS LTD Max Daily Volume (m³): 181840 Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 13/11/1989 Version End Date:
Not shown	1900	SW	413500 413100	Status: Active Licence No: 2/27/10/088 Details: Milling & Water Power Other Than Electricity Generation Direct Source: SURFACE WATER Point: RIVER HOLME - HUDDERSFIELD Data Type: Point Name: JOHN BROOKE & SONS HOLDINGS LTD Annual Volume (m³): 1.8184e+007 Max Daily Volume (m³): 181840 Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 13/11/1989 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
Not shown	1473	W	412900 414400	Status: Active Licence No: 2/27/10/069 Details: Water Bottling Direct Source: GROUNDWATERS Point: BOREHOLES X2 - MILLSTONE GRIT - LOCKWOOD Data Type: Point Name: Park Valley Huddersfield Ltd Annual Volume (m³): 454600 Max Daily Volume (m³): 1818 Original Application No: - Original Start Date: 17/03/1966 Expiry Date: - Issue No: 105 Version Start Date: Version End Date:
Not shown	1509	SW	413000 413800	Status: Historical Licence No: 2/27/10/089 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: SURFACE WATER Point: DEAN CLOUGH Data Type: Line Name: JOHN BROOKE & SONS HOLDINGS LTD Annual Volume (m³): 17638 Max Daily Volume (m³): 76.1 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:
Not shown	1509	SW	413000 413800	Status: Historical Licence No: 2/27/10/089 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: SURFACE WATER Point: DEAN CLOUGH - HUDDERSFIELD Data Type: Line Name: JOHN BROOKE & SONS HOLDINGS LTD Annual Volume (m³): 17638 Max Daily Volume (m³): 76.1 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

## 6.6 Source Protection Zones

Source Protection Zones within 500m of the study site

None identified

Database searched and no data found.

## 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.
285	SE	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	823	N	414300 415800	River Name: Holme Reach: Mag Brook River Colne End/Start of Stretch: End 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 (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

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

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
Not shown	776	N	414194 415742	River Name: River Holme/ramsden Cloug Reach: Mag Brook River Colne End/Start of Stretch: Sample Point NGR	B	B	B	A	A
Not shown	823	N	414300 415800	River Name: River Holme/ramsden Cloug Reach: Mag Brook River Colne End/Start of Stretch: End of Stretch NGR	B	B	B	A	A
Not shown	838	N	414292 415815	River Name: River Colne Reach: Longwood Beck River Holme End/Start of Stretch: End of Stretch NGR	B	A	A	A	A
Not shown	838	N	414292 415815	River Name: River Colne Reach: River Holme Sir John Ramsden Can End/Start of Stretch: Start of Stretch NGR	A	A	A	A	A
Not shown	940	NE	414695 415840	River Name: River Colne Reach: River Holme Sir John Ramsden Can End/Start of Stretch: Sample Point NGR	A	A	A	A	A
Not shown	1398	NE	415000 416200	River Name: River Colne Reach: Sir John Ramsden Canhebble Brook End/Start of Stretch: Start of Stretch NGR	B	B	B	B	A
Not shown	1398	NE	415000 416200	River Name: River Colne Reach: River Holme Sir John Ramsden Can End/Start of Stretch: End 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	368 W	Not Specified	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
18	368 W	Not Specified	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	406 W	Not Specified	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
19	406 W	Not Specified	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
3	426 NE	Not Specified	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
20	426 NE	Not Specified	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	451 W	Not Specified	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	451 W	Not Specified	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	454 W	Not Specified	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
				conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	454 W	Not Specified	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
6	478 NE	Not Specified	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	478 NE	Not Specified	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
7	482 NE	Not Specified	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	482 NE	Not Specified	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

## 6.11 Surface Water Features

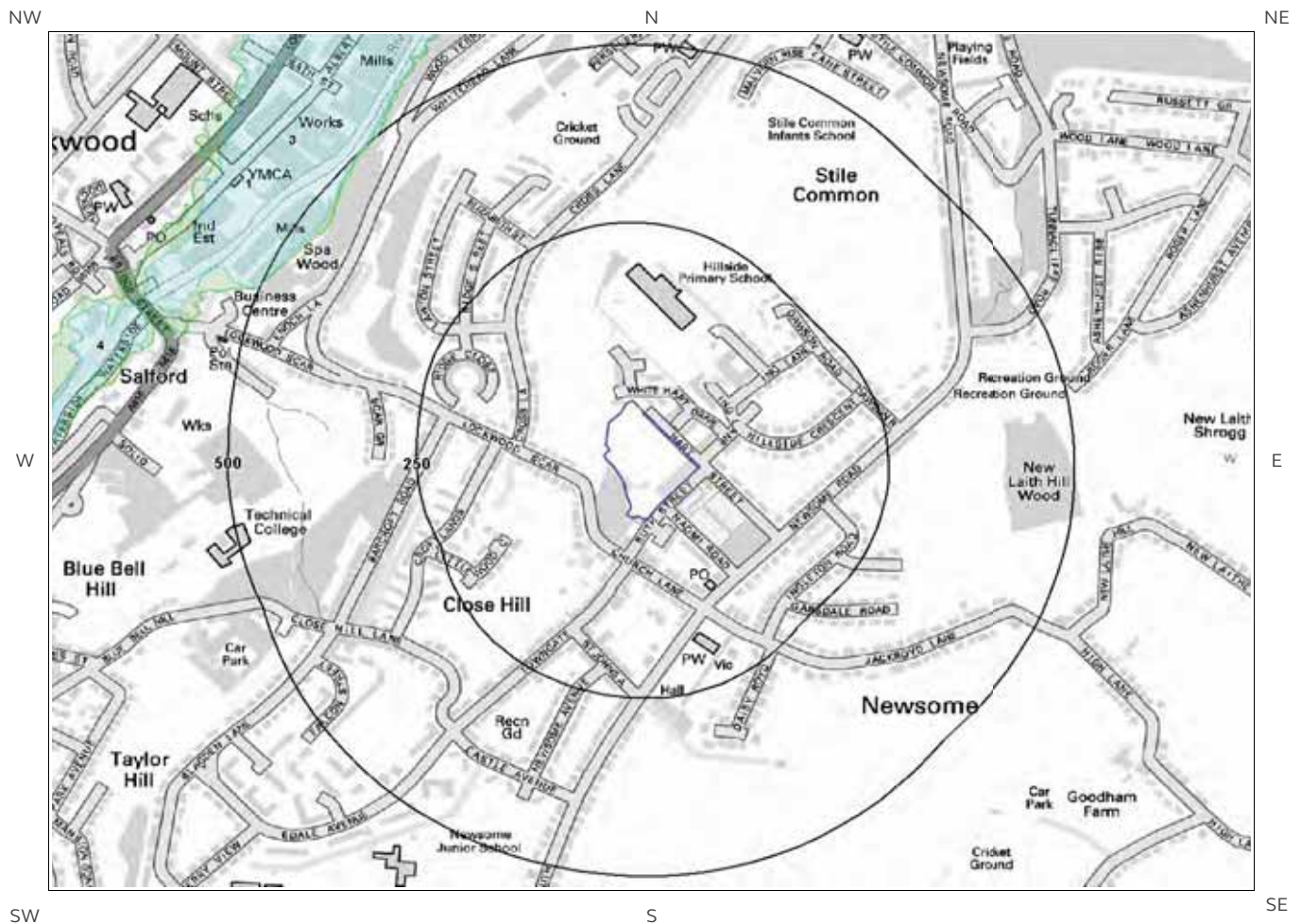
Surface water features within 250m of the study site

Identified

The following surface water records are not represented on mapping:

Distance (m)	Direction
37	SE
40	SE

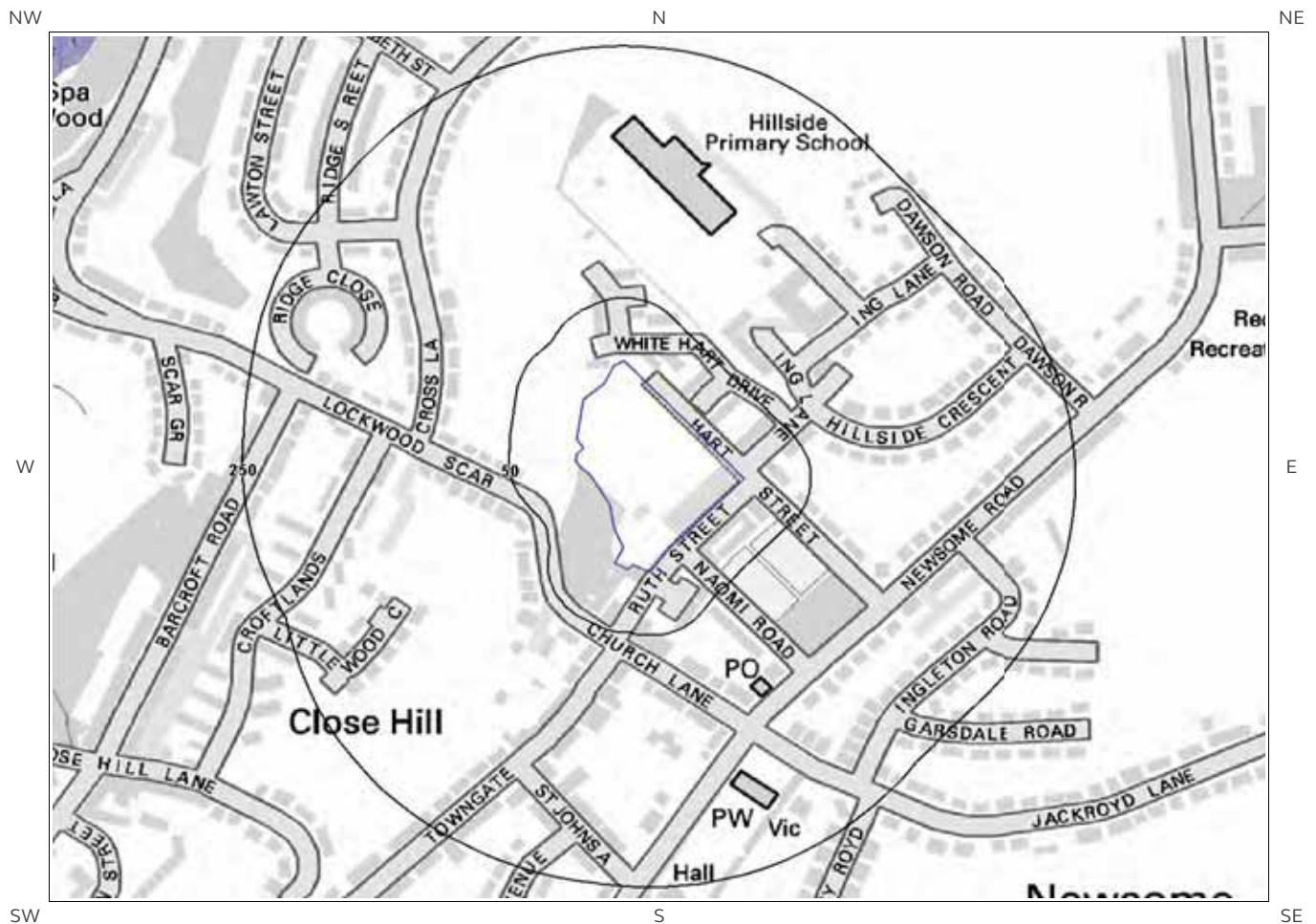
# 7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



