

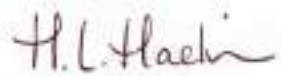
**REPORT ON
GROUND INVESTIGATION
AT
LAND ADJACENT
TO 115 SALE ROAD,
NORTHERN MOOR**



REPORT STATUS SHEET

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1.0 INTRODUCTION

1.1 Objectives and Scope of Investigation

An area of land at Land adjacent to 115 Sale Road, Northern Moor (the site) is being considered for redevelopment by Seva Patidar Ltd (the Client). The proposals for the site comprise the development of a 3-storey building to form nine self-contained apartments with associated car parking and communal landscaping.

Applied Geology was appointed by the Client to undertake a desk study/Phase I assessment and Phase II ground investigation in order to:

- assess the potential for hazardous substances or conditions to exist at the site that might warrant mitigation or remediation appropriate to the intended end use proposed by the Client.
- establish geological conditions and geotechnical parameters to assist in the safe and economic engineering design of the proposed development.
- comply with Planning Condition 13 of Planning Application ref 127586/FO/2020, dated 28th July 2020.

The terms of reference/brief for the works were mutually developed between Marston & Grundy LLP Consulting Engineers (the Client's Engineer) and Applied Geology and are outlined in our proposal (ref: AG20-7487let001) and estimate (ref AG20-7487-01), dated 18th November 2020.

The scope of works undertaken by Applied Geology comprised:

- A site inspection and walkover survey
- A review of the following desk study sources:
 - ❑ GroundSure – GeoInsight & EnviroInsight environmental databases.
 - ❑ GroundSure – MapInsight historical maps.
 - ❑ British Geological Survey (BGS) - published information & on-line borehole database.
 - ❑ Proposed shop and apartments, 115 Sale Road, Northenden, M23 0BU. Preliminary Risk Assessment (Desk Study) dated June 2017, by Worms Eye Ltd
 - ❑ Phase 2 Interpretative Site Investigation Report for Land at 115 Sale Road, Northern Moor, Manchester, Job No: C0135, dated October 2017, by Chevin Geoenviro Associates Ltd.
- Ground investigation together with sampling, monitoring and a programme of laboratory testing.
- Assessment and reporting of the results of the works.

Underground service plans for the site were obtained by Applied Geology between the 7th and 11th January 2021. A topographic survey drawing was not available.

1.2 Report Layout

This report presents a brief description of the site, the desk study data and the factual results of the intrusive investigations carried out. An interpretation of the

ground conditions and a discussion/assessment of the findings is presented in the later report text sections. The main text of the report has been produced in a concise format, including the use of data tables to summarise key information where possible. The report should be read in conjunction with the general procedures detailed in Appendix F and General Notes given at the end of the main text, which provide details of investigation techniques, assessment methodology and standards, health & safety and limitations and exceptions of the report. Drawings and factual data including exploratory hole records, laboratory testing results and desk study records are presented in the other Appendices.

2.0 SITE DESCRIPTION AND PROPOSALS

2.1 Site Description

The site is located on land adjacent to 115 Sale Road, Northern Moor, approximately 8km south of Manchester City Centre. The Ordnance Survey grid reference for the centre of the site is 381627 390495 as shown on the Site Location Plan in Appendix A.

The site is rectilinear in plan shape with dimensions of approximately 20m by 40m. Topographically, the site is relatively flat at approx. 100m AOD.

A site inspection/walkover was undertaken by Applied Geology on 11th January 2021. Access to the site was gained off Sale Road, Northern Moor. At the time of the inspection, the site comprised a parcel of vacant land secured by Heras fencing. The site was predominantly vegetated, with a small concrete driveway to the front and small open gravelled yard area to the rear. The ground surface was predominantly grassed, with localised hardstanding to the south and south eastern parts of the site. The site was bounded to the north by Sale Road, to the east by retail buildings and to the south and west by residential properties and gardens.

The site entrance was secured by Heras fencing. The small area to the southeast was surrounded by heras fencing and secured by a padlocked metal gate. The rectangular area beyond the locked gates comprised large quantities of stockpiled tyres, wood and metal (Photo 3). An area of burnt ground was observed at the surface (Photo 2). An area of fly tipping along with a spoil mound was located in the southwestern corner of the site (Photo 4). Materials included wood, plastic, metal and brick.



Photo 1: View northeast towards Sale Road



Photo 2: An area of burnt ground



Photo 3: View northeast of the area to rear of 115 Sale Road.



Photo 4: Fly tipping and spoil mound (View southwest)

2.2 Site Proposals

The proposals for the site comprise construction of a 3-storey building to form nine self-contained apartments with associated car parking and communal landscaping. The proposals are shown on Preliminary Site Plan, Option B (Drawing P101) by Corstorphine + Wright Architect, dated 28th January 2020. A copy is presented in Appendix A.

3.0 DESK STUDY INFORMATION

3.1 Groundsure Report

The desk study findings are summarised below with the full Groundsure Report and selected Historical Ordnance Survey Maps included in Appendix B.

Site History	• 1874 – Site and surrounding area are agricultural fields; unnamed road to the north. Single residential properties located to the north. • 1905 – Site remains unchanged. Unnamed road identified as Northenden Road. • 1922 – Site remains unchanged. Northenden road identified as Sale Road. • 1935 – the majority of the site remains unchanged; however, the western edge of the site is located within residential gardens. The surrounding area becomes developed with residential dwellings to the west, northwest and east and retail properties to the east. • 1956 – the western part of the site is no longer occupied by residential gardens • 1956 -Present No further significant changes.
Anticipated Geology and Ground Conditions	• Published BGS Map indicates site underlain by solid geology of the Tarporley Siltstone Formation with overlying drift deposits comprising Glaciofluvial Sheet Deposits. • Site is not in a radon affected area, with <1% of homes above the Action Level. No radon protection measures are therefore considered necessary for new properties.

Mining/Quarrying	- Site not indicated to be within area of underground coal or other mining. - Site not in area associated with natural cavity formation.
Hydrology	- There are no surface watercourses within 1000m of the site. - There are no surface water abstractions or licensed discharges within 500m of site. - The site is at very low risk from flooding, less than 1 in 1000 chance of flooding in any given year.
Hydrogeology	- Superficial deposits underlying site are a secondary 'A' aquifer; and the Tarporley Siltstone Formation is a Secondary 'B' aquifer. - Nearest groundwater abstraction license is c.1.8km NW – for potable water supply at Sale Golf Club.
Other Environmental data	- No landfills or licensed waste sites within 250m. 4 current industrial land usages within 250m. Of relevance to the site is an electrical substation 45m to the north. - No recorded petrol/fuel site within 250m. - No recorded pollution incidents within 250m. - No environmentally sensitive ecological designations within 250m.
Geotechnical Risks	- There is a Very Low risk of landslides, collapsible deposits and running sands across the site. - There is a negligible risk of shrink-swell clays, compressible deposits and ground dissolution of soluble rocks across the site.
Railways & Tunnels	There are no records of planned HS2 infrastructure within 1km of the site
Unexploded Ordnance (UXO) Risk	A preliminary UXO risk assessment was commissioned for the site and undertaken by 1st Line Defence, Report Ref: EP12605-00, which concluded that no further action was required for the site with regards to mitigation of UXO risk. The report is included in Appendix B.

3.2 Historical Ground Investigation

Proposed shop and apartments, 115 Sale Road, Northenden, M23 0BU. Preliminary Risk Assessment (Desk Study) dated June 2017, by Worms Eye Ltd

At the time of the site walkover in June 2017, the northern part of the site composed a vacant plot, with a scrapyard/car parts yard to the southeast behind 115 Sale Road buildings. Oil drums, tyres and other parts were noted within the yard during the site walkover.

The report indicated the geology of the site comprised surface drift of fluvial glacial gravel underlain by Tarporley Siltstone Formation. Natural subsidence hazards were indicated to be very low to no hazard. The site was noted to be underlain by a Secondary A aquifer in reference to drift deposits and a Secondary B aquifer with reference to the solid geology.

The report indicated the site history comprised an undeveloped field in 1882 and remained little or no change until 1956. Gardens were located on site between 1956 and 1979. Since 1979 the site remained unchanged.

The Conceptual Model presented in the report includes the following may have potential pollutant linkages:

- Asbestos – Construction workers – inhalation;
- Hydrocarbons and vapours - Construction workers – inhalation/short term direct contact, ingestion

The report indicated that, as the northern area has been undeveloped, the contamination risk was low. However, the scrapyards/car parts yard to the southeast may be a source of contamination and therefore represent a higher level of risk but, as this area was to be occupied by proposed car parking, the report indicated there was still a low risk to end-users.

Risk to controlled waters was reported as low.

As the proposed development includes residential end use, the report suggested a limited intrusive investigation; including borehole/trial holes and testing to confirm findings of the desk study and aid foundation design. Targeted investigation suggested in the south-eastern area where landscaping was proposed.

Phase 2 Interpretative Site Investigation Report for Land at 115 Sale Road, Northern Moor, Manchester, Job No: C0135, dated October 2017, by Chevin Geoenviron Associates Ltd.

The investigation comprised three machine excavated trial pits to 1.30m below ground level (bgl). Made Ground was encountered locally within TP2 and TP05 to depths of 0.50m and 0.30m respectively. Topsoil extended to 0.90m within TP1. Beneath the Made Ground and Topsoil, natural Superficial deposits were encountered, comprising gravelly sand. No groundwater was encountered during the investigation.

The assessment criteria for the human health assessment were based upon a commercial end use. The determinants were below the assessment criteria for commercial end use, however, the report highlighted a TPH concentration of 1100 mg/kg (not elevated against the screening value indicated in the report) within TP2 at depth of 0.20m located in the southwestern part of the site.

The report suggests that there is a very low ground gas risk based upon the low organic matter content within the soils.

The soil descriptions suggest that the Glaciofluvial Sheet Deposits are loose, however no in-situ testing was undertaken to confirm this. No reference was made to proposed foundation options.

The report concludes that Made Ground at 0.50m contains level of total TPH. The source of contamination within TP2 (southwestern part of the site) is to be covered by the proposed building foot print and therefore forming a suitable protection barrier for human health and controlled waters. Therefore, the future commercial end use risk is very low and no further assessment of the contamination is required. A recommendation is to confirm the new pipe requirements with United Utilities Plc.

4.0 CONCEPTUAL SITE MODEL

4.1 Diagrammatical Illustration

The Conceptual Model for the site, showing the main elements of the surface and subsurface conditions and including the potential contaminant sources, pathways and receptors identified from the desk study information is presented in Appendix A as Drawing No AG3225-21-03. The potential sources, pathways and receptors are defined in the following sections:

4.2 Sources

- Made Ground Soils on site associated with adjacent development;
- Possible elevated TPH within Made Ground in the southwestern part of the site (based on previous Chevin Geoenviro Associates investigation);
- Possible metal, asbestos, solvents, battery acids, greases contamination associated with the Former Scrap yard in the south-eastern part of the site (based on previous Worms Eye Ltd, desk study);
- Sulphates in Made Ground or, to a lesser extent, the underlying natural strata.

4.3 Pathways

Should any contamination be present, potential/identified pathways to the above receptors are as follows:

Dermal contact, Ingestion, and Inhalation - End users could be at risk from dermal contact, ingestion, and inhalation pathways if elevated concentrations of contaminants were present if sufficient concentrations.

Direct Contact - Buried concrete could be affected by direct contact with soils if these contain elevated levels of sulphate. Water supply pipes could be affected by direct contact with soils if contamination, particularly, hydrocarbons are present.

Leaching and/or migration - to the Glaciofluvial Sheet Deposits Secondary 'A' Aquifer receptor.

4.4 Receptors

- End users and adjacent residents.
- Buried Concrete and new water supply pipes.
- Glaciofluvial Sheet Deposit– Secondary 'A' Aquifer (Controlled Waters).

4.5 Source/Pathway/Receptor Linkage and Assessed Risk

Source-pathway-receptor (SPR) linkages are tabulated below together with the qualitatively assessed risk. The risk to ground workers and construction workers is not included here due to the short-term exposure times that they will be subject to and the assumption that good hygiene practices will be adopted on site and the appropriate use of relevant PPE/RPE will be adhered to when exposed to potentially contaminated soils. Comments regarding contamination issues with respect to ground workers and construction workers are included in the health and safety section of the Standard Procedures included as Appendix F.

Source	Pathway	Receptor	Risk*
Potential contaminants within Made Ground (heavy metals, PAHs, asbestos).	Inhalation, ingestion, dermal contact.	End users	Low
		Adjacent residents	Negligible
	Direct Contact	Water Supply Pipes	Low

Source	Pathway	Receptor	Risk*
Elevated sulphates in Made ground or natural soils	Direct contact,	Buried concrete	Low
Hydrocarbon contaminants within soils	Direct contact	Water supply services	Low

*** Definition of Risk Categories**

Negligible - Contaminants that might have unacceptable impact on key receptors, are unlikely to be present, or, no pathway is envisaged.

Low Risk: Contaminants may be present but are unlikely to be at levels to have unacceptable impact on key receptors, or pathways are likely to be minimal.

Medium Risk: Contaminants are probably present and might have an unacceptable impact on key receptors. Pathways may also be present therefore remedial measures may be necessary to reduce the risks.

High Risk – Contaminants probably or certainly present and pathways are probably also present. Therefore, contaminants are likely to have an unacceptable impact on key receptors and remedial measures are likely to be necessary to reduce the risks to acceptable levels.

5.0 GROUND INVESTIGATION WORKS

5.1 Fieldwork

The following scope of fieldwork was undertaken:

- 2 No 150mm diameter Cable Percussion boreholes (ref. BH1 and BH2) to depths of between 5.65 and 5.66m below ground level (bgl);
- 2 No Machine Excavated Trial Pits (ref. TP1 and TP2) to depths of between 2.00m and 2.30m bgl;
- 1 No Soakaway infiltration test within trial pit TP1;
- 6 No. TRL Dynamic Cone Penetrometer Tests (TRL01 to TRL06), to depths between 820mm and 890mm bgl;
- 1 No. Hand sample of spoil mound.

The exploratory hole records and SPT calibration certificates are included in Appendix C. The soakaway test results and TRL probe results are included in Appendix D.

The locations of the exploratory holes were provisionally selected by Marston & Grundy LLP Consulting Engineers and set out on site by Applied Geology Limited and these were somewhat constrained by available access on site and the presence of underground and overhead supply services.

The sampling strategy for the exploratory hole locations was to provide best overall coverage given the access constraints. The cable percussive boreholes were positioned to permit collection for environmental and geotechnical data and to allow for the installation of groundwater monitoring standpipes. One machine excavated trial pit (TP2) was positioned to permit collection for shallow environmental data and one machine excavated trial pit (TP1) was undertaken primarily to permit soakaway testing. The test was undertaken in general accordance with BRE Digest DG365 methodology and was undertaken in a gravel supported trial pit filled on three occasions.

Testing was undertaken using a Transport Research Laboratory Dynamic Cone Penetrometer (TRL DCP), at locations within the proposed hardstanding/car parking areas, in order to provide information on likely in-situ CBR parameters. The results

are plotted as blow count versus depth with equivalent CBR values estimated for individual layers in accordance with IAN 73/06 Revision 1 (2009).

The positions of the exploratory holes were defined by taping from identifiable features on available aerial photography. The locations are presented on Drawing No. AG3225-21-02 in Appendix A.

5.2 Instrumentation and Monitoring

No significant sources of ground gas have been identified from the desk study and only a relatively thin layer of Made Ground with minimal degradable material was encountered on site during the investigation. As such, gas monitoring was not considered to be warranted and the installations were installed for groundwater monitoring purposes only. On completion of boring, 50mm diameter standpipes were installed in selected boreholes as follows, with further details included in the relevant borehole logs in Appendix C:

- BH1, 1.50 to 5.50m bgl in Glaciofluvial Sheet Deposits/Glacial Till;
- BH2, 1.50 to 3.00m bgl in Glaciofluvial Sheet Deposits.