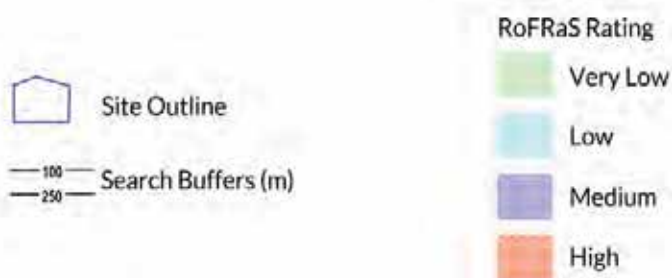
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# 7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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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

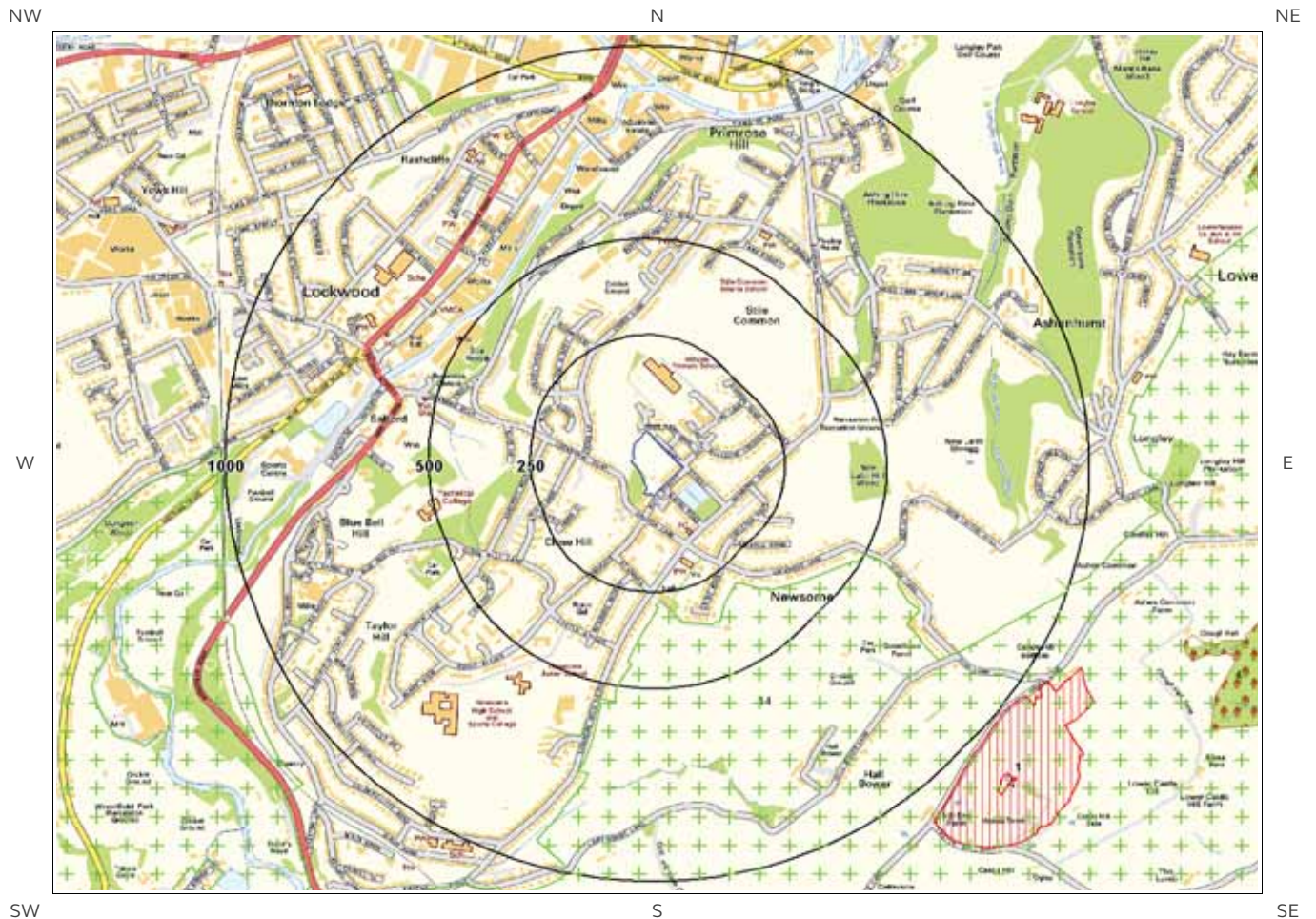
British Geological Survey confidence rating in this result

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:

10

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	1312	E	MELLOR WOOD	Ancient Replanted Woodland
Not shown	1426	S	PARK WOOD	Ancient and Semi-Natural Woodland
Not shown	1535	SE	ROAF WOOD	Ancient and Semi-Natural Woodland
Not shown	1540	SW	MAG WOOD/NAN HOB SPRING	Ancient Replanted Woodland
8	1580	NE	BENHOLMLEY WOOD	Ancient Replanted Woodland
Not shown	1711	SW	DAFFY WOOD	Ancient Replanted Woodland
Not shown	1787	E	BENHOLMLEY WOOD	Ancient Replanted Woodland
Not shown	1821	SE	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1830	SE	ARTHUR WOOD	Ancient and Semi-Natural Woodland
Not shown	1968	SW	BUTTER NAB SPRING	Ancient and Semi-Natural Woodland

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

3

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
1	1015	SE	Castle Hill	Natural England
Not shown	1628	S	Upper Park Wood	Natural England
Not shown	1715	NW	Gledholt Woods	Natural England

## 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:

0

Database searched and no data found.

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

1

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ID	Distance	Direction	Green Belt Name	Local Authority Name
14	271	S	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 Moderate

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

Hazard
Significant potential for slope instability with relatively small changes in ground conditions. Avoid large amounts of water entering the ground through pipe leakage or soak-aways. Do not undercut or place large amounts of material on slopes without technical advice. For new build consider the potential and consequences of ground movement during excavations, or consequence of changes to loading or drainage. For existing property probable increase in insurance risk is likely due to potential natural slope instability after changes to ground conditions such as a very long, excessively wet winter.

### 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 study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

## 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

**British Geological Survey Enquiries**  
Kingsley Dunham Centre  
Keyworth, Nottingham NG12 5GG  
Tel: 0115 936 3143.  
Fax: 0115 936 3276.  
Email:  
Web: [www.bgs.ac.uk](http://www.bgs.ac.uk)

BGS Geological Hazards Reports and general geological enquiries:  
[enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)

**Environment Agency**  
National Customer Contact Centre, PO Box 544  
Rotherham, S60 1BY  
Tel: 03708 506 506  
Web: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)  
Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

**Public Health England**  
Public information access office  
Public Health England, Wellington House  
133-155 Waterloo Road, London, SE1 8UG  
[www.gov.uk/phe](http://www.gov.uk/phe)  
Email: [enquiries@phe.gov.uk](mailto:enquiries@phe.gov.uk)  
Main switchboard: 020 7654 8000

**The Coal Authority**  
200 Lichfield Lane  
Mansfield  
Notts NG18 4RG  
Tel: 0345 7626 848  
DX 716176 Mansfield 5  
[www.coal.gov.uk](http://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 1WG

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



Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.

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#### Site Details:

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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1893

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1893  
Revised 1893  
Edition N/A  
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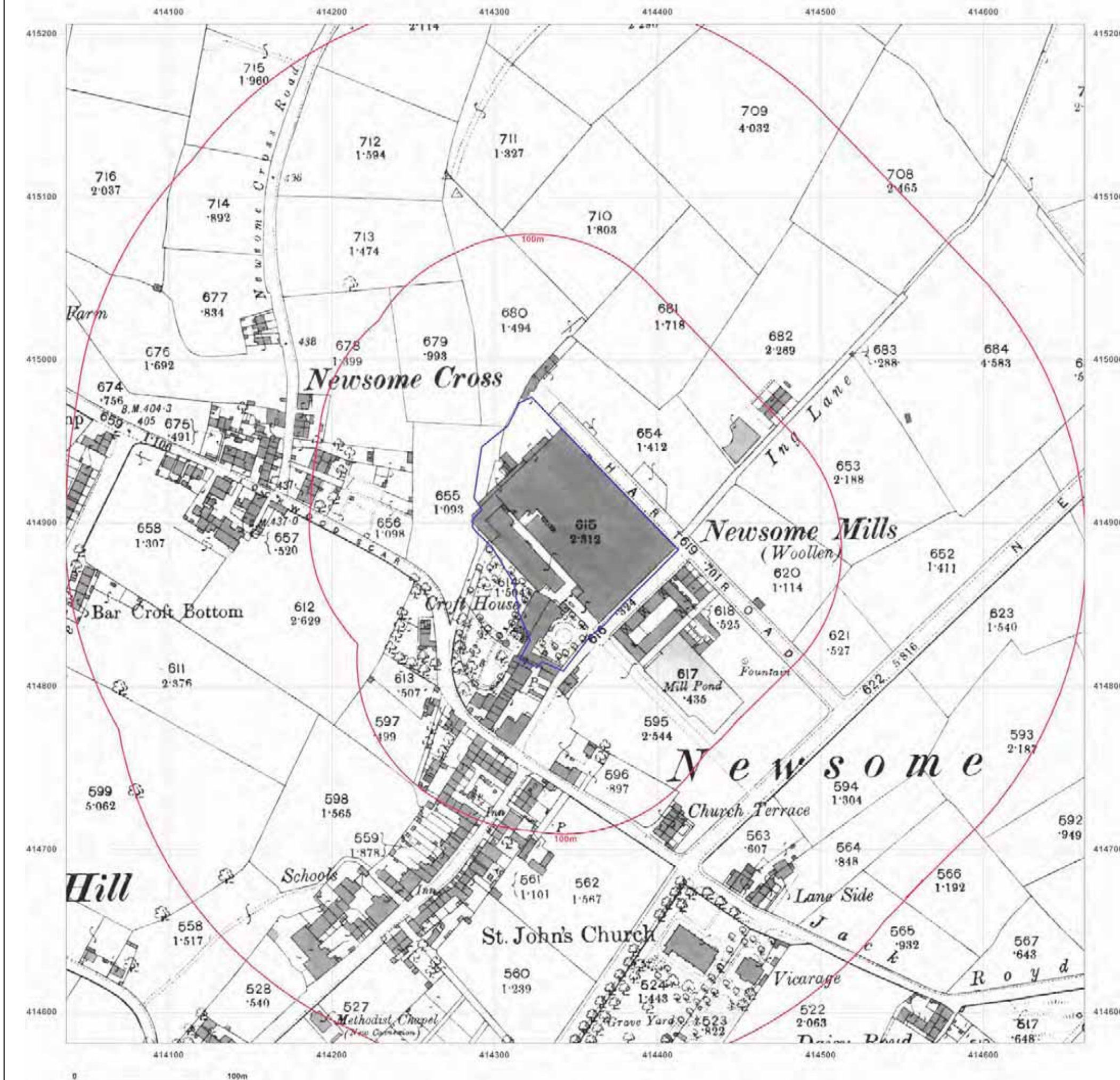


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Groundsure Insights  
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Production date: 29 November 2018

Map legend available at:  
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HUDDERSFIELD, HD4 6JF

**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1906

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1906  
Revised 1906  
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Client Ref: PANORAMA\_LIVING\_7413  
Report Ref: GS-5658353  
Grid Ref: 414349, 414893

Map Name: County Series

Map date: 1913

Scale: 1:2,500

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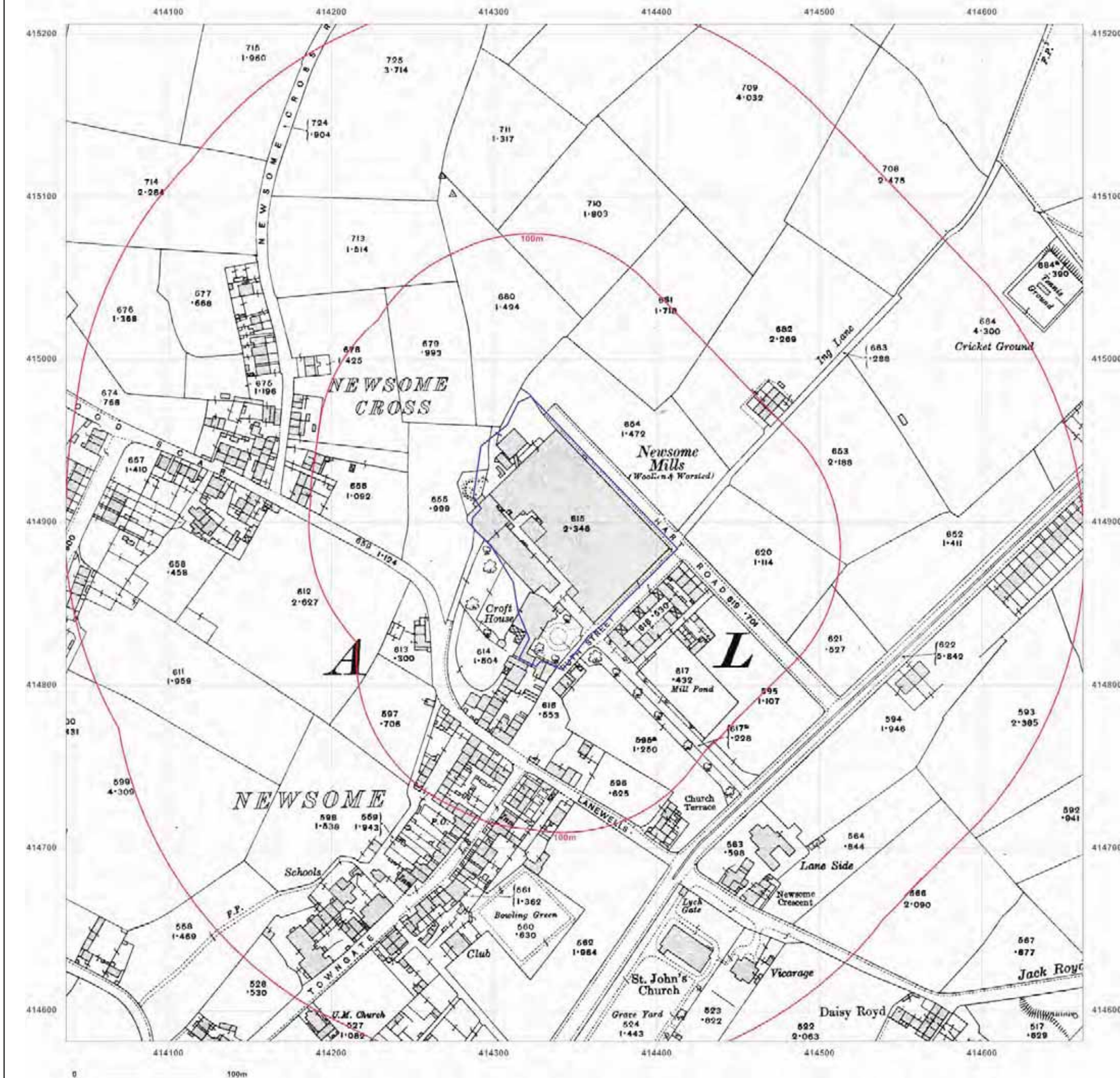


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#### Site Details:

RUTH STREET, NEWSOME,  
HUDDERSFIELD, HD4 6JF

**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** National Grid

**Map date:** 1958

**Scale:** 1:2,500

**Printed at:** 1:2,500



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Surveyed 1958  
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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** National Grid

**Map date:** 1959

**Scale:** 1:1,250

**Printed at:** 1:2,000



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Edition N/A  
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Revised 1958  
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Revised 1958  
Edition N/A  
Copyright 1959  
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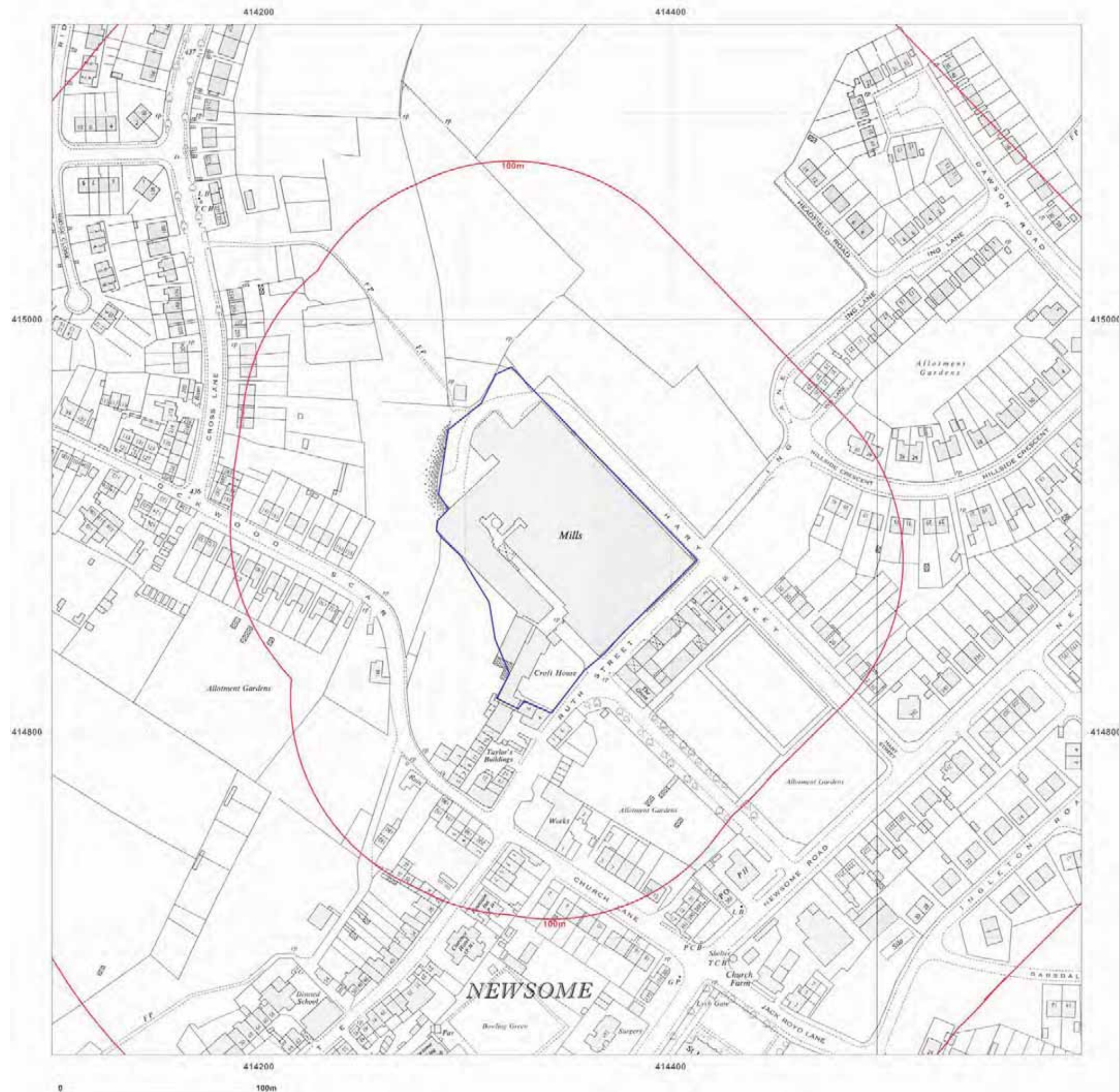


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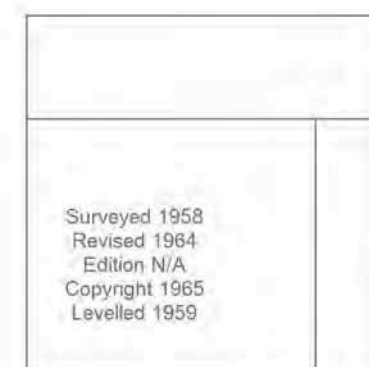
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**Grid Ref:** 414349, 414893