Washed silica gravel (2-6mm) was used as the filter medium and a 250 micron filter sock was wrapped around the slotted section of the standpipe. Each standpipe was fitted with a push-in bung and was finished with flush metal cover concreted in place. One return groundwater monitoring visit was undertaken on 26th January 2021.

5.3 Laboratory Testing

Geotechnical laboratory testing was undertaken on selected samples and comprised the following:

- 2 No natural moisture content tests;
- 2 No Atterberg limit tests;
- 2 No particle size distribution tests;
- 2 No. Single Stage Triaxial Test;
- 6 No BRE SD1 suite tests.

Chemical testing was undertaken based upon the desk study, walkover and site observations during the fieldwork. Four samples of Made Ground and one sample of natural strata were analysed for the following suite of contaminants:

- Selected metals suite [arsenic, cadmium, chromium (total, trivalent and hexavalent), copper, mercury, nickel, lead, zinc, selenium];
- Speciated (16 US EPA) Polycyclic Aromatic Hydrocarbons (PAH);
- Phenols (total);
- pH;
- Soluble sulphate; and
- Organic matter.

In addition, three samples were submitted for Total Petroleum Hydrocarbon (TPH-CWG) testing from the locations of the burnt ground and four samples of the Made Ground were tested for the presence of Asbestos testing within the soil.

Two samples of Made Ground were submitted for leachate testing, the samples were analysed for the following suite of contaminants:

- Selected metals suite [arsenic, cadmium, chromium (total, trivalent and hexavalent), copper, mercury, nickel, lead, zinc, selenium];
- Speciated (16 US EPA) Polycyclic Aromatic Hydrocarbons (PAH);
- Phenols (total);
- pH;
- Soluble sulphate; and
- Total Organic Carbon.

Laboratory test results are included in Appendix E.

6.0 GROUND CONDITIONS

6.1 Strata Encountered

Generally, between 0.9 and 1.2m bgl of Made Ground was encountered overlying Glaciofluvial Sheet Deposits and Glacial Till, which in turn overlies the Tarporley Siltstone Formation. Bedrock was encountered in BH1 and BH2 at depths of 5.0m and 5.2m bgl. Full details of the strata encountered are given on the borehole records presented in Appendix C. A generalised ground profile is presented below to summarise the information.

Stratum	Depth to Top of Strata (m bgl)	Thickness (range) (m)	Comments
Topsoil	GL	0.05/0.40	Topsoil was recorded in BH1, BH2 and TP2 only
Made Ground	GL/0.40	0.8/1.20	Encountered in all exploratory holes
Reworked Glaciofluvial Sheet Deposits	1.00	0.50	Recorded in TP2 only
Glaciofluvial Sheet Deposits	0.90/1.50	0.80/1.4	
Glacial Till	2.50/2.60	2.5/2.6	
Tarporley Siltstone Formation	5.00/5.20	0.66+	Base not proven

6.2 Topsoil

Topsoil was encountered in the main part of the site at BH1, BH2 and TP2 from ground level to between 0.05m and 0.4m bgl. The topsoil generally comprised brown slightly clayey slightly gravelly sand with frequent rootlets. The gravel comprised fine to coarse, angular to subrounded sandstone, brick quartzite and mudstone.

6.3 Made Ground/Disturbed Ground

Made Ground was encountered within all locations between ground level and 0.40m bgl, to depths of between 0.9 and 1.2m bgl, achieving a maximum thickness of 1.2m. The Made Ground generally comprised dark grey slightly clayey sandy gravel including glass, brick, ceramic, metal fragments. TP1, located to the southern end of the site, encountered Made Ground comprising dark grey angular ashy gravel from ground surface to 0.30m bgl.

Strata interpreted to be Disturbed Ground and probable reworked Glaciofluvial Sheet Deposits were encountered in TP2 between 1.0m to 1.5m bgl. The material comprised orangish grey brown mottled clayey sandy gravel.

Headspace analysis was carried out on samples of the Made Ground recorded VOC concentrations of less than the limit of detection (<0.1ppm).

6.4 Glaciofluvial Sheet Deposits

Glaciofluvial Sheet Deposits were encountered beneath the Topsoil and Made Ground at all locations. The proven depths of this stratum were recorded as 2.5m and 2.6m bgl in the cable percussive boreholes, achieving thicknesses of 1.3m and 1.4m.

The Glaciofluvial Sheet Deposits comprised orangish brown clayey gravelly sand. The gravel was fine to coarse subangular to subrounded siltstone mudstone and sandstone. A gravel band was recorded within BH1 and TP2 from 2.0m bgl, proven to 2.6m bgl in BH1. This comprised medium dense light grey sandy angular to subrounded and fine to coarse gravel. A cohesive layer was recorded in TP2 between 1.5m and 2.0m bgl and comprised soft orangish brown sandy gravelly clay.

Two particle size distribution tests undertaken on samples of the Glaciofluvial Sheet Deposits recorded a fines content of 7% and 19%, sand content of 65% and 76%, and a gravel content of 5% and 28%, indicating the soil generally to be clayey/silty gravelly sand, which is in general accordance with the field descriptions.

The result of one Atterberg limit test carried out on a sample of the cohesive Glacial Sheet Deposits recorded plastic limit of 17%, liquid limit of 30%, plasticity indices of 13%, and moisture content of 25%. The result indicates the soil to be a clay of low plasticity with a low volume change potential.

Four SPTs carried out in the Glaciofluvial Sheet Deposits recorded 'N' values of between N=4 and N=23 (loose to medium dense).

6.5 Glacial Till

Glacial Till was encountered in BH1 and BH2 only, between 2.5m and 2.6m bgl. The Glacial Till comprised firm to stiff brown slightly sandy slightly gravelly clay with the gravel fraction comprising subangular to subrounded fine to coarse sandstone and siltstone.

The result of an Atterberg limit test carried out on a sample of the Glacial Till Deposits recorded a plastic limit of 11%, a liquid limit of 27%, a plasticity index of

16% (corrected PI also 16%) and a moisture content of 17%. The result indicates the soil to be a clay of low plasticity with a low volume change potential.

The results of two single quick undrained triaxial tests carried out in the Glacial Till at 4.0m in each borehole gave undrained shear strengths of 83kN/m² and 132kN/m² (high strength).

Two SPTs carried out in the Glacial Till Deposits recorded 'N' values of N=13 and N=19. By applying the empirical relationship between SPT 'N' value, mass shear strength and using a plasticity of 16 and a corresponding f_1 of 6, this correlates to a mass shear strength of between c.80kN/m² (medium strength) and 115kN/m² (high strength). This generally correlates with the triaxial results.

6.6 Tarporley Siltstone Formation

Tarporley Siltstone Formation was encountered within both cable tool boreholes at similar depths of 5.2m (BH1) and 5.0m bgl (BH2) where the holes terminated. In BH1 the Tarporley Siltstone Formation was recorded as red sandstone (recovered as angular gravel) and red mudstone (recovered as very stiff red slightly gravelly sandy clay) within BH2.

Four SPTs carried out in the weathered Tarporley Siltstone Formation all 'refused' i.e. penetrated <300mm for 50 blows. Actual penetrations were recorded as between 85mm and 150mm, giving extrapolated N values of between 100 and 176. However, for clarity, these results are shown as N=50 on the SPT N value against depth plot.

6.7 Groundwater and Soakaway Tests

Groundwater

Groundwater strikes were recorded during drilling and trial pitting in some of the exploratory holes as follows:

Exploratory Hole	Depth Struck (m bgl)	Depth Rose To (m bgl)	Strata
BH1	4.50	4.00	Glacial Till
TP2	2.00	-	Glaciofluvial Sheet Deposits - Gravel

One return monitoring visit on 26th January 2021 recorded water levels as 1.55m and 1.50m bgl in BH1 and BH2 respectively.

Soakaway tests

The soakaway was undertaken within TP1, targeting the granular Glaciofluvial Sheet Deposits (Sand), between 0.9m and 2.0m bgl. The test was repeated three times and the results of the testing in TP1 indicates a soil infiltration rate of approximately 1×10^{-4} m/s.

6.8 Contamination

Other than a small amount of degradable material within the relatively thin layer of Made Ground encountered across the site, no visual/olfactory signs of contamination were noted during the site investigation. An area of burnt ground was observed at the surface location of TP1 and fly tipping was noted on the western part of the site in and against the stockpiled mound.

7.0 GEOENVIRONMENTAL ASSESSMENT

7.1 Human Health Risk Assessment

The results of the chemical testing on soils have been assessed as described in Appendix F, with specific details as follows:

- Proposed end-use –3-storey building to form nine self-contained apartments with associated car parking and communal landscaping;
- Screening criteria – residential without plant uptake, assuming 6% SOM;
- Assuming a single dataset based on the size of the site, the site's history, current land-use and/or the proposed redevelopment.

The spreadsheets summarising the laboratory results and relevant screening values for each dataset are presented in Appendix E. For determinands that have been found to exceed screening values, the following table summarises the individual results, the corresponding screening values and the number of exceedences.

Contaminant	No of samples tested	Concentration Range (mg/kg)	Screening Value (mg/kg)	No. of exceedences
Lead	5	18 - 690	310	1
Benzo[a]pyrene	5	0.05 - 23	5.3	1

From this table it can be seen that lead and Benzo[a]pyrene (BaP) concentrations exceed their corresponding screening values. Both these relate to a shallow Made Ground sample taken from TP2 at 0.8m bgl.

The asbestos screening tests recorded the presence of chrysotile asbestos fibres at two locations within the shallow Made Ground; however, both were noted at the reportable detection limit of <0.001% by weight. These were from in TP1 at 0.6m bgl and from the spoil mound sample. The presence of asbestos fibres at these concentrations are not untypical of Made Ground and can be considered to be background concentrations in urban areas. It is assumed that the spoil mound will be removed off site prior to development, further reducing the risk to end users.

Measurable concentrations of aromatic petroleum hydrocarbon (TPH) fractions were encountered within the shallow Made Ground, which are probably a measure of the PAHs. The concentrations were recorded between 0.012mg/kg and 72kg/mg; however, all are below the relevant screening values, all non-volatile and all can be considered negligible. The MTBE and total phenols were all recorded below detection limits.

No elevated concentrations of TPHs, PAHs (or other contaminants) were recorded in the natural strata.

7.2 Controlled Waters Risk Assessment

Leachate tests were carried out on samples of the shallow Made Ground from BH2 at 0.1m and TP2 at 0.2m bgl. The spreadsheet summarising the laboratory results and relevant screening values of the dataset is presented in Appendix D. For contaminants that have exceeded their corresponding screening values, the table summarises the individual results.

Contaminant	Samples Tested	Concentration Range (µg/l)	Screening Value (µg/l)	Exceedances
Lead	2	1.9 - 14	10	1

From the table it can be seen that one sample marginally exceeded the screening value for lead. The lead exceedance (14µg/l) was recorded in TP2 at 0.2m bgl, which also included metal fragments within the shallow Made Ground.

No other contaminants recorded concentrations above their corresponding limit of detection and/or screening value. All PAH compounds were recorded below their limits of detection.

Based on the results of the above, there is generally considered to be a low risk to Controlled Waters. It is assumed that the fly tipped materials including metal fragments will be removed during site enablement to reduce further the possible leaching of metallic determinands.

7.3 Disposal of Soil Arisings

The results of the chemical testing on the shallow Made Ground generally indicates the material would likely be classified as non-hazardous waste if sent for disposal at landfill (for which WAC testing is not required). It should be noted that asbestos fibres at background concentrations have been identified in the Made Ground. Should significant quantities of bulk asbestos containing material be detected in the soils during site development, a specialist contractor should be consulted to advise treatment/removal and disposal.

The natural soils are likely to be classified as inert waste, if sent for disposal, but this should be confirmed by the landfill operator prior to disposal. The inert WAC test undertaken on a composite sample of natural soil shows compliance with the inert waste criteria.

General comments regarding the procedures for the assessment of waste soil for off-site disposal purposes is included in Appendix F.

7.4 Conclusions and Recommendations

The above risk assessments have established a potential risk to human health due to the presence of elevated concentrations of lead and BaP in the shallow Made Ground across the site. As the development proposal indicates the majority of the site will be covered by hardstanding and or buildings and will effectively eliminate

pathways between the end users and the underlying soils, thus the risk is considered to be low.

Communal soft landscaping areas are to be proposed therefore there is the potential for human health receptors to come into contact with the contaminated materials via direct contact and dust inhalation/ingestion. It is recommended that the potential risk is mitigated by the placement of an inert cover layer and brightly coloured geotextile marker layer (to act as a no-dig marker and to prevent mixing) in the soft landscaping areas, thus breaking the potential pathway to end users. Subject to agreement with the Local Authority (via a Remediation Strategy), a cover layer may be considered suitable for soft landscaping areas.

It is assumed that the fly tipped material and stockpiled mound will be removed from site as part of the enabling works.

Issues with respect to potential effects of contaminants on buried concrete and water supply pipework are included in Section 8.0.

8.0 GEOTECHNICAL ASSESSMENT

8.1 General

The proposals comprise the development of 3-storey building to form nine self-contained apartments with associated car parking and soft landscaping areas. Proposed wall line loads have been indicated to be 75kN/m and up to a maximum of 125kN/m per metre run.

In summary, the ground investigation has identified Made Ground and/or reworked ground (comprising natural material) up to 1.50m bgl, underlain by loose becoming medium dense Glaciofluvial sheet Deposits to 2.50m bgl, subsequently underlain by Glacial Till to depths of c.5m where the Tarporley Siltstone Formation was encountered. Groundwater was encountered within the natural deposits and was measured at c.1.5m bgl during a single monitoring visit.

8.2 Foundation Design

It is considered that the Glaciofluvial Sheet Deposits at the site are potentially suitable to support conventional strip/trench fill foundations if placed below any Made Ground or disturbed ground and also beneath any soft or loose natural materials. It will be necessary to embed the foundations within the in-situ medium dense granular strata beneath these materials. A proposed founding depth of 2.0m is likely to be required to ensure that the above deepening criteria are met, however, it should be noted that groundwater has been recorded at approx. 1.5m bgl and therefore dewatering may be required. Alternatively, consideration may need to be given to a deeper foundation solution including ground improvement or piling.

Strip/trench fill foundations (1m wide) competently designed to the above requirements may adopt safe net design bearing pressures up to 125kN/m². This is based on a typical N value of 10 over influencing depth of foundations using traditional methods of bearing capacity calculations e.g. as set out in Tomlinson 7th Edition and a factor of safety of 3 against bearing capacity failure.

Ground Improvement

The Made Ground soils identified are considered likely to be suitable for improvement using the vibro replacement ground improvement process. Allowable bearing pressures of 80kN/m² to 125kN/m² are typical for foundations placed on stone columns, however, it is recommended that a specialist contractor is consulted to confirm the suitability of the soils to be treated and the achievable bearing pressures, taking into account the recorded groundwater level.

Piling foundations

Piles would need to be largely end bearing founding within the Tarporley Siltstone Formation, which was encountered at c.5m bgl. An SPT 'N' value versus depth plot is included in Appendix A and should be referred to along with the borehole logs when designing piles. The advice of specialist and experienced piling contractors should be sought in relation to suitable piling techniques and designs for ground conditions at the site though driven, bored and CFA piling methods may all be feasible. The effects of negative skin friction associated with the Made Ground and layers of soft cohesive materials should be considered. Deeper rotary cored boreholes may be required to provide sufficient information on the bedrock for pile design purposes.

It should be noted that casing of the Made Ground and granular Glacial Deposits may be required, dependent on the piling technique utilised, to prevent the ground from collapsing. The ground investigation has identified the potential for encountering obstructions such as cobbles within the Glacial Till which may pose a potential problem during the installation of piles. The proximity of the surrounding road infrastructure/services, slopes, and adjacent properties will need to be considered when selecting the piling rig and piling methodology.

The piling operations will require the construction of a suitably robust working platform designed appropriately to accommodate the proposed plant and the underlying ground conditions. Applied Geology can produce such a design if required.

If conditions, significantly at variance to those described herein are encountered, specialist geotechnical advice should be sought to make appropriate assessment and recommendations.