**Map Name:** National Grid

**Map date:** 1965-1966

**Scale:** 1:1,250

**Printed at:** 1:2,000



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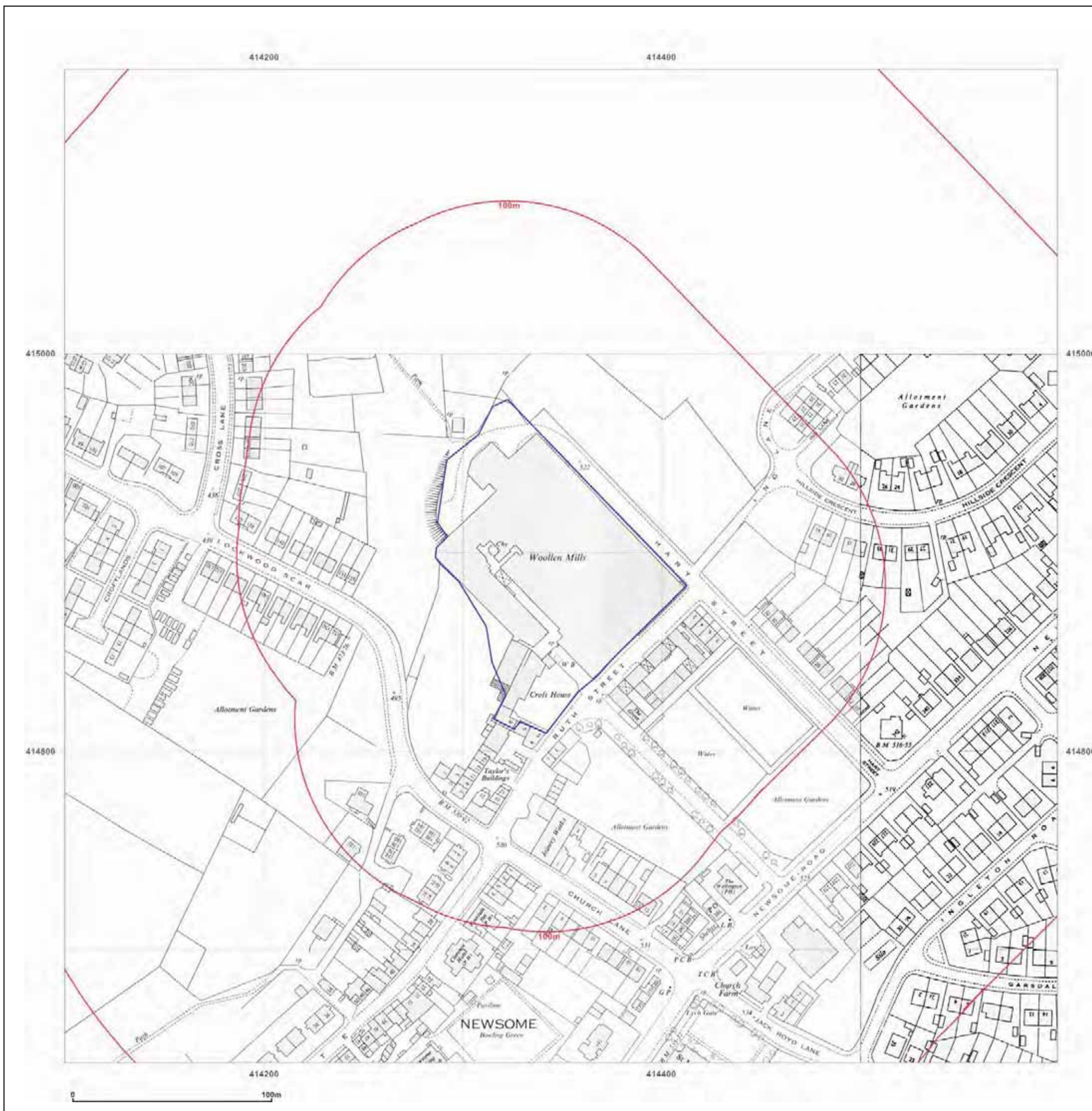


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** National Grid

**Map date:** 1967-1972

**Scale:** 1:1,250

**Printed at:** 1:2,000



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Revised N/A  
Edition N/A  
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Surveyed 1958  
Revised 1969  
Edition N/A  
Copyright 1970  
Levelled 1959

Surveyed 1958  
Revised 1966  
Edition N/A  
Copyright 1967  
Levelled 1959

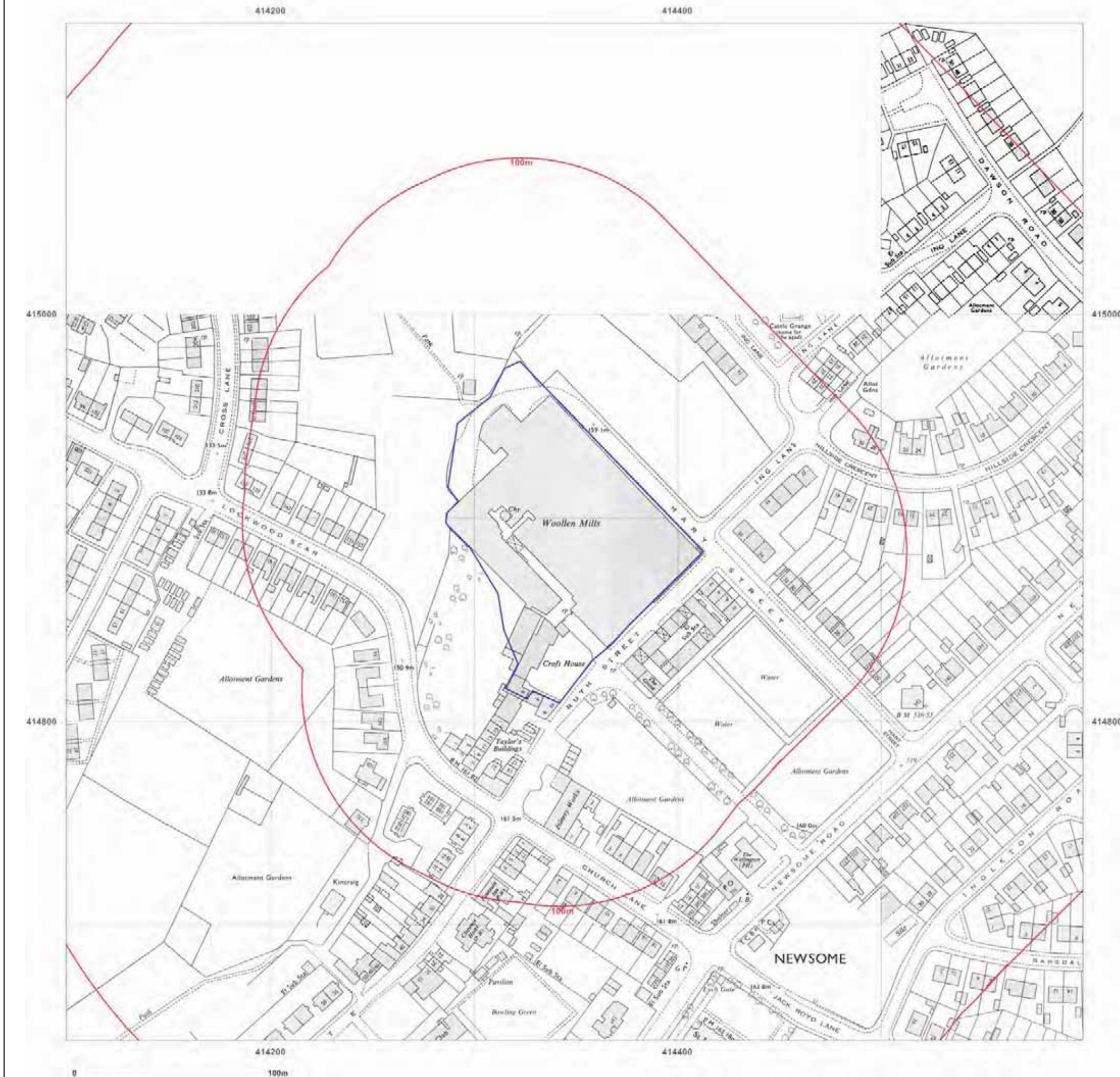


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** National Grid

**Map date:** 1990-1993

**Scale:** 1:1,250

**Printed at:** 1:2,000



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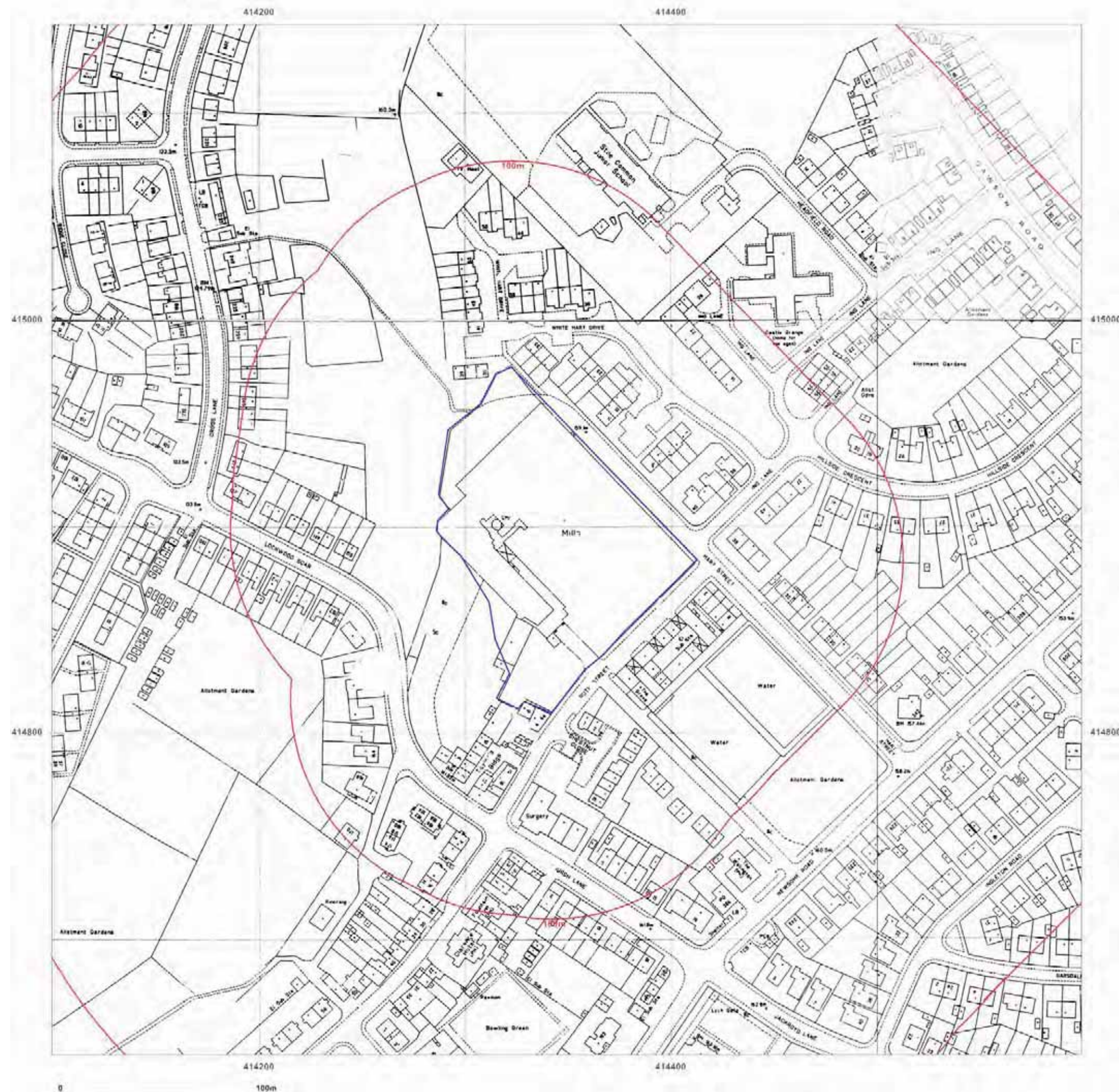


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1854

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1850  
Revised N/A  
Edition 1854  
Copyright N/A  
Levelled 1853

Surveyed 1851  
Revised N/A  
Edition 1854  
Copyright N/A  
Levelled N/A

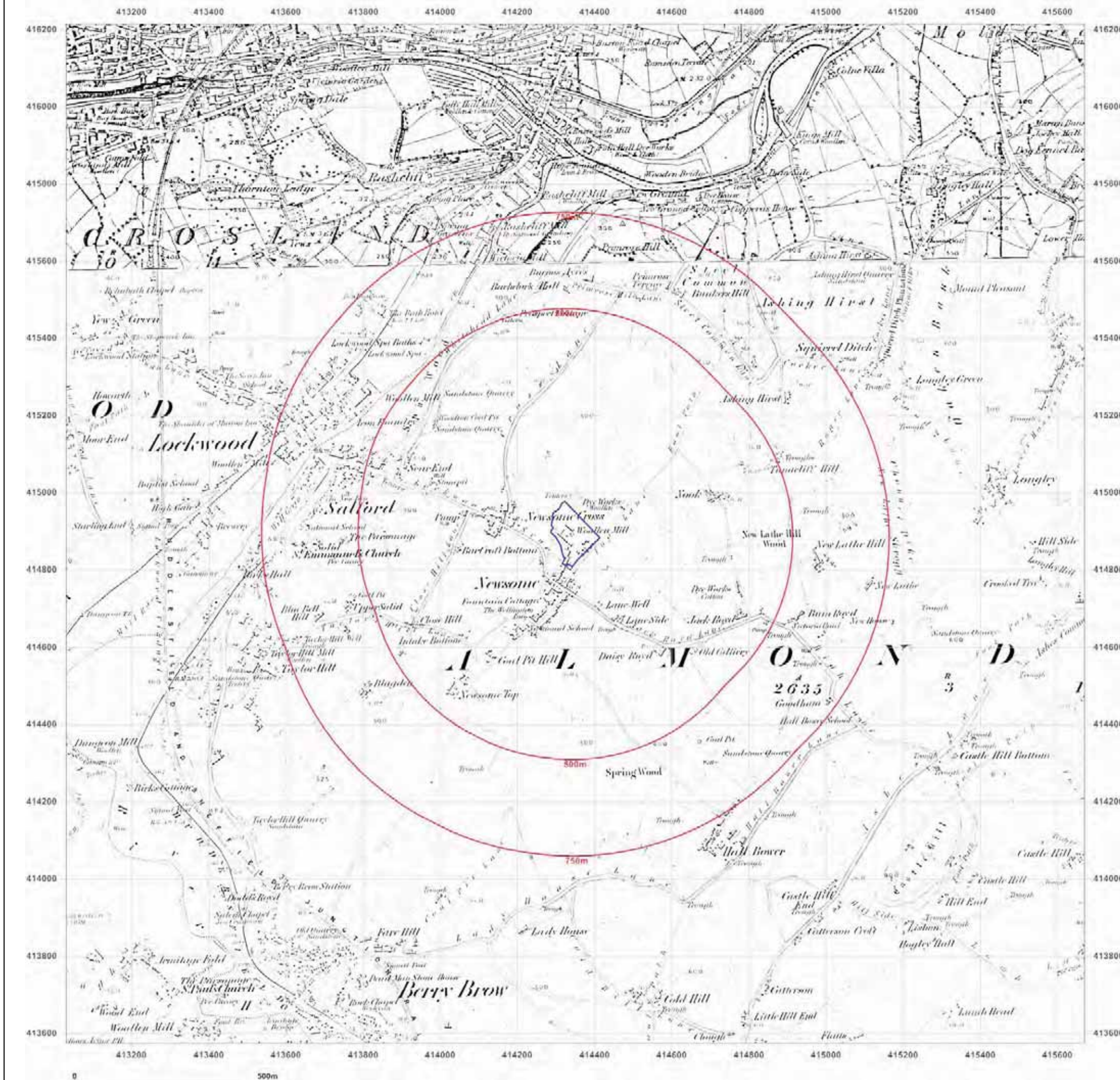


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1888-1891

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1889  
Revised 1889  
Edition N/A  
Copyright N/A  
Levelled N/A

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

Surveyed 1888  
Revised 1888  
Edition N/A  
Copyright N/A  
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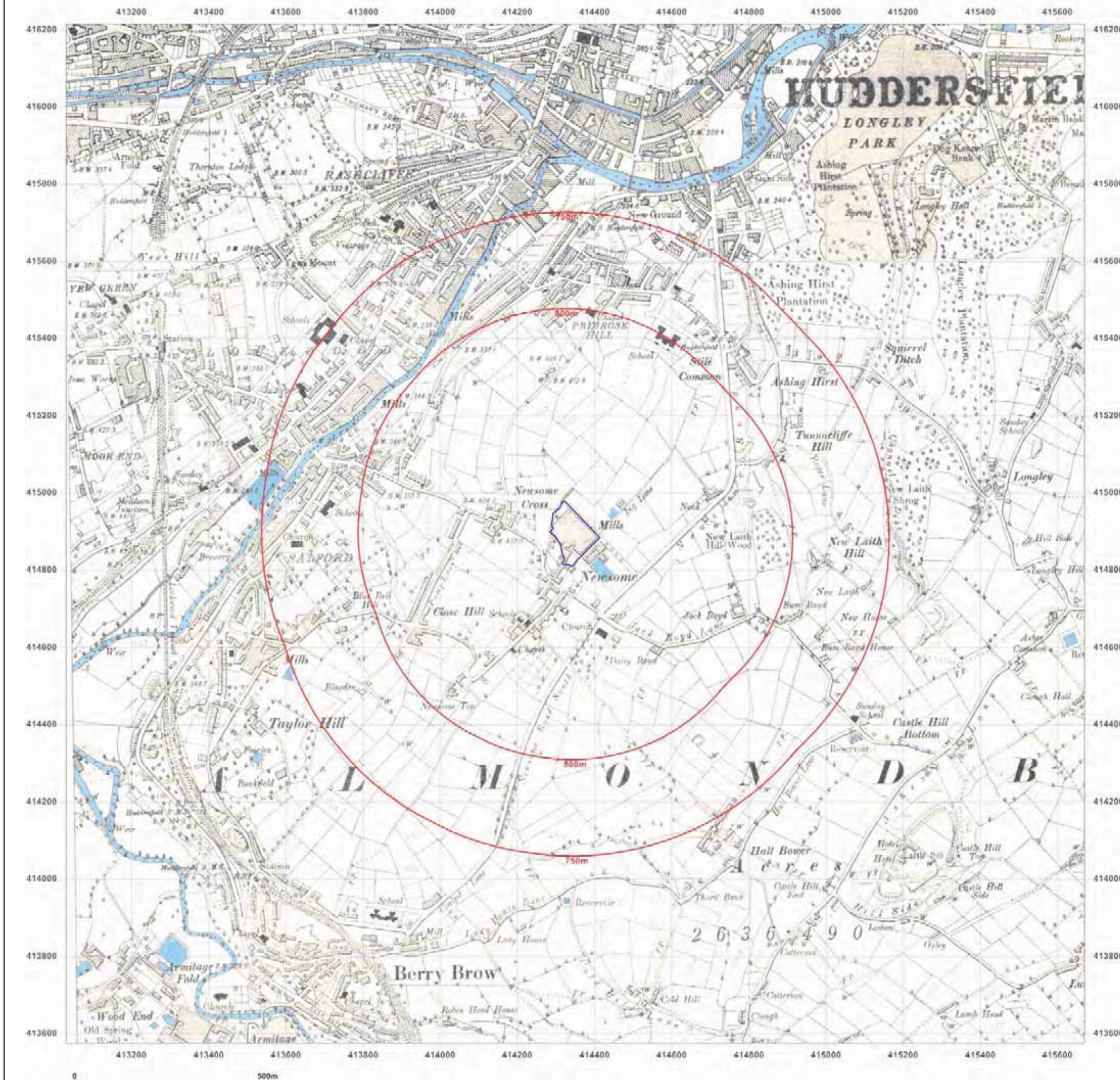


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1905

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1888  
Revised 1905  
Edition N/A  
Copyright N/A  
Levelled N/A