8.3 Floor Slab and Gas Protection

Made Ground has been proven to between 0.9m and 1.2m bgl, and as such, a suspended floor slab is recommended unless a vibro replacement stone column foundation solution be selected, then ground bearing floor slabs supported on the vibro-improved ground maybe adopted.

Based on the conceptual model and the ground conditions encountered, there is no identified source of ground gas. Therefore, there is considered to be a negligible risk from ground gas and it is considered that the site can be characterised as Situation 1 (CIRIA C665) for which no gas protection measures are considered necessary.

8.4 Excavations

Excavations up to c.2m deep are envisaged for foundation excavations and service trenches. At these depths, excavations are expected to be in a combination of Made Ground and granular Glacial Deposits. These materials may be prone to some short-term instability and spalling and may need to be graded back to a stable angle or trench support should be provided. Trench support or the angle of batter should be designed by an appropriately qualified engineer or competent person to suit the required depth and the ground and groundwater conditions.

Standing water levels c.1.5m bgl have been recorded during a return monitoring visits. It is therefore recommended that some provision for obtaining sump pumping equipment is made to control any shallow or perched groundwater ingress and possible run off in wet weather conditions.

8.5 Pavement Design

Topsoil should be stripped prior to pavement construction.

In-situ TRL tests at or near the proposed car park in the southeast of the site are considered to be within Made Ground, based on TP1 findings. Test results were extremely variable, as would be expected within Made Ground, and equivalent CBR values ranged between 6% and 36%. Given this, and taking into account the nature of the material, an equilibrium CBR value of 5% is recommended for this stratum, subject to proof rolling and soft spot removal.

An equilibrium CBR value of 5% is recommended for Glaciofluvial Sheet Deposits.

8.6 Soakaways

Owing to the presence of shallow natural granular deposits and the infiltration tests indicating infiltration rate of circa. 1×10^{-4} m/s, soakaways are likely to be suitable in the car park area, although the shallow depth to groundwater should be considered during design.

8.7 Buried Concrete and Services

The results of the testing carried out on samples of the Made Ground across site indicate characteristic values as following:

- water soluble sulphate: 0.27g/l;
- total potential sulphate: 0.33%;
- pH: 7.4.

The results of the sulphate tests carried out on samples of the Made Ground have identified the Design Sulphate Class to be DS-2 with the Aggressive Chemical Environment for Concrete (ACEC) being AC-2 as defined by the BRE Special Digest 1, Concrete Aggressive Ground, 2005 for a brownfield site and mobile groundwater regime.

The results of the testing carried out on samples of the natural soils generally indicate characteristic values as following:

- water soluble sulphate: 0.19g/l;

- pH: 6.8.

The results of the sulphate tests carried out in the natural strata have identified the strata to be potentially pyritic Design Sulphate Class to be DS-1 with the Aggressive Chemical Environment for Concrete (ACEC) being AC-1 as defined by the BRE Special Digest 1, Concrete Aggressive Ground, 2005 for a brownfield site and mobile groundwater regime. Further reference should be made to BRE Special Digest 1 for requirements in respect of types of cement and aggregate to be used and variations in type of concrete construction.

Only low concentrations of TPHs were detected in tested samples. Considering this, restrictions on buried water supply pipe materials are unlikely, however, this should be discussed and agreed with the local Water Authority.

8.8 Conclusions and Recommendations

The Glaciofluvial Sheet Deposits underlying the site are considered suitable to support strip/trench fill foundations at depth of c.2m bgl, providing a safe net design bearing pressures of up to 125kN/m². However due to shallow groundwater at c.1.5m bgl, a ground improvement or piling solution may be preferable.

A suspended floor slab is recommended unless ground improvement is utilised to enable the use of ground bearing floor slabs. No gas protection measures are considered necessary.

Conventional soakaways are considered viable in the area of proposed car parking.

Buried concrete should be designed in accordance with DS-2 and AC-2 conditions.

No special precautions are envisaged regarding water supply pipes.

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GENERAL NOTES

- A) The assessment made in this report is based on the site terrain and ground conditions revealed by the various field investigations undertaken and also any other relevant data for the site including previous site investigation reports (if available) and desk study data. There may be special conditions appertaining to the site, however, which have not been revealed by the investigation and which have not, therefore, been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available. It must be recognised that many of the Environmental Searches obtained during the course of the desk study are often lengthy. Applied Geology have, where appropriate and in the interests of simplicity, only reproduced the summary of the searches within the report. A full copy of all the search data is held at the Applied Geology office and is available for inspection if required.
- B) The services provided are defined within our proposal and are carried out in line with the terms of appointment between Applied Geology and the Client.
- C) Where any data supplied by the Client or other external source, including that from previous site investigations, has been used it has been assumed that the information is correct. No responsibility can be accepted by Applied Geology for inaccuracies within this data.
- D) Whilst the report may express an opinion on possible configurations of strata between or beyond the exploratory locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy.
- E) Comments on groundwater (and landfill gas) conditions are based on observations made during the course of the present and past investigations or with reference to published data unless otherwise stated. It should be noted, however, that groundwater (and landfill gas) levels vary due to seasonal (or atmospheric conditions) or other effects.
- F) The copyright of this report and other plans (and documents prepared by Applied Geology) is owned by Applied Geology and no such report, plan or document may be reproduced, published or adapted without the written consent of Applied Geology. Complete copies of the report may, however, be made and distributed by the Client as an expedient in dealing with matters related to its submission.
- G) This report is prepared and written in the context of the proposals stated in the introduction to the report and should not be used in a differing context. Furthermore, new information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Applied Geology for re-assessment and if necessary, re-appraisal.
- H) The survey was conducted and this report was prepared for the sole internal use and reliance of the Client. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Applied Geology. If an unauthorised third party comes into possession of this report they rely on it at their peril and Applied Geology owes them no duty of care and skill.
- I) Ground conditions should be monitored during the construction of the works and the recommendations of the report re-evaluated in the light of this data by the supervising geotechnical or geo-environmental engineers.
- J) Unless specifically stated, the investigation has not taken into account the possible effects of mineral extraction.
- K) The works performed are not a comprehensive site characterisation and should not be construed as being such.
- L) The findings of the geo-environmental risk assessment are based on information obtained from a variety of sources which Applied Geology believe to be correct. Applied Geology cannot and does not guarantee the authenticity or reliability of the information it has relied upon.
- M) The report represents the findings and opinions of experienced geo-environmental consultants. Applied Geology does not provide legal advice and the advice of lawyers may be required.
- N) Conditions at the site are subject to change from the time of the site inspection.
- O) It is possible that researches carried out by Applied Geology, whilst fully appropriate for a phase 1 desk study, failed to indicate the existence of important information sources. Assuming such indicators actually exist, their information could not have been considered in the formulation of Applied Geology findings and opinions.
- P) The economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, depends on very many factors in addition to geotechnical considerations and hence its evaluation is outside the scope of this report.
- Q) Applied Geology operates as a Consultancy and does not operate its own laboratory for soil testing, this work being sub contracted to known and respected, generally UKAS accredited, laboratories. Applied Geology can therefore not be held responsible for the testing carried out.

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APPENDIX A



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Client:

SEVA PATIDAR LTD

Project:

LAND ADJACENT TO 115 SALES ROAD,
 NORTHERN MOOR

Drawn By:

JS

Checked By:

HH

Paper Size:

A4

Scale:

1:50,000

Date:

14.01.2021

NGR:

381627 390495

Title:

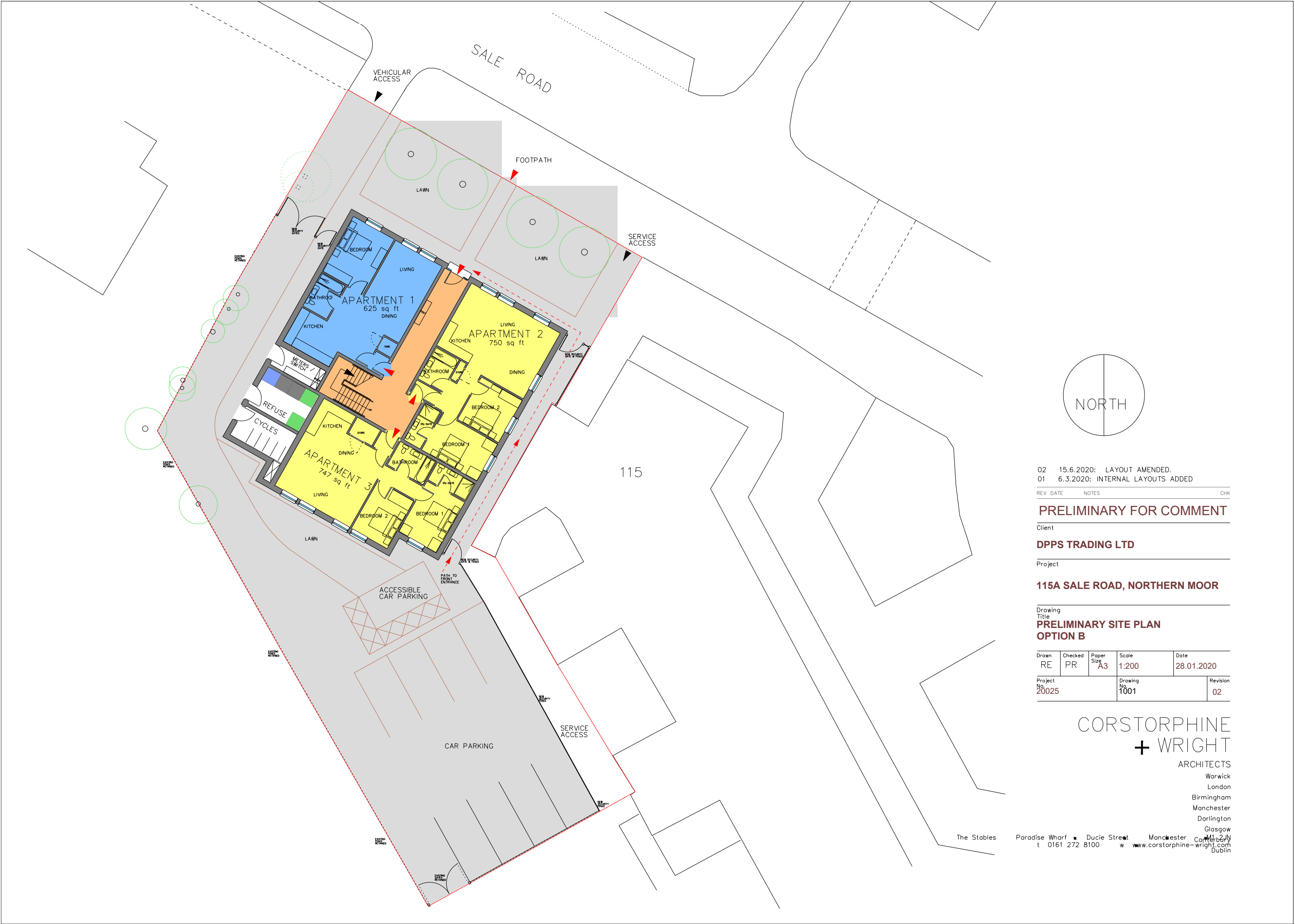
SITE LOCATION PLAN

Drawing No:

AG3225-21-01

Revision:

0



02 15.6.2020: LAYOUT AMENDED.
01 6.3.2020: INTERNAL LAYOUTS ADDED

REV DATE NOTES CHK

PRELIMINARY FOR COMMENT

Client

DPPS TRADING LTD

Project

115A SALE ROAD, NORTHERN MOOR

Drawing

Title

PRELIMINARY SITE PLAN
OPTION B

Drawn RE	Checked PR	Paper Size A3	Scale 1:200	Date 28.01.2020
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Project No. 20025	Drawing No. 1001	Revision 02
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CORSTORPHINE
+ WRIGHT

ARCHITECTS

Warwick

London

Birmingham

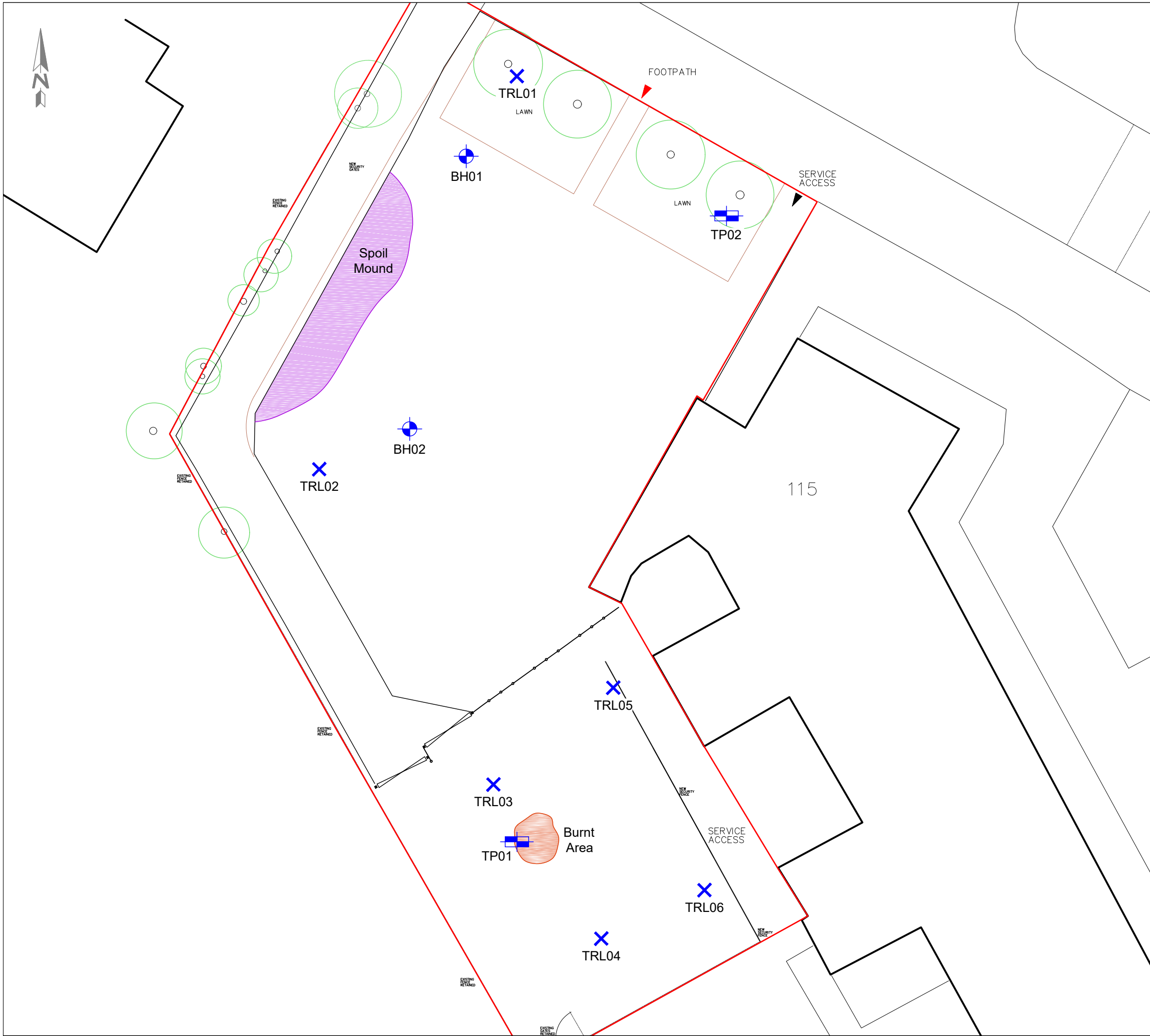
Manchester

Darlington

Glasgow

Edinburgh

Dublin



KEY:

-  Trial Pit
-  Cable Percussion Borehole
-  Transport Research Laboratory Dynamic Cone Penetrometer
-  Spoil Mound (15m x 4m x 1.5m)
-  Burnt area (3m x 3m)

Drawing based on Corstorphine + Wright Architects, drawing No:20025-1001 Rev 2 dated 28/01/2020

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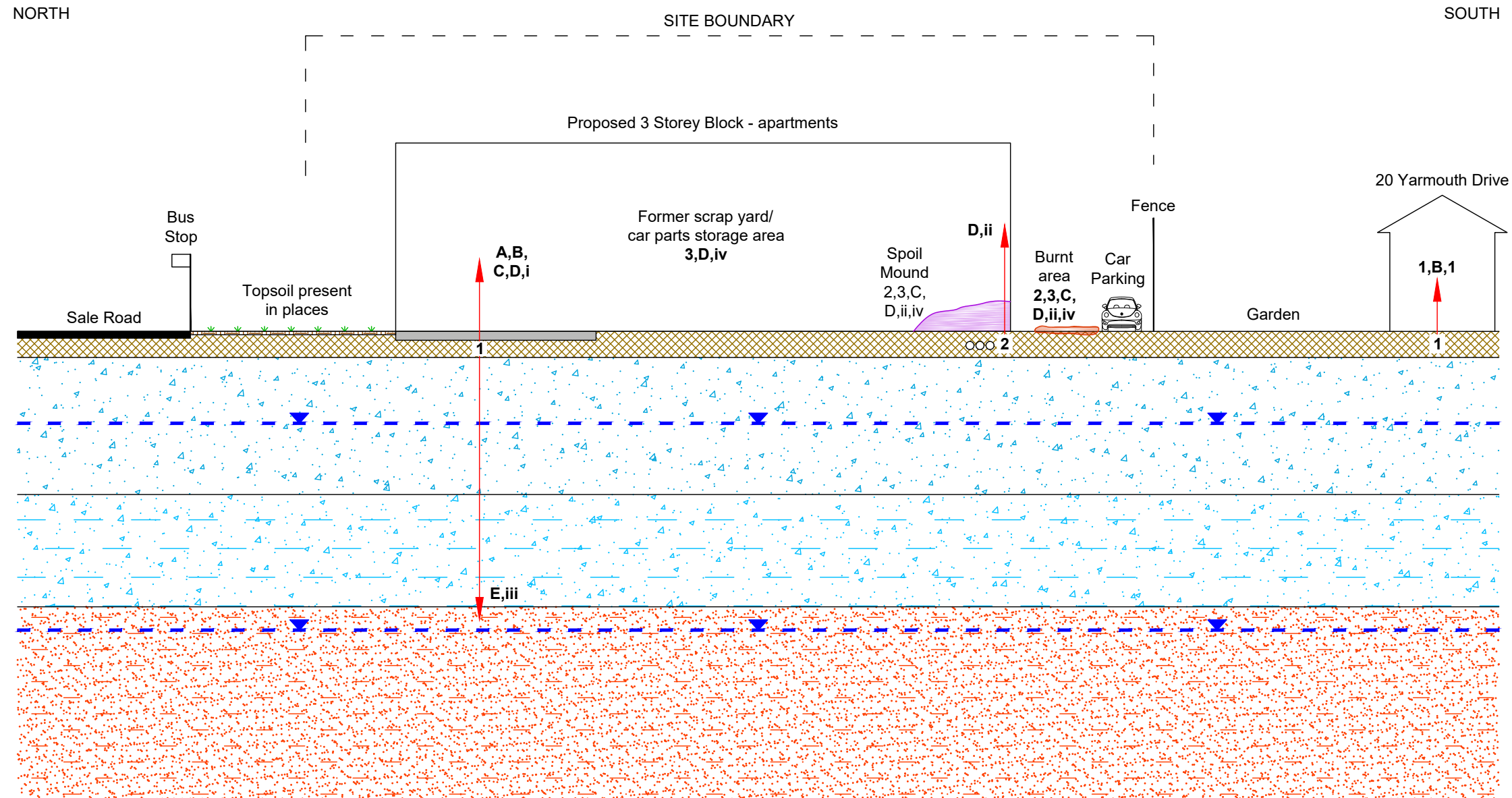
Project:

LAND ADJACENT TO 115 SALE ROAD,
NORTHERN MOOR

Title:

EXPLORATORY HOLE LOCATION PLAN

Drawn By:	JS	Checked By:	HH	Paper Size:	A3
Scale:	NTS		Date:	21.01.2021	
Drawing No:	AG3225-21-02			Revision:	0



SOURCES

1. Made Ground
2. Total Petroleum Hydrocarbons (TPH)
3. Sulphates in Made Ground

PATHWAYS

- A. Inhalation
- B. Ingestion
- C. Dermal contact
- D. Direct contact
- E. Leaching/migration

RECEPTORS

- i. End users (residential/adjacent residents)
- ii. Water supply pipes
- iii. Aquifer
- iv. Buried concrete

Key:



Topsoil



Made Ground



Glaciofluvial Sheet Deposits
(Secondary A Aquifer)



Glacial Till
(Secondary Undifferentiated Aquifer)



Tarporley Siltstone Formation
(Secondary B Aquifer)



Groundwater

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SEVA PATIDAR LTD

Project:

LAND ADJACENT TO 115 SALE ROAD, NORTHERN MOOR

Title:

CONCEPTUAL SITE MODEL

Drawn By:

JS

Checked By:

HH

Paper Size:

A3

Scale:

NTS

Date:

12.01.2021

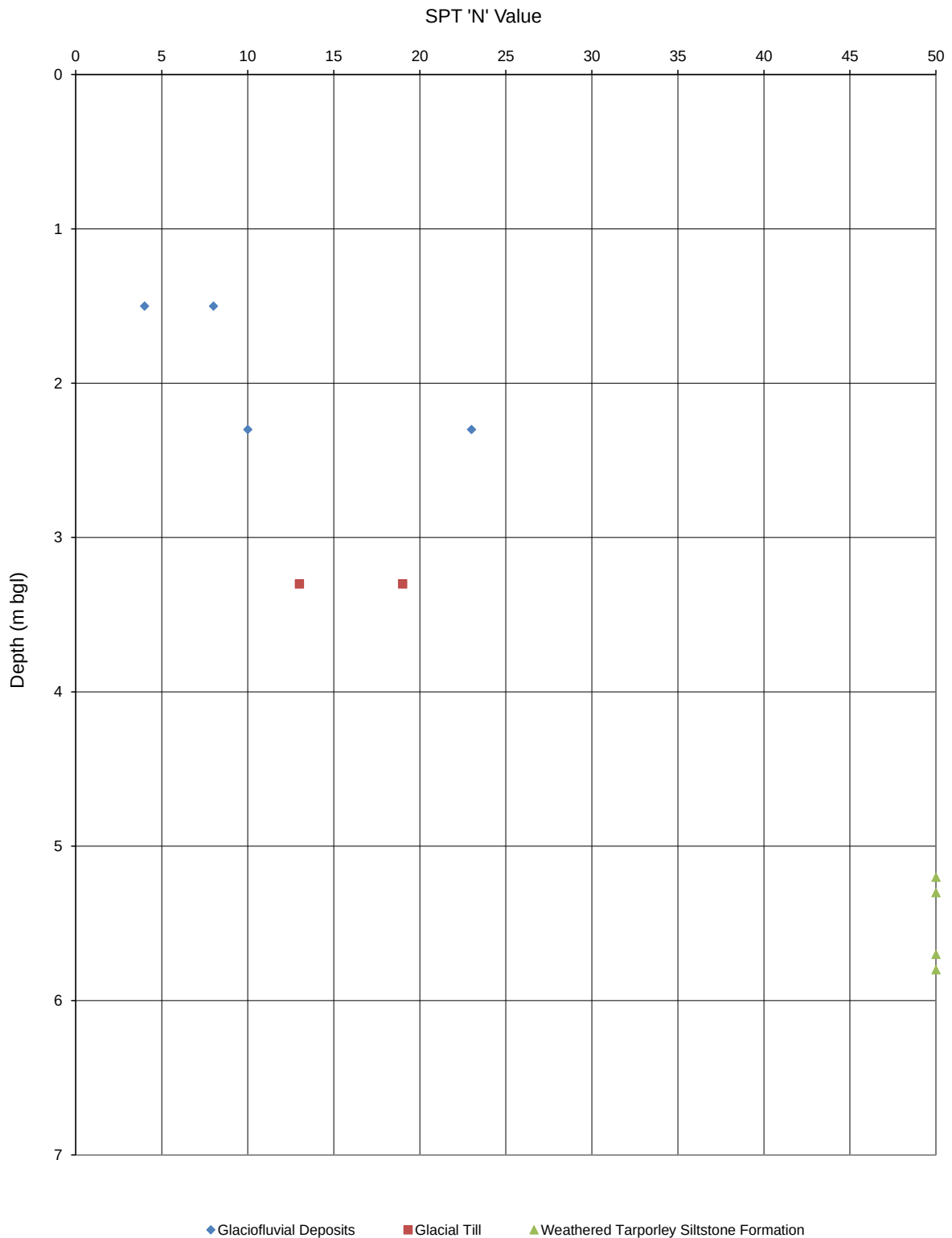
Drawing No:

AG3225-21-03

Revision:

0

Uncorrected SPT 'N' Value versus depth



Notes: 1. Uncorrected N values plotted
 2. Values >50 plotted as 50.

Client:	Seva Patidar Ltd	APPLIED GEOLOGY
Project:	Land adjacent to 115 Sale Road, Northern Moor	
Project No.	AG3225-21	

APPENDIX B

County Series 1:10,560 scale

VEGETATION

	Fir Wood		Deciduous Wood
	Mixed Wood		Brushwood
	Orchard		Reeds
	Rough Pasture		Furze
	Marsh		Osiers

ROADS

	Railway over Road		Road over Railway
	Road over River or Canal		Level Crossing
	Railway over River		Road over Stream
	Road over Stream		Sunken Road
	Raised Road		

RAILWAYS

	Double Lines of Railway		Single Lines of Railway and Tramway
--	-------------------------	--	-------------------------------------

GENERAL FEATURES

	Gravel Pit		Sand Pit
	Quarry		Shingle
	Other Pits		Antiquities, Site of
			Arrow, showing direction of flow of water
			Trigonometrical Station

BOUNDARIES

	County Boundary		Parliamentary Division Boundary
	Parish Boundary		Union Boundary
	Contours		Rural District Boundary

National Grid 1:10,000 scale

HEIGHTS (METRES)

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

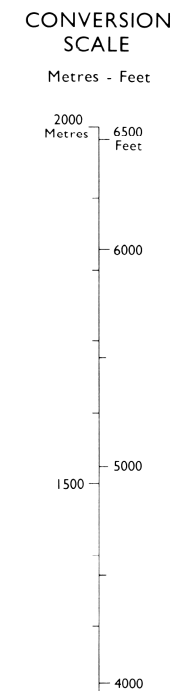
Surface heights determined by { ground survey 163m, air survey 164m }

Bench marks and their values are shown on large scale maps, and bench mark lists containing fuller and possibly later levelling information are obtainable from the Director General, Ordnance Survey.

Contours are at 5 metres vertical interval.

ROCK FEATURES

	Loose rock		Vertical face
	Boulders		
	Outcrop		
	Scree		



ABBREVIATIONS

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

ROADS

	Road		Track		Path
--	------	--	-------	--	------

Where unfenced shown by pecked lines.

RAILWAYS

	Cutting		Embankment	} Standard gauge
	Multiple track			
	Single track			
	Siding, tramway or mineral line			
	Narrow gauge			

GENERAL FEATURES

	Antiquity, (site of)		Lake, loch or pond
	Boulders		Sloping masonry
	Building		= Chalk pit, clay pit or quarry
	Pylon		= Gravel pit
	Pole		= Sand pit
	Glasshouse		Refuse or slag heap
	Triangulation station		

Direction of flow of water

	Shingle
	Sand

VEGETATION

	Bracken, rough grassland		Marsh		Coppice
	Scrub		Saltings		Orchard
	Heath		Reeds		Coniferous trees
					Non-coniferous trees

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



Historical Map Pack Legend

County Series & National Grid

1:10,560 scale

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

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Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1849

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
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Edition 1849
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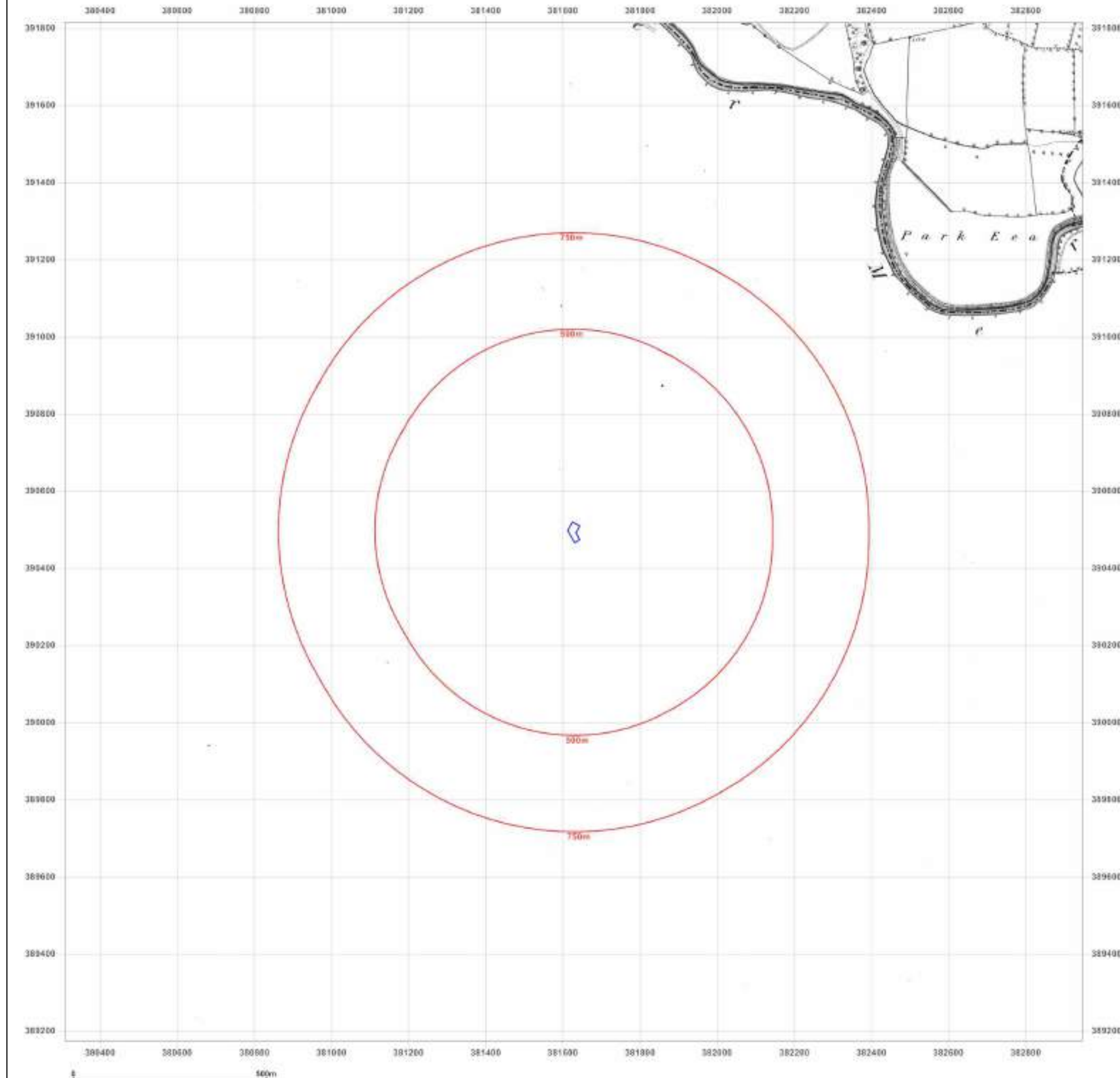


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Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