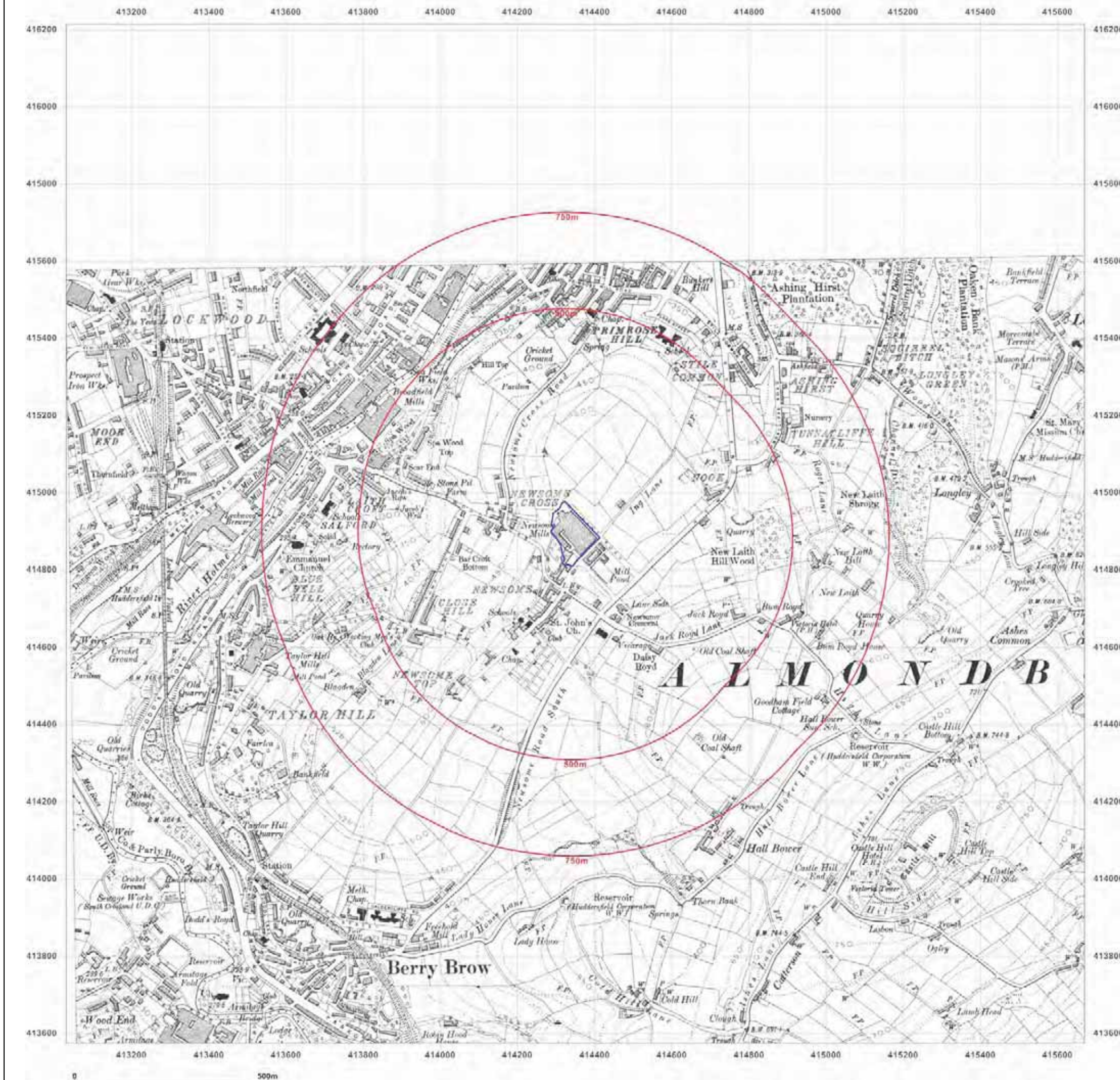


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1930

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1851  
Revised 1930  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1851  
Revised 1930  
Edition N/A  
Copyright N/A  
Levelled N/A

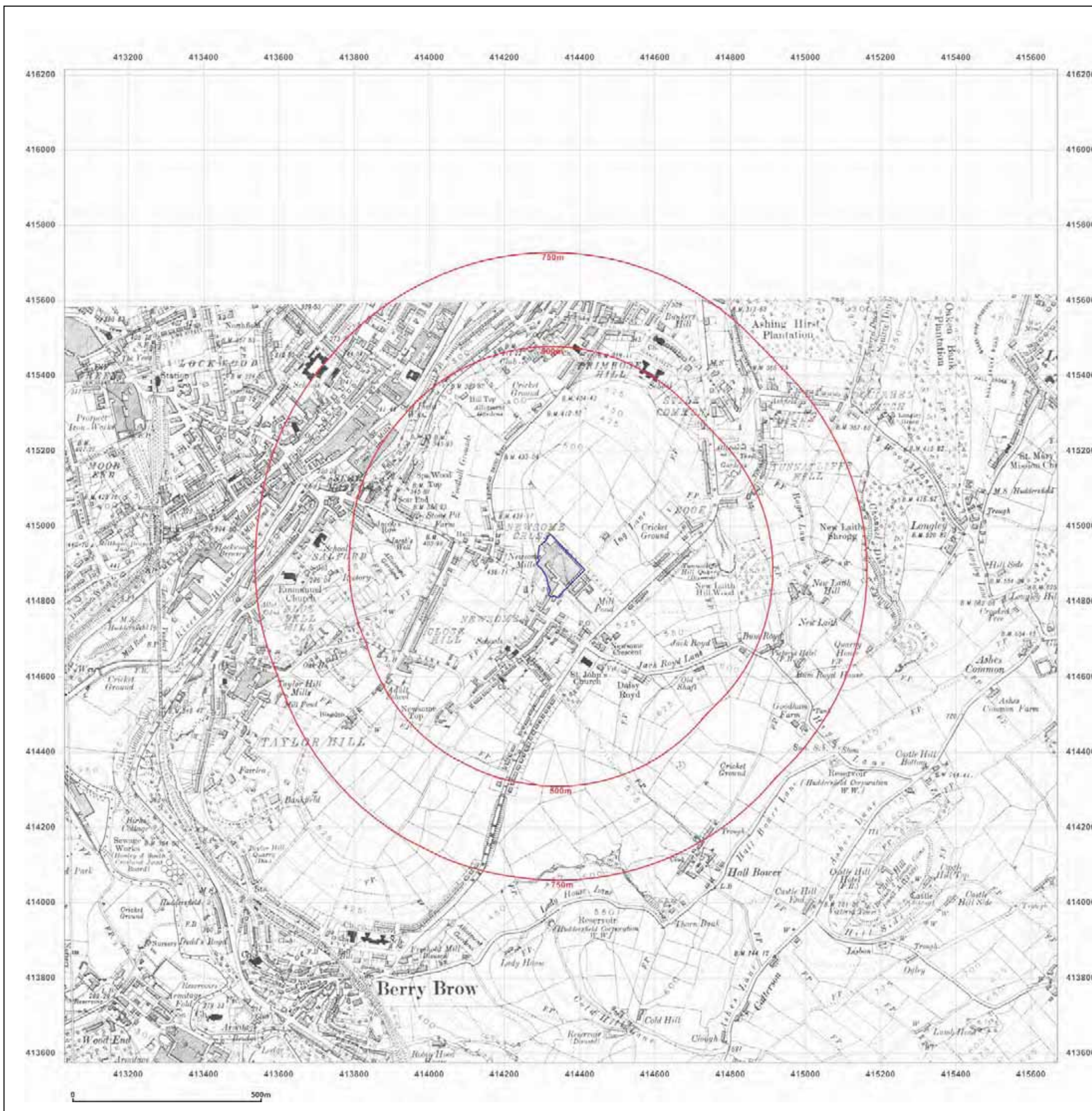


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1938

**Scale:** 1:10,560

**Printed at:** 1:10,560



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

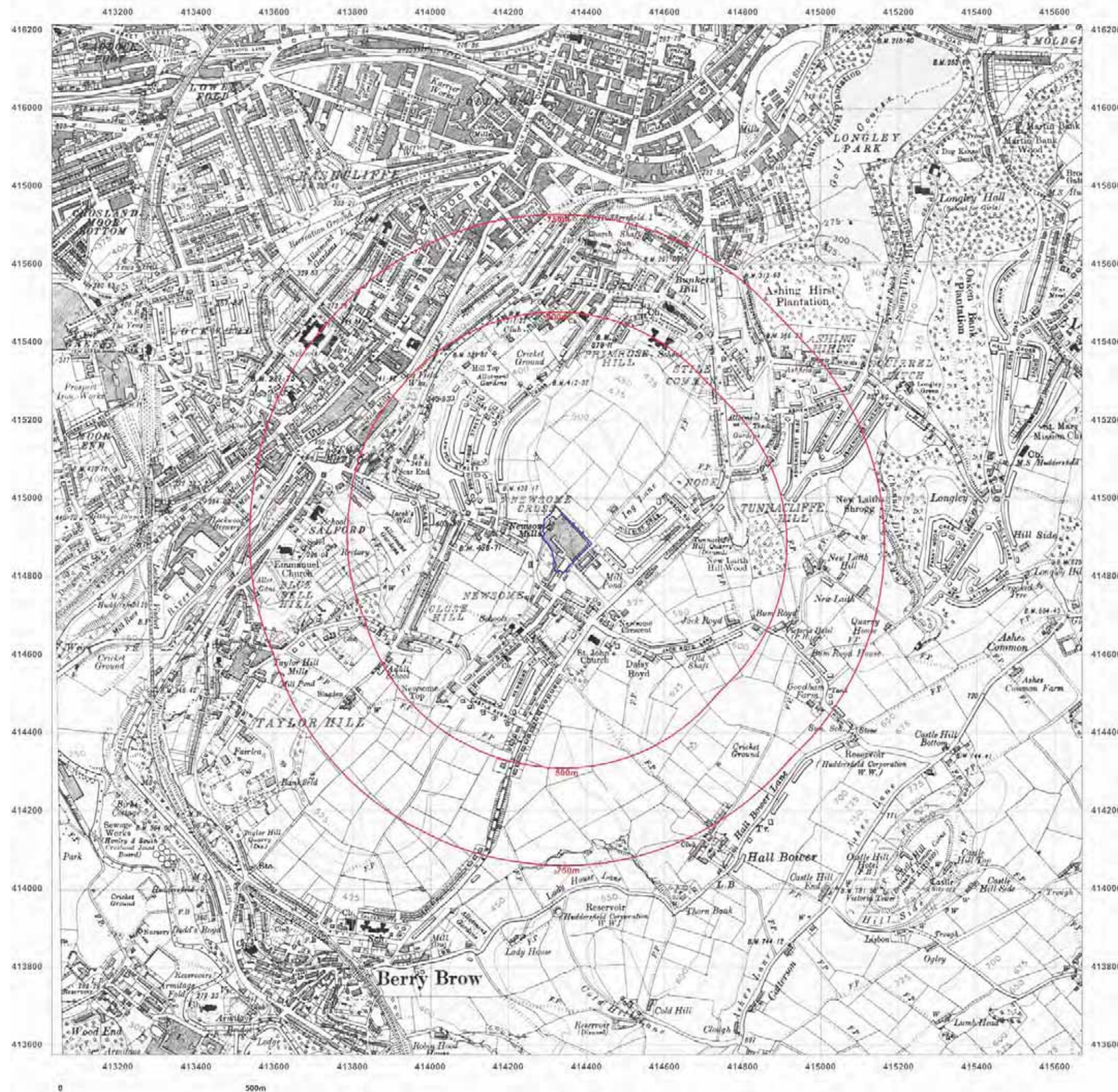


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** County Series

**Map date:** 1948

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1851  
Revised 1948  
Edition N/A  
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Surveyed 1851  
Revised 1948  
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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** Provisional