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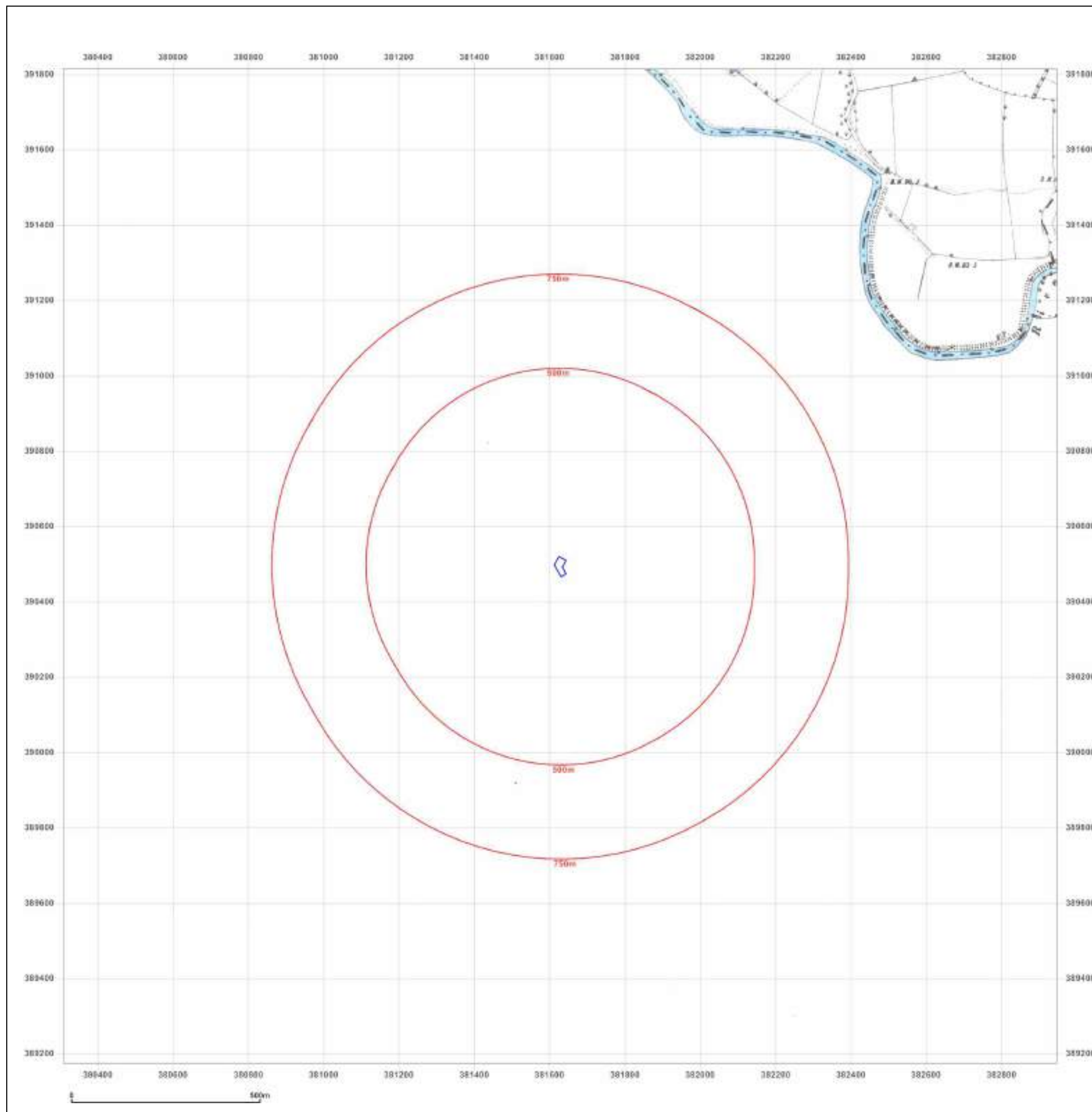


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Production date: 07 January 2021

Map legend available at:
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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1897

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1876
Revised 1897
Edition 1897
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1897
Edition 1897
Copyright N/A
Levelled N/A



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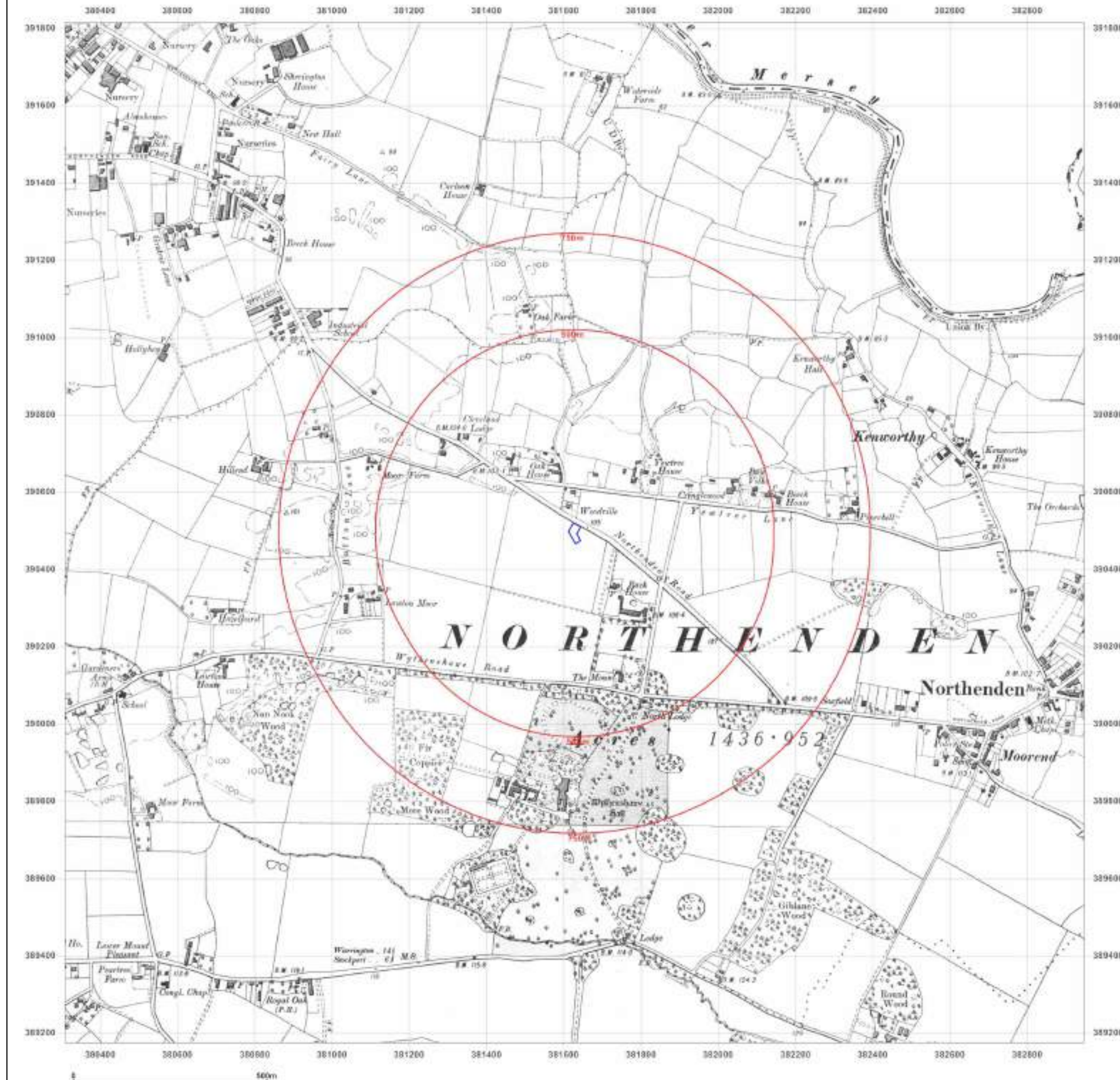


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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1907-1908

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1908
Edition 1908
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Surveyed 1873
Revised 1907
Edition 1907
Copyright N/A
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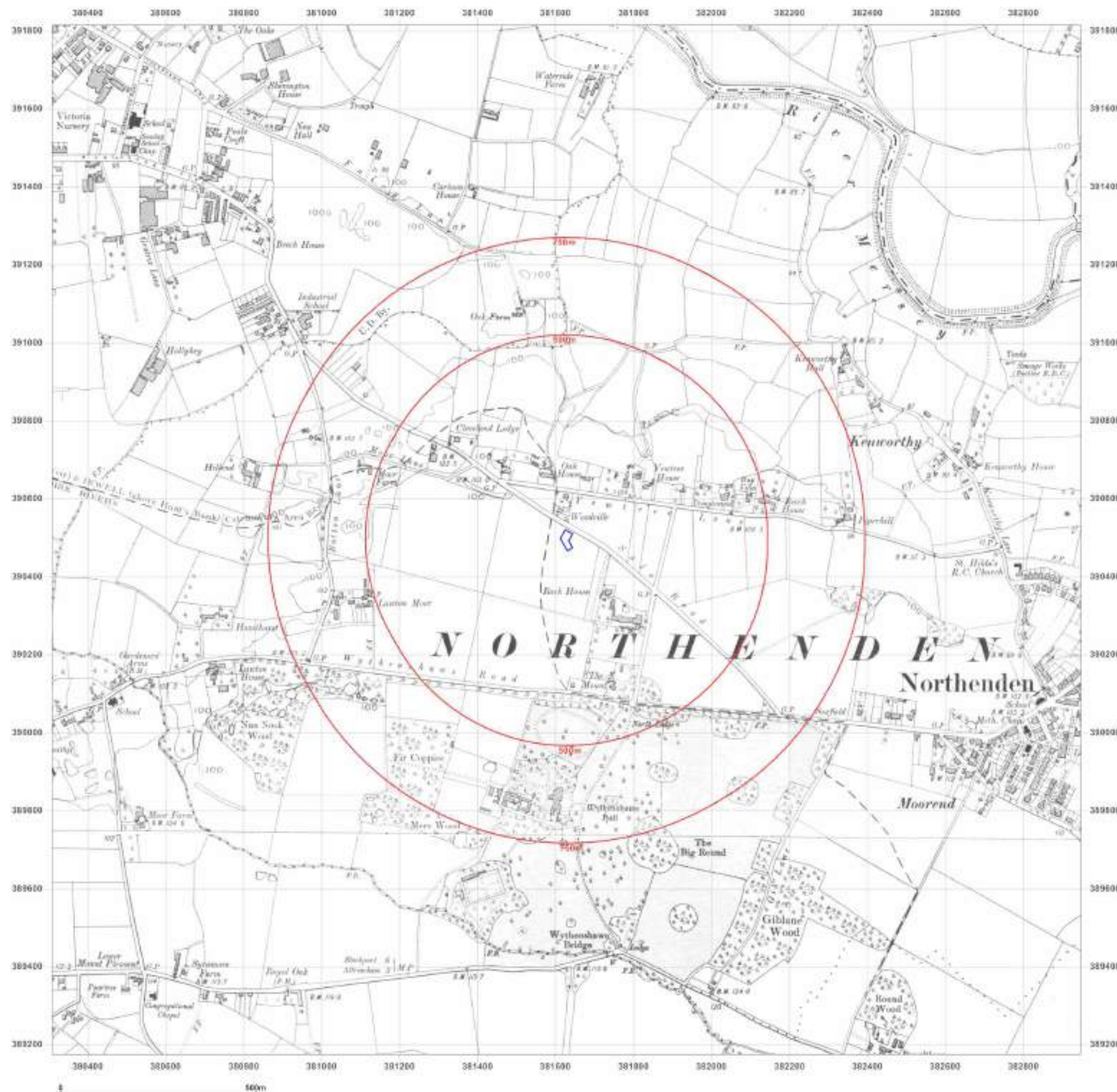


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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1923

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915



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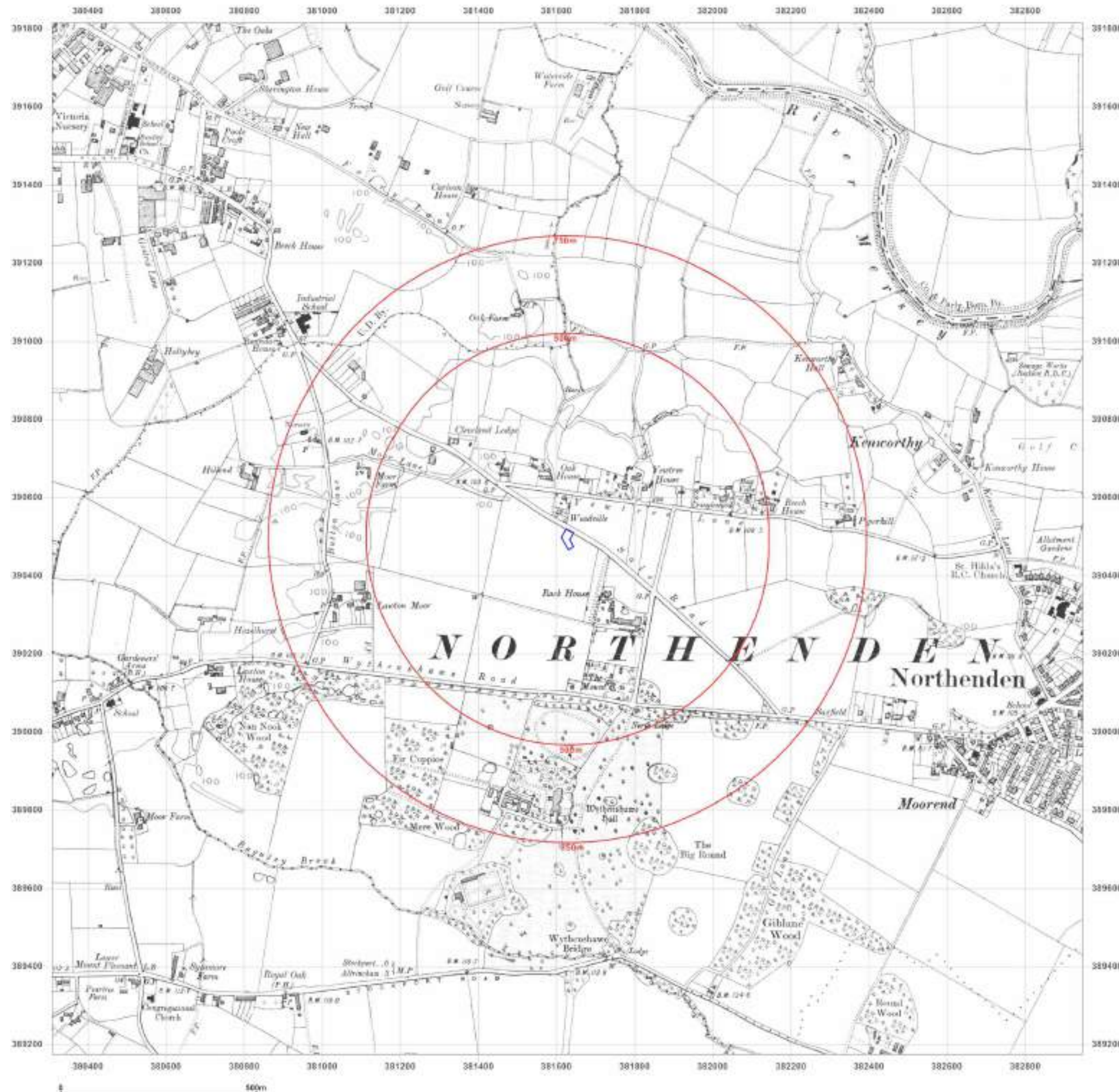


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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1923

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915



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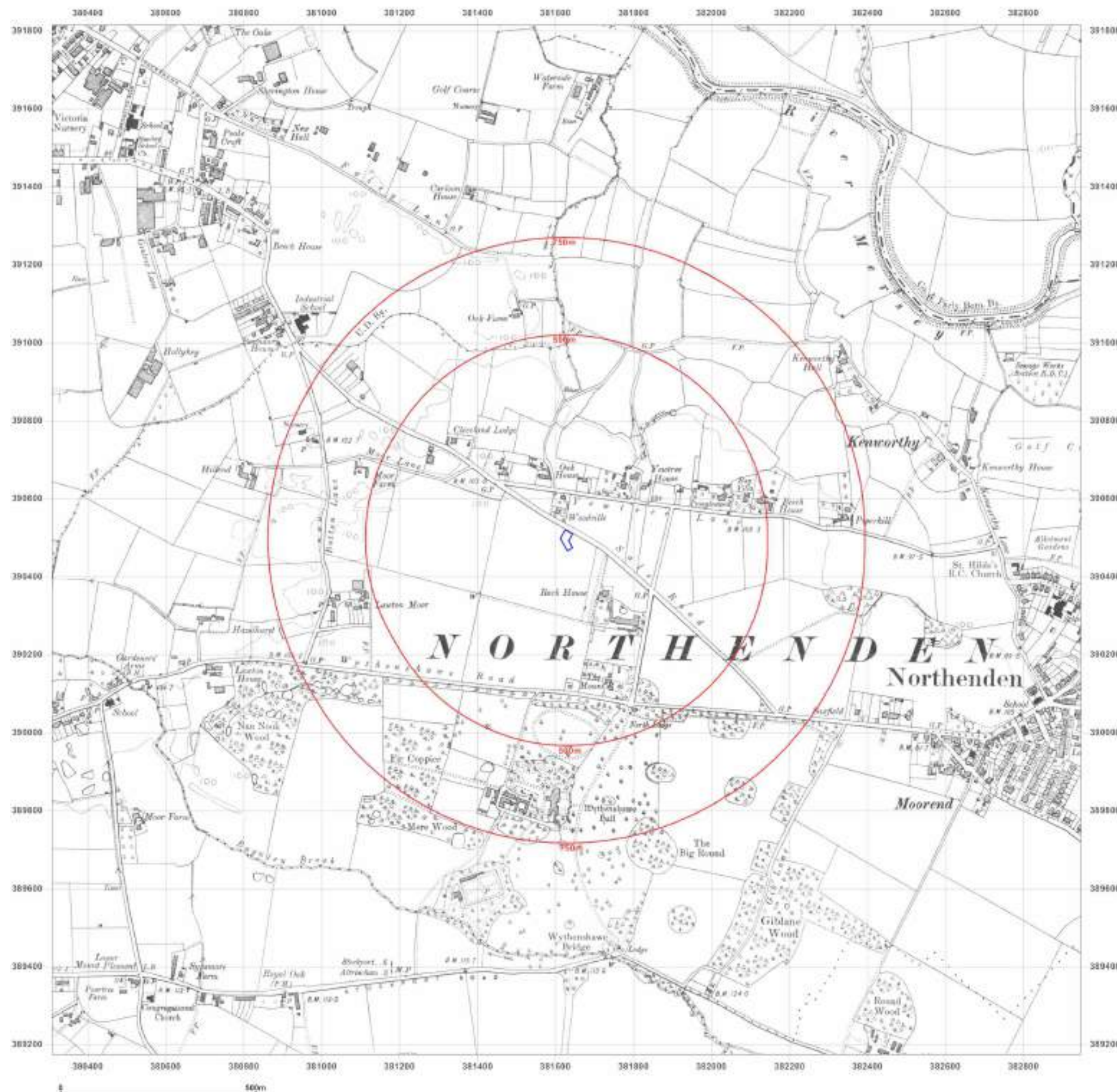


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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1938
Edition 1938
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Levelled N/A

Surveyed 1873
Revised 1938
Edition 1938
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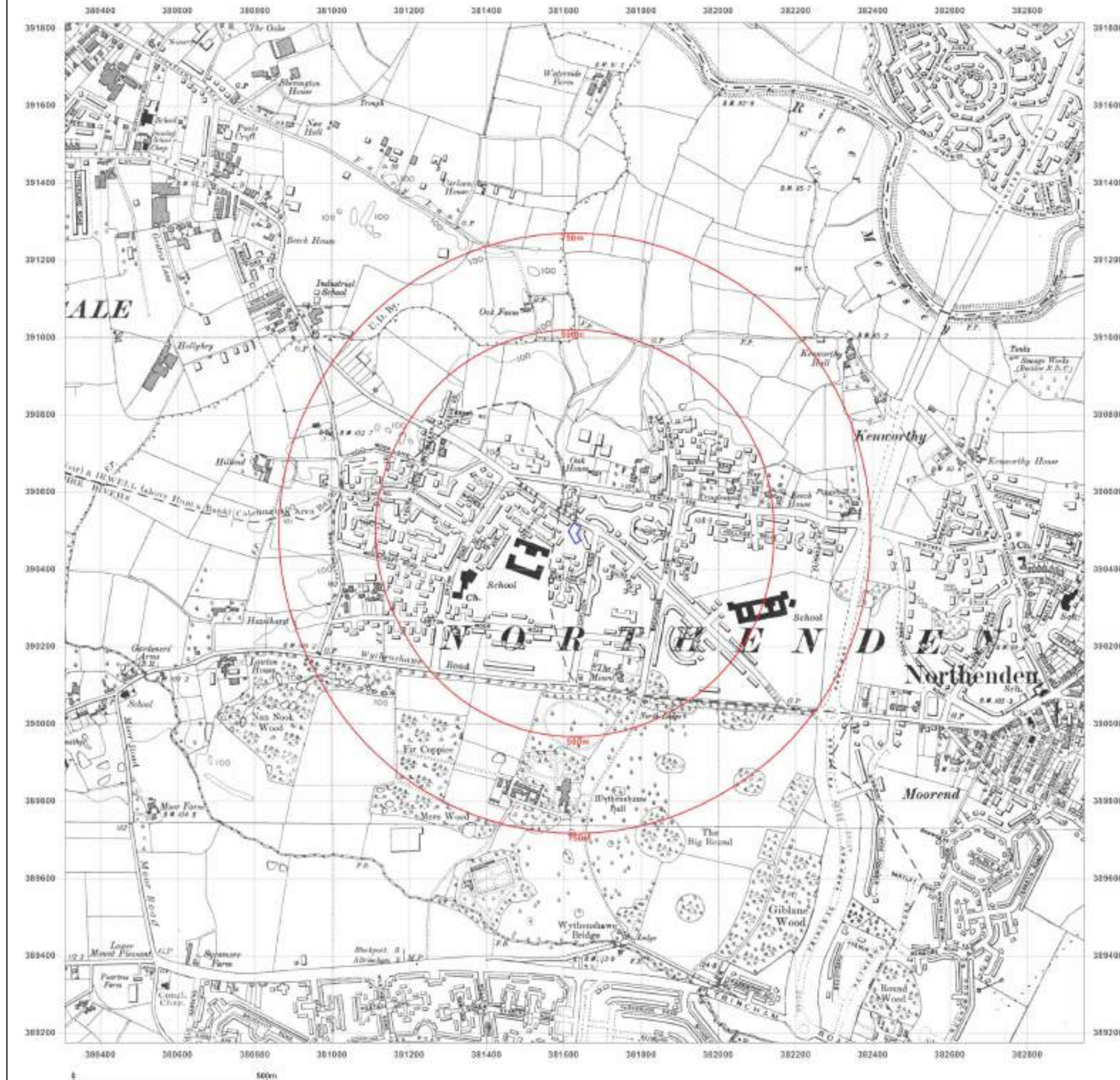


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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: Provisional

Map date: 1966-1967

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1966
Revised 1966
Edition N/A
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Surveyed 1967
Revised 1967
Edition N/A
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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 1977-1981

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1977
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Edition N/A
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Levelled 1978

Surveyed 1975
Revised 1977
Edition N/A
Copyright 1977
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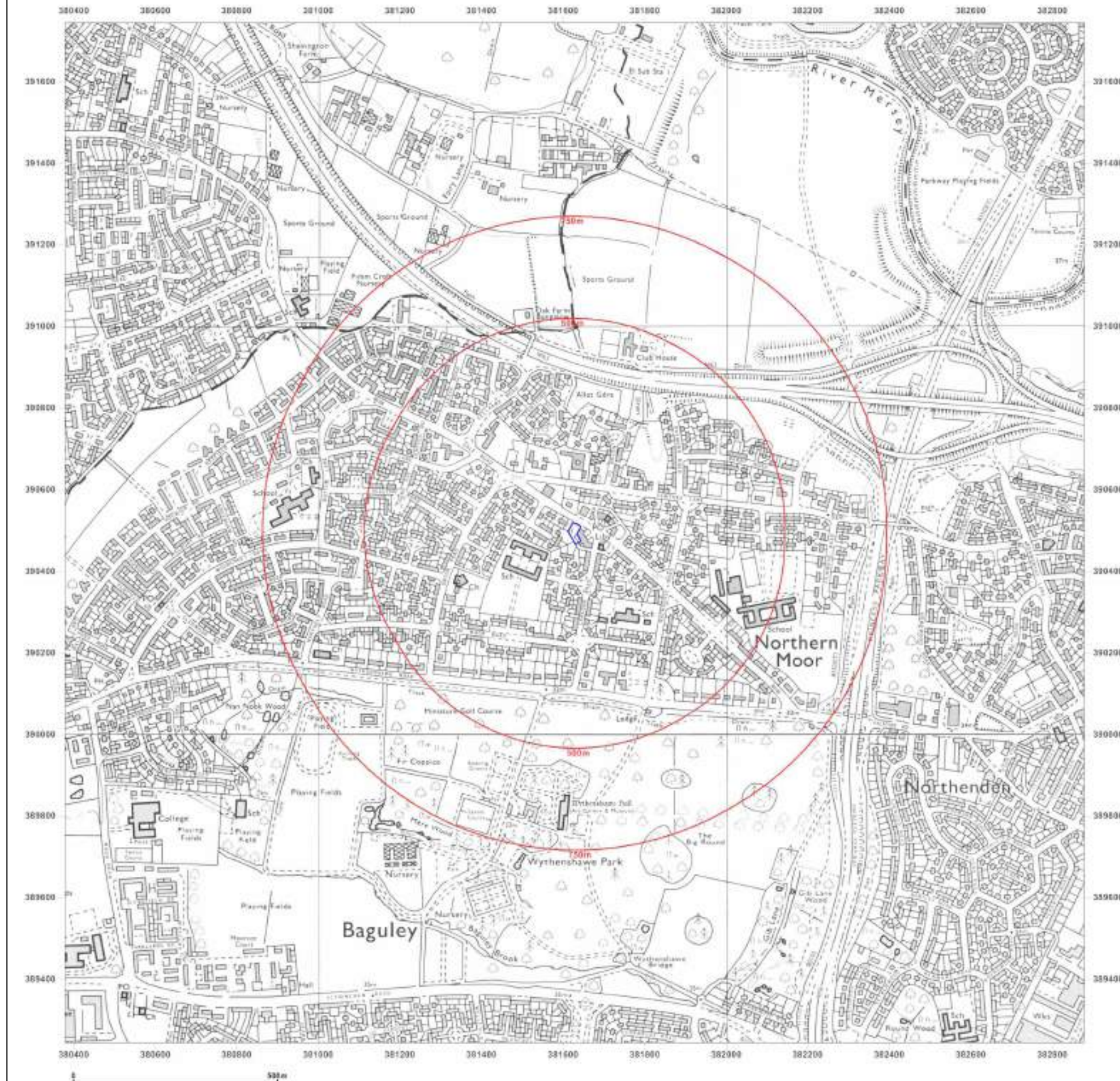


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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 1988-1989

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1985
Revised 1988
Edition N/A
Copyright 1988
Levelled 1981

Surveyed 1984
Revised 1989
Edition N/A
Copyright 1989
Levelled 1981



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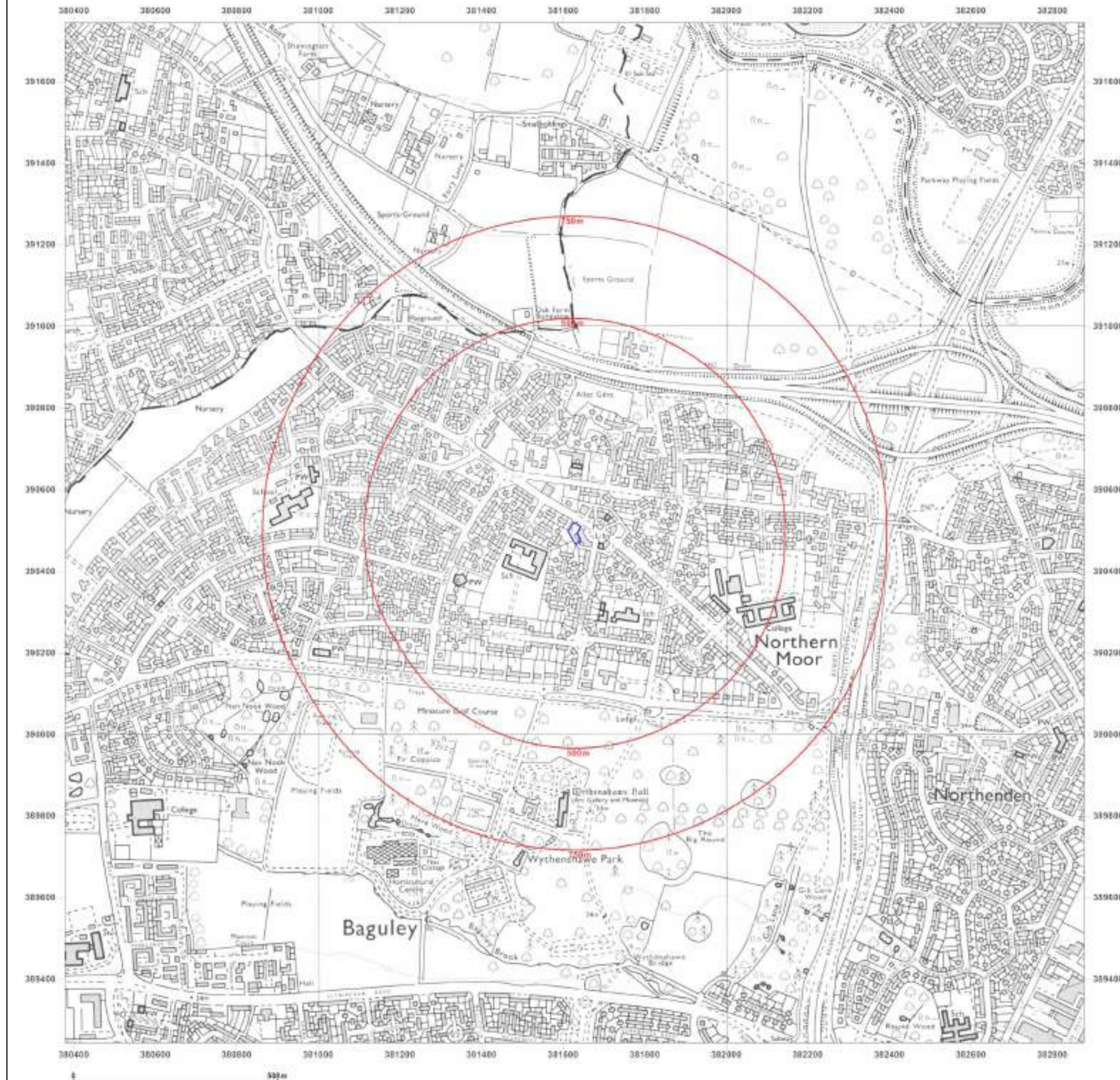


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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 1995

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
Revised 1995
Edition N/A
Copyright 1995
Levelled 1981