**Map date:** 1955-1956

**Scale:** 1:10,560

**Printed at:** 1:10,560



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Revised 1951  
Edition N/A  
Copyright 1956  
Levelled N/A

Surveyed N/A  
Revised 1955  
Edition 1956  
Copyright N/A  
Levelled N/A

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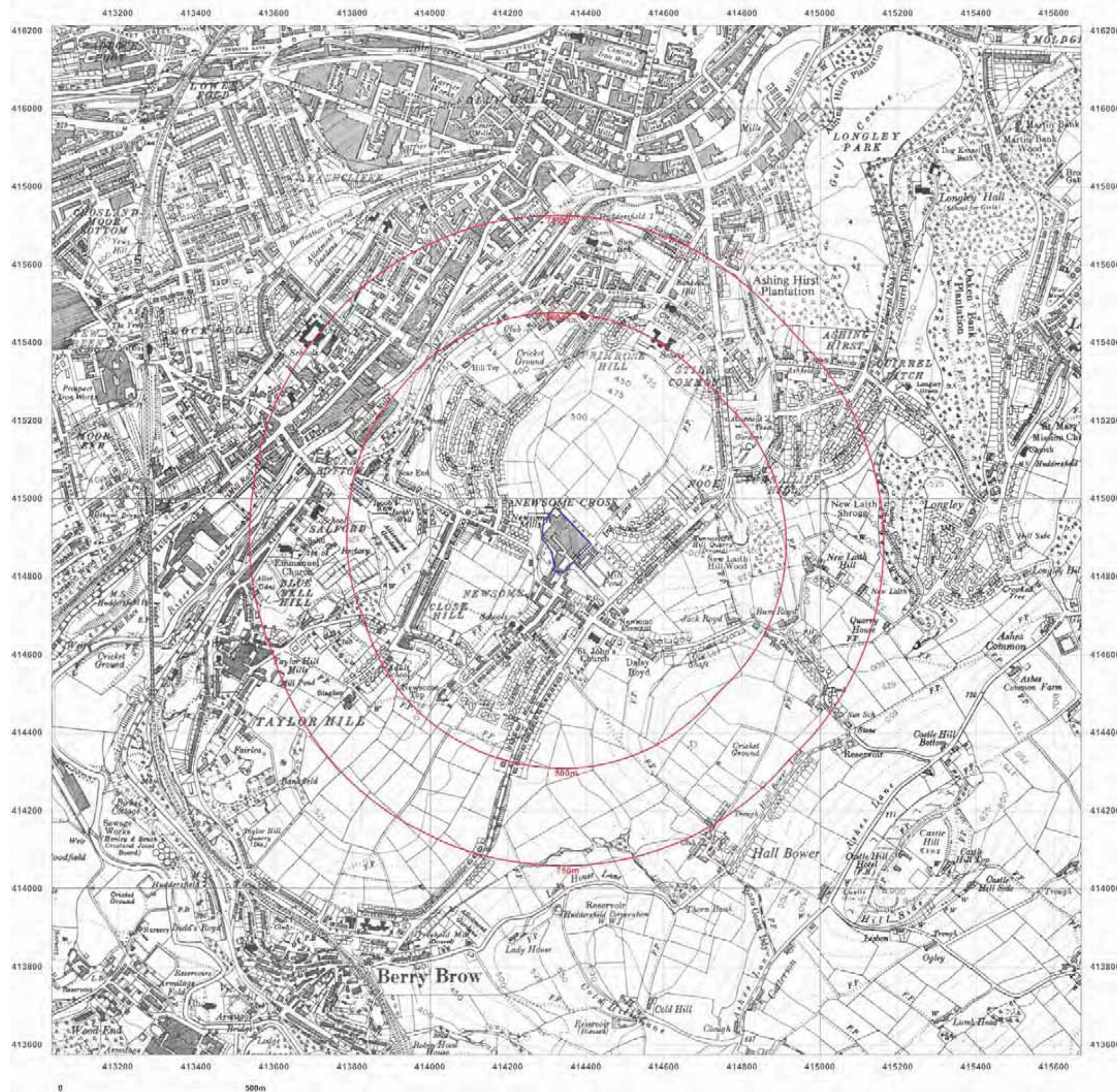


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** Provisional

**Map date:** 1965-1969

**Scale:** 1:10,560

**Printed at:** 1:10,560



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Surveyed 1968  
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Edition N/A  
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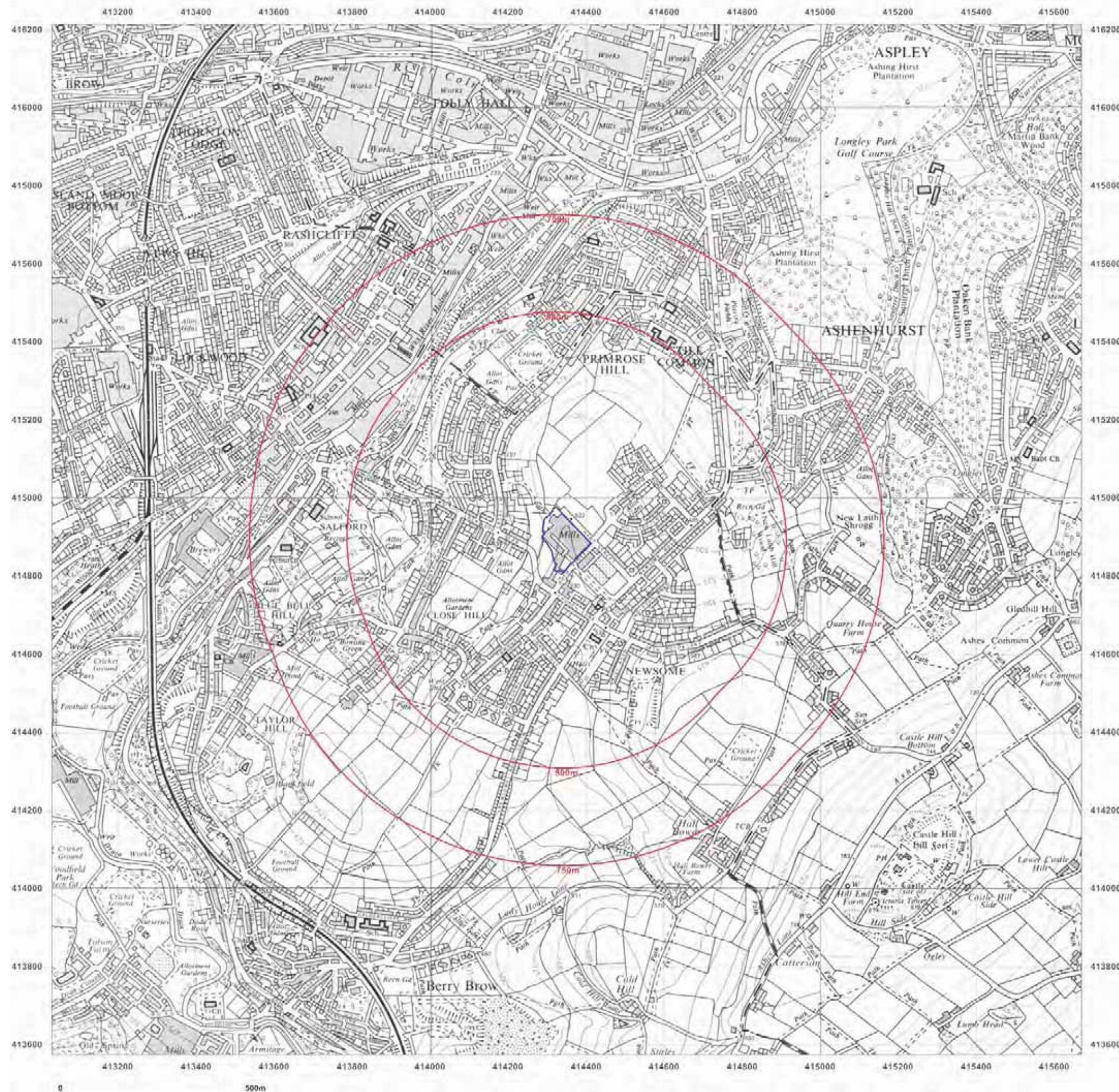


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** National Grid

**Map date:** 1984-1988

**Scale:** 1:10,000

**Printed at:** 1:10,000



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Edition N/A  
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Levelled N/A

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Revised 1984  
Edition N/A  
Copyright N/A  
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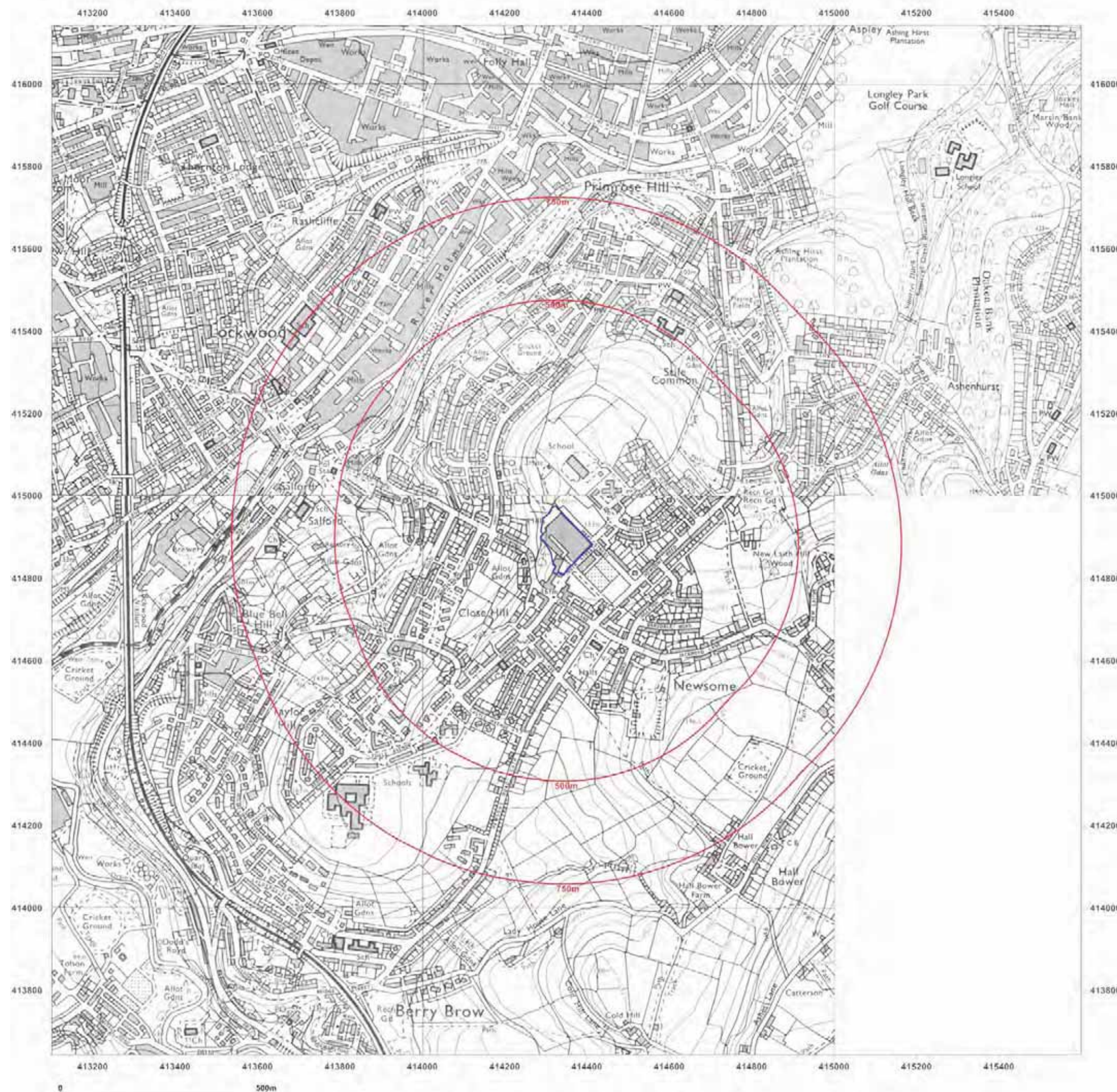