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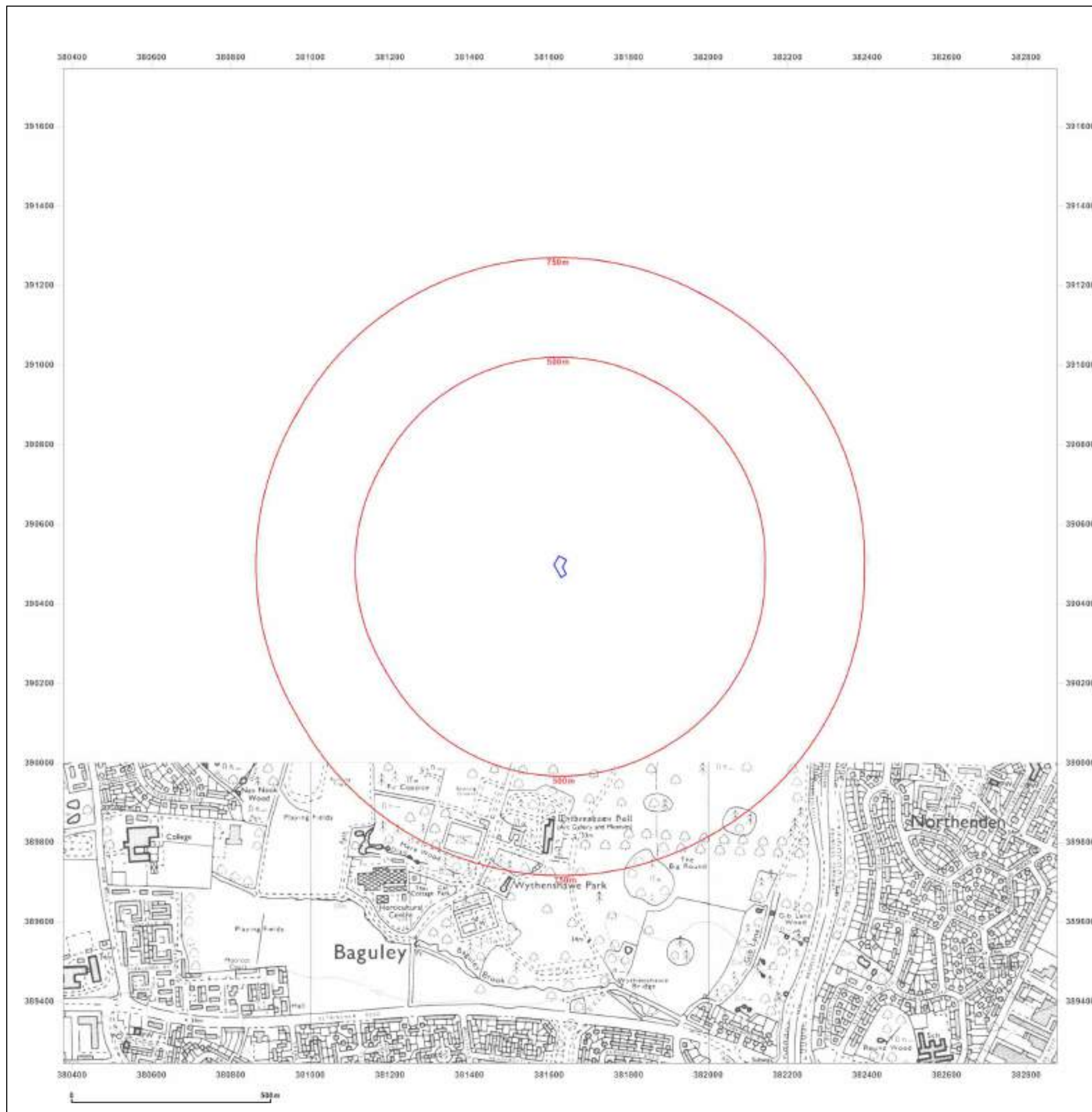


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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



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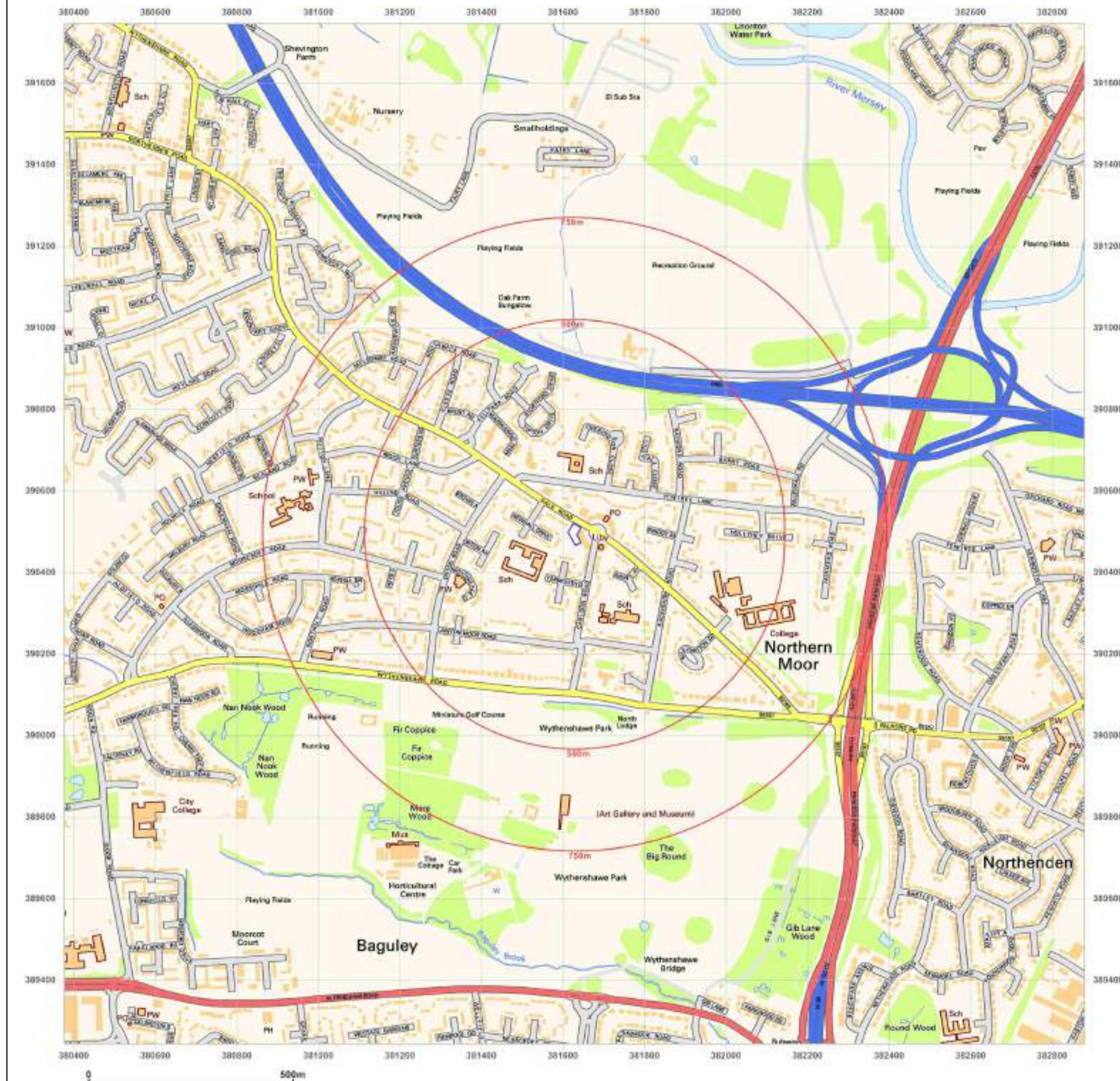


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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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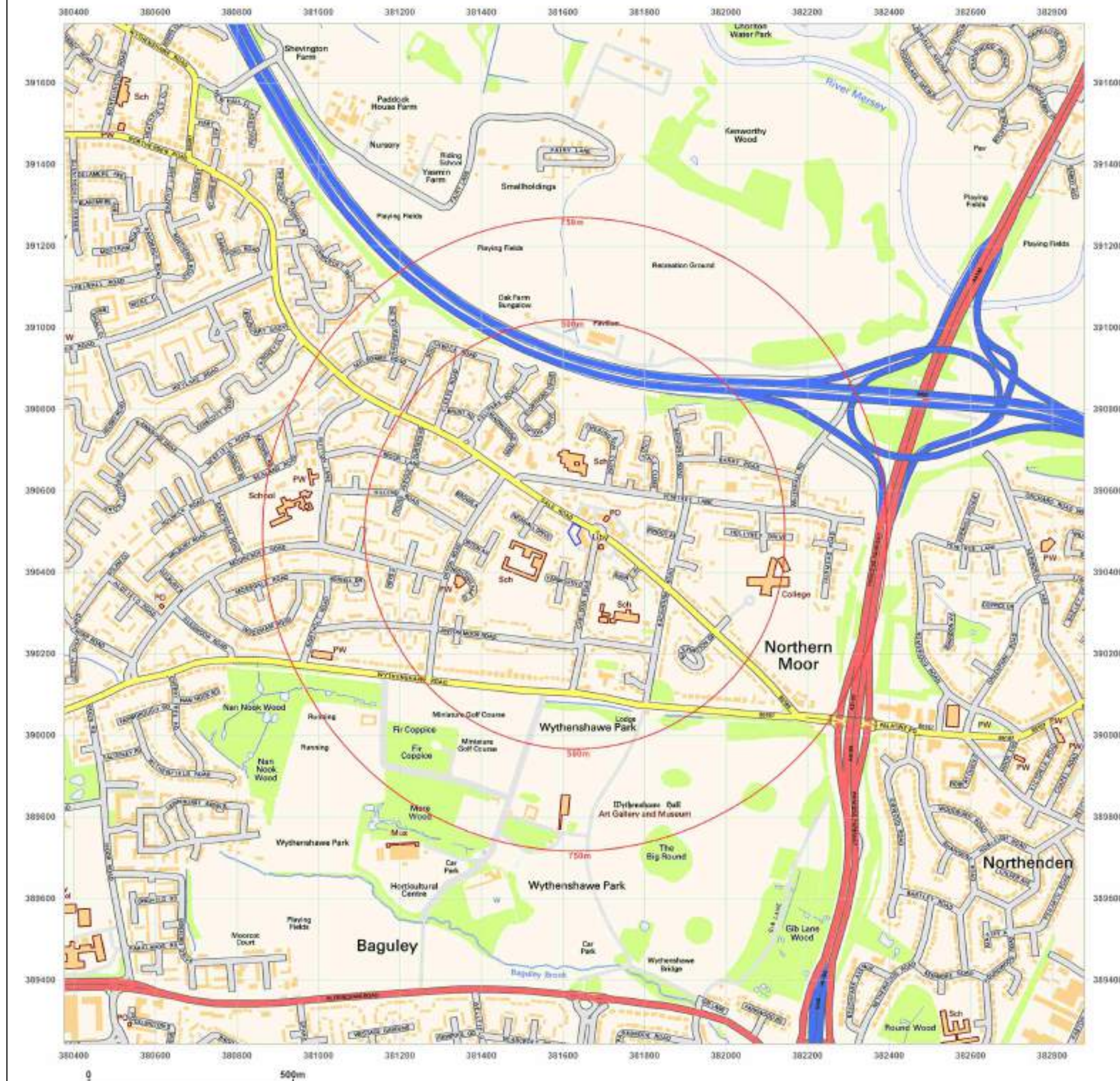


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Site Details:

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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 2021

Scale: 1:10,000

Printed at: 1:10,000



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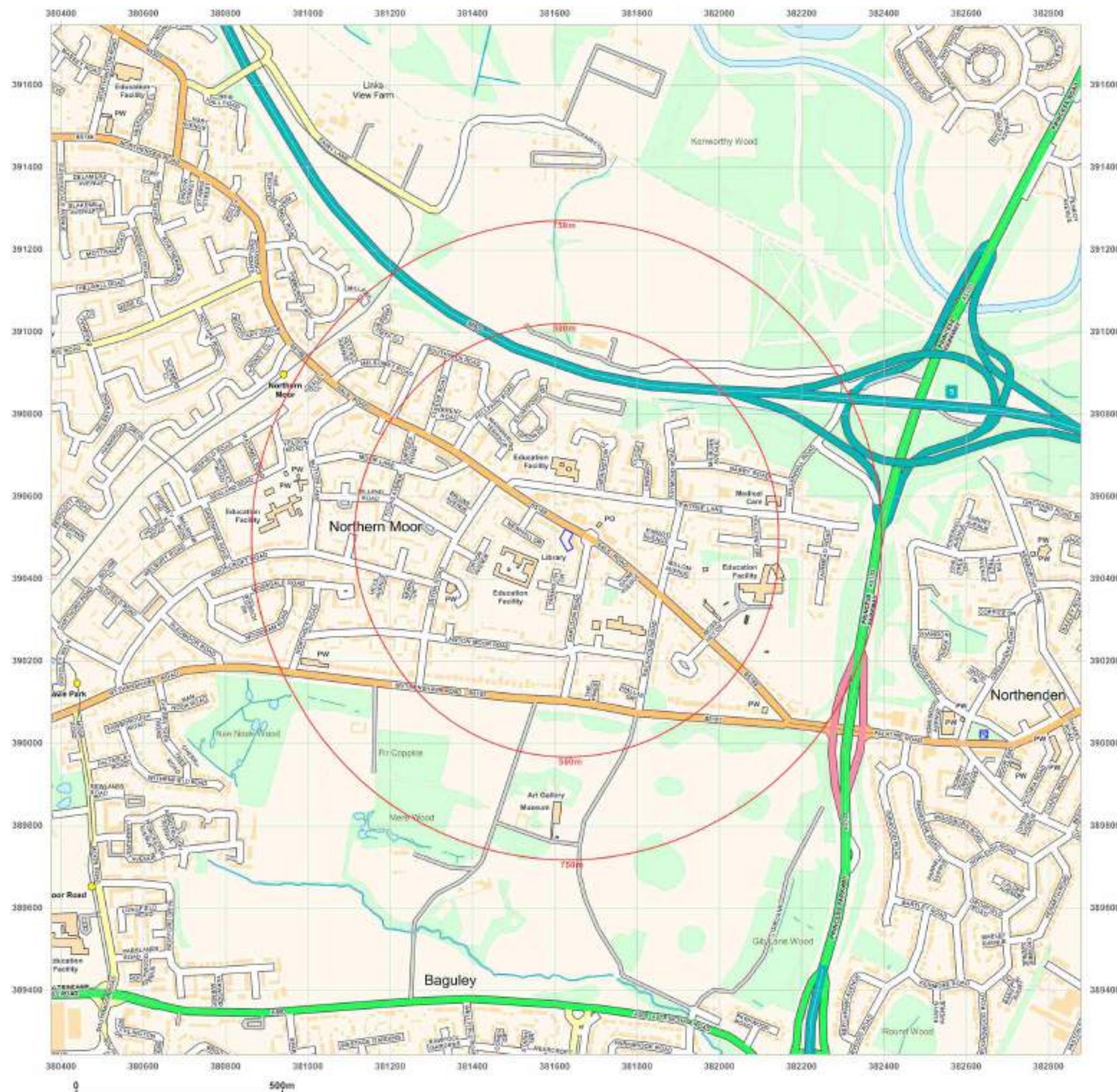


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County Series 1:2,500 scale

National Grid 1:2,500 / 1:1,250 scale



Historical Map Pack Legend

County Series
1:1,250 scale
~

County Series &
National Grid
1:2,500 scale

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Technical Helpline:

Tel 08444159000

groundsureinsight@groundsure.com
www.groundsure.com

GENERAL FEATURES	
	Wood
	Marsh
	Reeds
	Fir
	Mixed Wood
	Brush Wood
	Osiers
	Orchard
	Bush
	Rough Pasture
	Furze
	Ford
	Stepping Stones
	Ferry
	Sloping Masonry
	Flat Rock
	Lock
	Waterfall
	Quarry
	Sand Pit
	Refuse Heap
	Clay Pit
	Shingle
	Gravel Pit
	Trigonometrical Station
	Altitude at Trigonometrical Station
	Bench Mark
	Surface Level
	Permanent Traverse Station
	Antiquities (site of)
	Arrow denotes flow of water
	Sluice
	Trough
	Spring
	Well
	Mooring Ring
	Mooring Post
	Boundary Stone
	Boundary Post

ROADS	
	Road over single stream
	Road crossing railway
	Road over River or Canal
RAILWAYS	
	Railway crossing River or Canal
	Railway crossing Road
	Level Crossing
	Embankment
	Cutting