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**Client Ref:** PANORAMA\_LIVING\_7413  
**Report Ref:** GS-5658353  
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**Map Name:** 1:10,000 Raster

**Map date:** 2002

**Scale:** 1:10,000

**Printed at:** 1:10,000

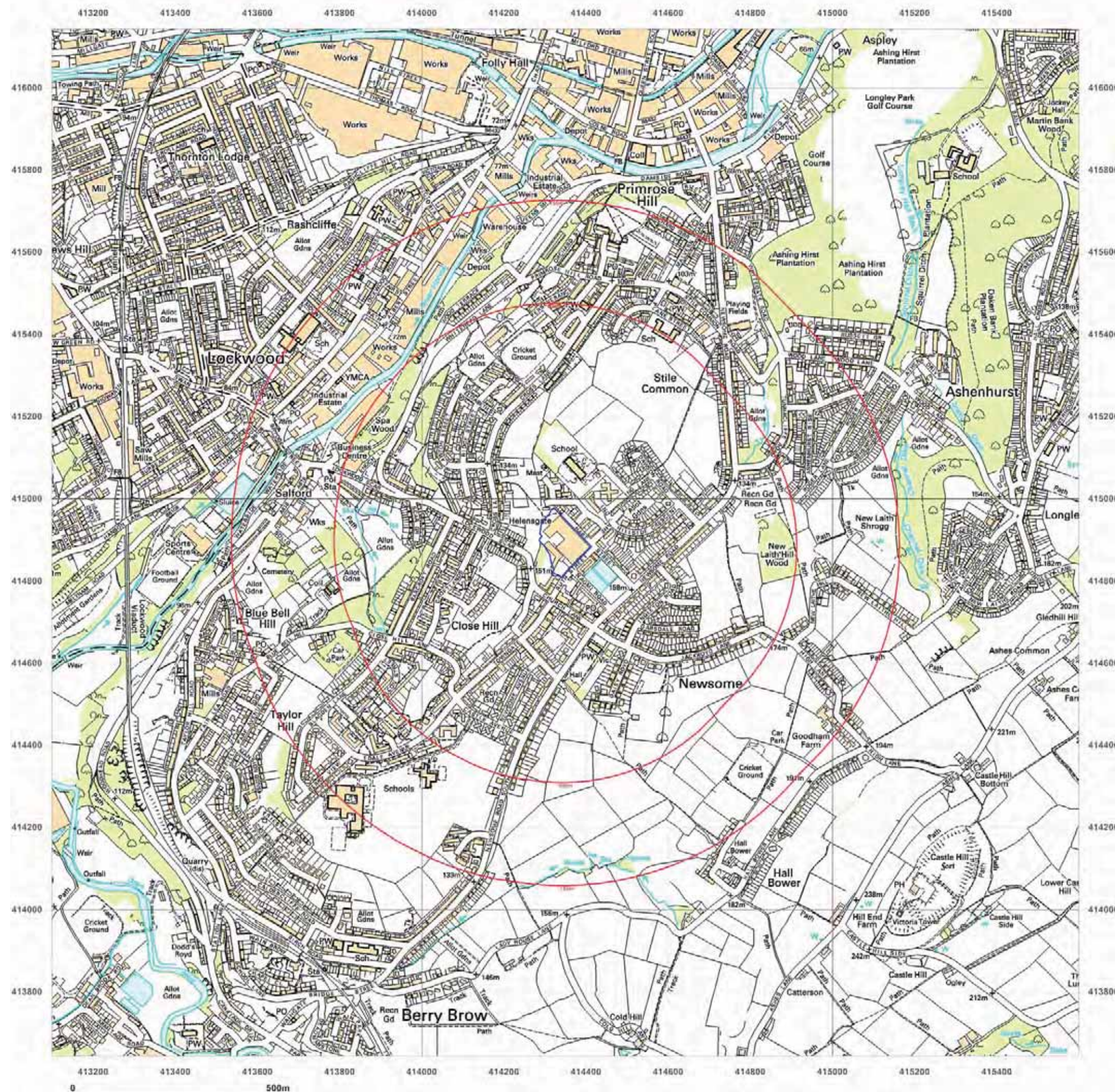


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Client Ref: PANORAMA\_LIVING\_7413  
Report Ref: GS-5658353  
Grid Ref: 414349, 414893

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

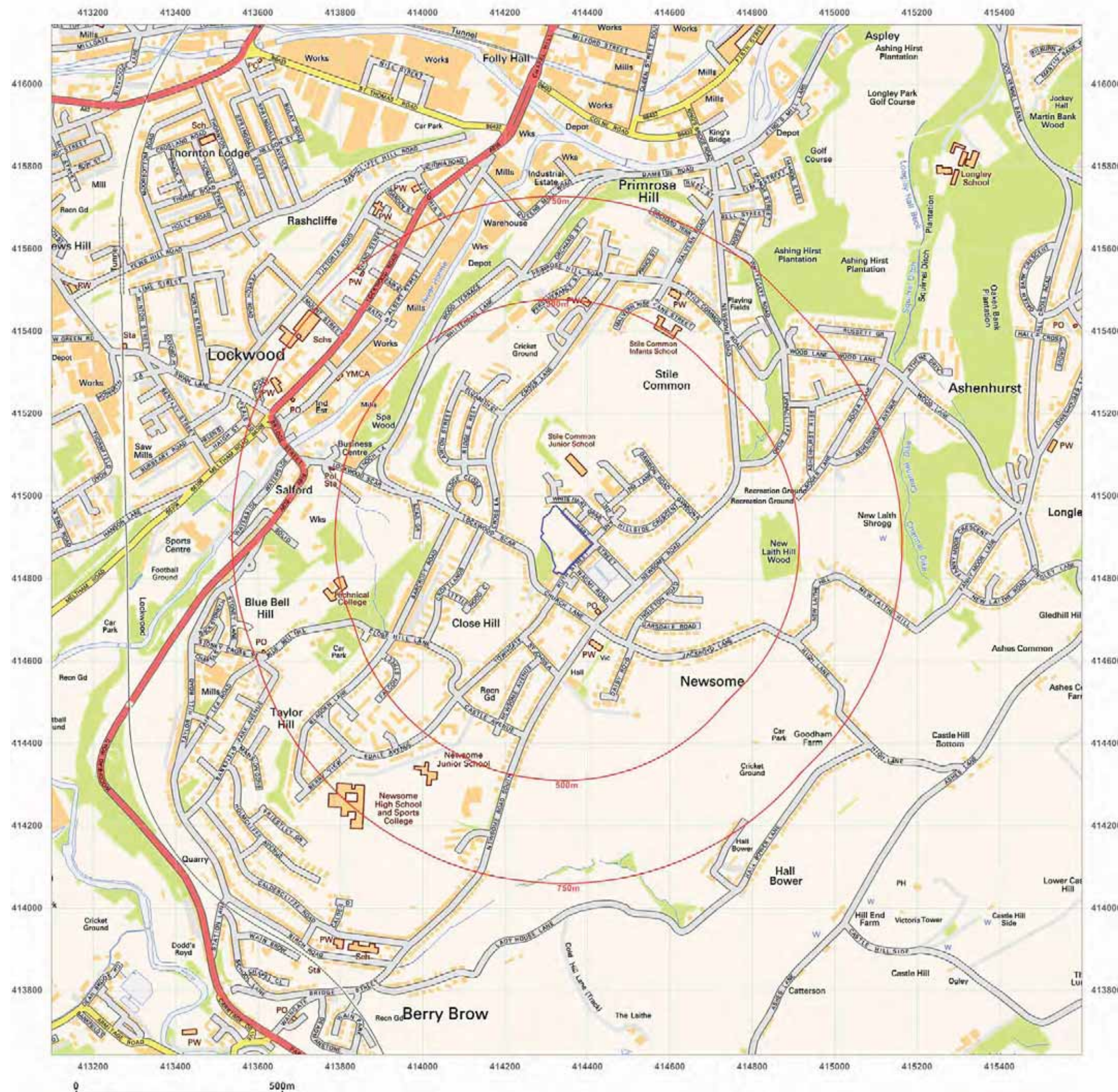


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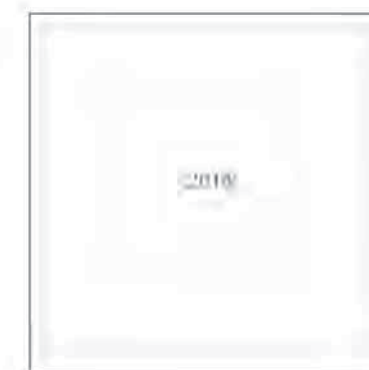
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**Report Ref:** GS-5658353  
**Grid Ref:** 414349, 414893

**Map Name:** National Grid

**Map date:** 2014

**Scale:** 1:10,000

**Printed at:** 1:10,000



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