ABBREVIATIONS	
	Trigonometrical Station
	Altitude at Trigonometrical Station
	Bench Mark
	Surface Level
	Permanent Traverse Station
	Antiquities (site of)
	Arrow denotes flow of water
	Sluice
	Trough
	Spring
	Well
	Mooring Ring
	Mooring Post
	Boundary Stone
	Boundary Post

GENERAL FEATURES	
	Non-coniferous Trees
	Coniferous Trees
	Surveyed Trees
	Orchard Trees
	Copple, Osier
	Scrub
	Bracken
	Heath
	Rough Grassland
	Marsh, Saltings
	Reeds
	Slopes
	Cliff
	Cave Entrance
	Rock
	Boulders
	Sloping Masonry
	Roofed Building
	Glasshouse
	Archway
	Change of boundary marking
	AREA notes
	Antiquity (site of)
	Culvert
	Direction of water flow
	Electricity Pylon
	Electricity Transmission Line
	Triangulation Station
	Traverse Station (permanent)
	Bench Mark
	Surface Level
	Revision Point (instrumentally fixed)
	Revision Point & Bench Mark coincident
	Top
	Slopes
	Quarry
	Refuse Heap
	Sloping Masonry
	Flat Rock
	Sand
	Sand Pit
	Culvert
	Archway
	Shingle
	Boulders
	Gravel Pit
	Cliff Face
	Glazed Roof Building

BOUNDARIES	
England & Wales	
	County Boundary (geographical)
	County & Civil Parish Boundary coterminous
	Admin County or County Borough Boundary
	London Borough Boundary
	County District Boundaries based on civil parish
England, Wales & Scotland	
	Civil Parish Boundary
	Parly & Ward Boundaries based on civil parish
	Parly & Ward Boundaries not based on civil parish
Scotland	
	County Boundary (geographical)
	County Council Boundary
	County of the City Boundary
	Burgh Boundary
	District Council Boundary
	Coincident with parish
	Not with parish

ABBREVIATIONS	
	Beer House
	Bench Mark
	Boundary Post
	Boundary Stone
	Crane
	Club House
	Chimney
	Capstan
	Drinking Fountain
	Dock
	Electricity Pillar or Post
	Electricity Transmission Line
	Fire Alarm
	Fire Alarm Pillar
	Filter Bed, Foot Bridge
	Fundamental Bench Mark
	Flagstaff
	Fire Station
	Guide Post
	Gas Valve Compound
	Hydrant or Hydraulic
	Hectares
	Lecter Box
	Lifeboat Station
	Level Crossing
	Loading Gauge
	Lighthouse
	Lighting Tower
	Metres
	Mean High Water
	Mean High Water Springs
	Mean Low Water
	Mean Low Water Springs
	Mile or Mooring Post
	Mail Pick-up
	Mile Stone
	National Trust
	Normal Tidal Limit
	National Trust for Scotland
	Pillar, Pole or Post
	Public Convenience
	Police Call Box
	Public House
	Post Office
	Pump
	Police Telephone Pillar
	Reservoir
	Road House
	Revision Point
	Stone
	Signal Box
	Signal Light
	Sluice
	Signal Post
	Spring
	Signal Station
	Telephone Call Box
	Telephone Call Post
	Tank or Track
	Trough
	Traverse Station
	Well
	Weighbridge
	Wind Pump
	Works
	Water Point
	Water Tap

Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1874

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1874
Revised 1874
Edition N/A
Copyright N/A
Levelled N/A



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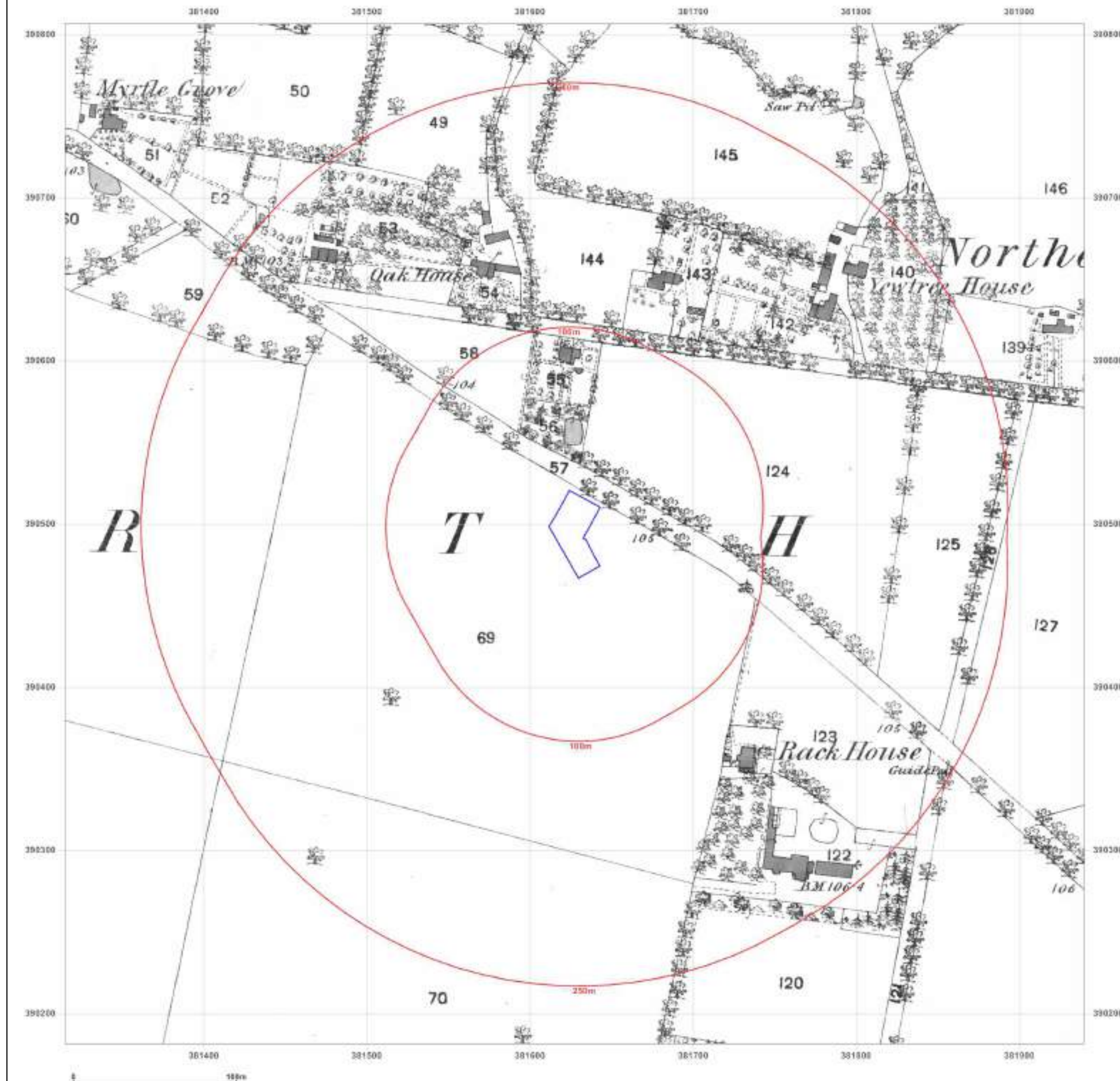


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Site Details:

Sale Road, Northern
Moor, Manchester

Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

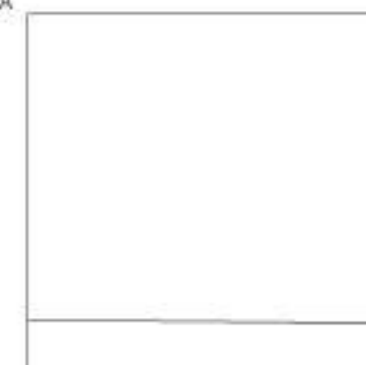
Map date: 1881

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1881
Revised N/A
Edition 1881
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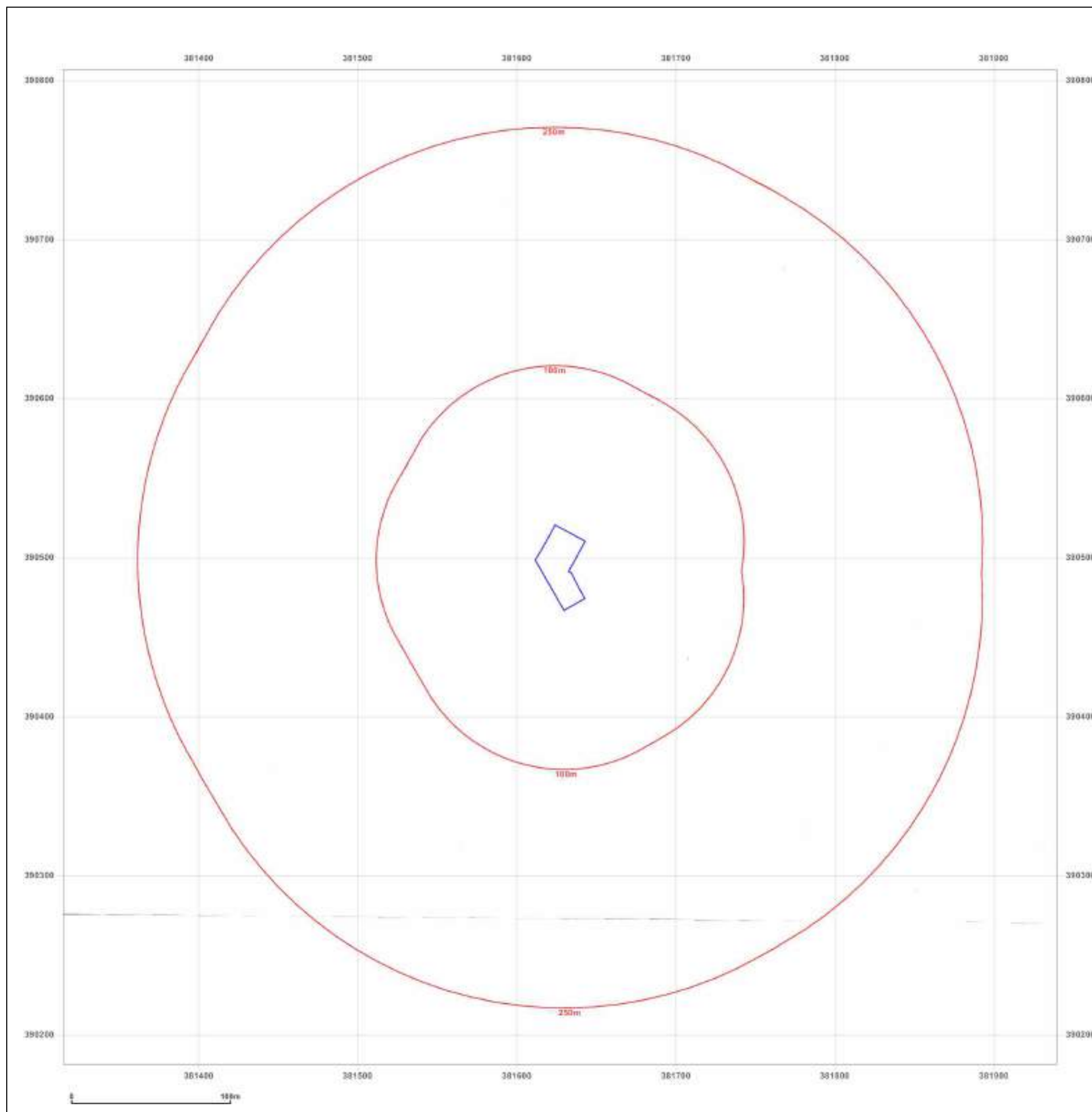


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Site Details:

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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

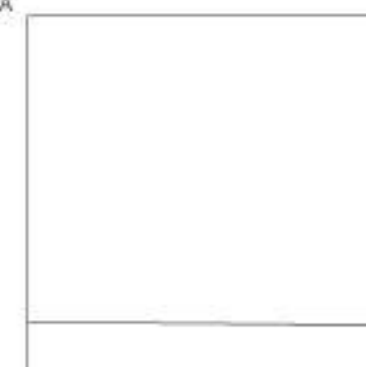
Map date: 1893

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1893
Revised N/A
Edition 1893
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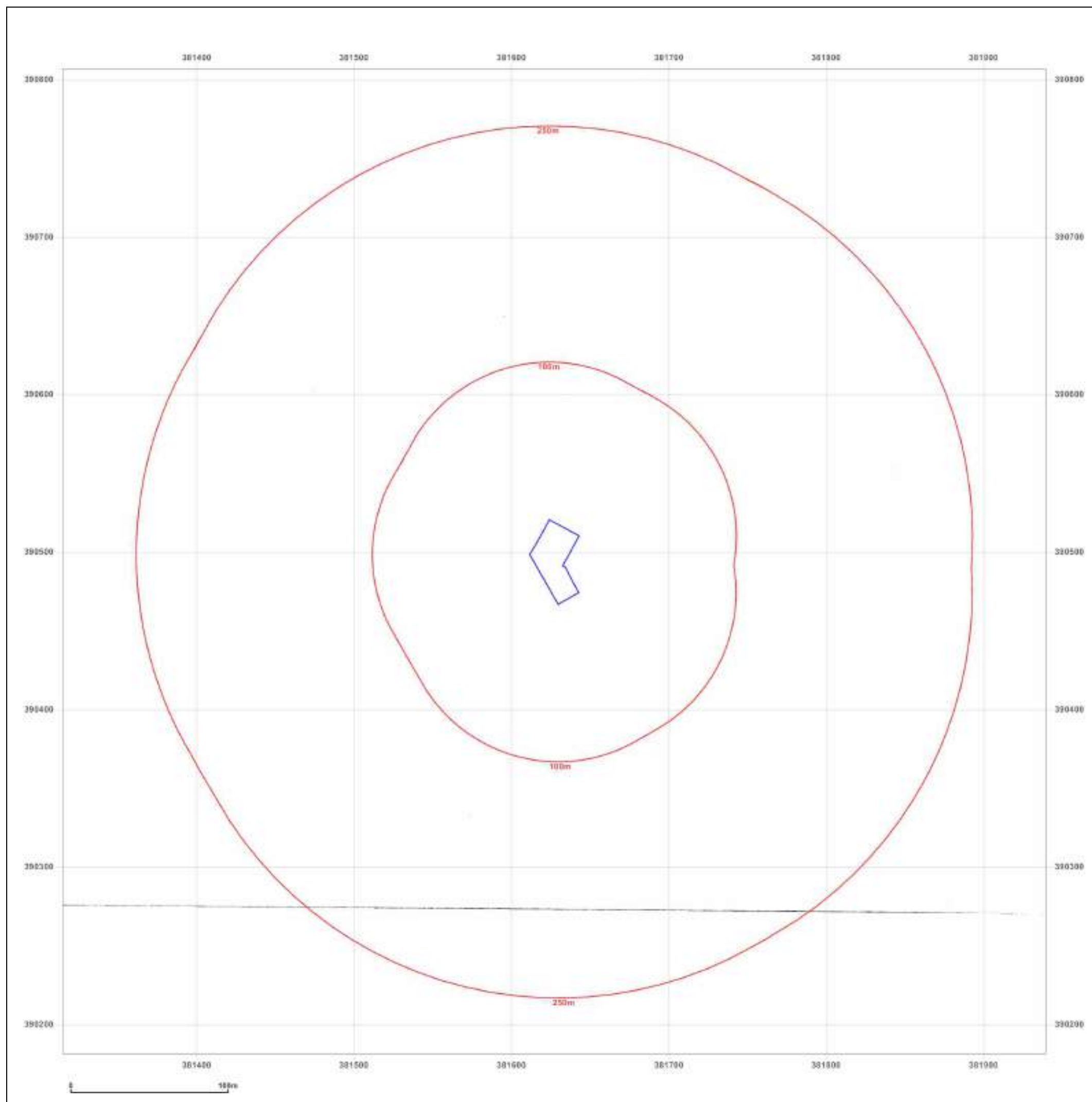


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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1898

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1877
Revised 1897
Edition 1898
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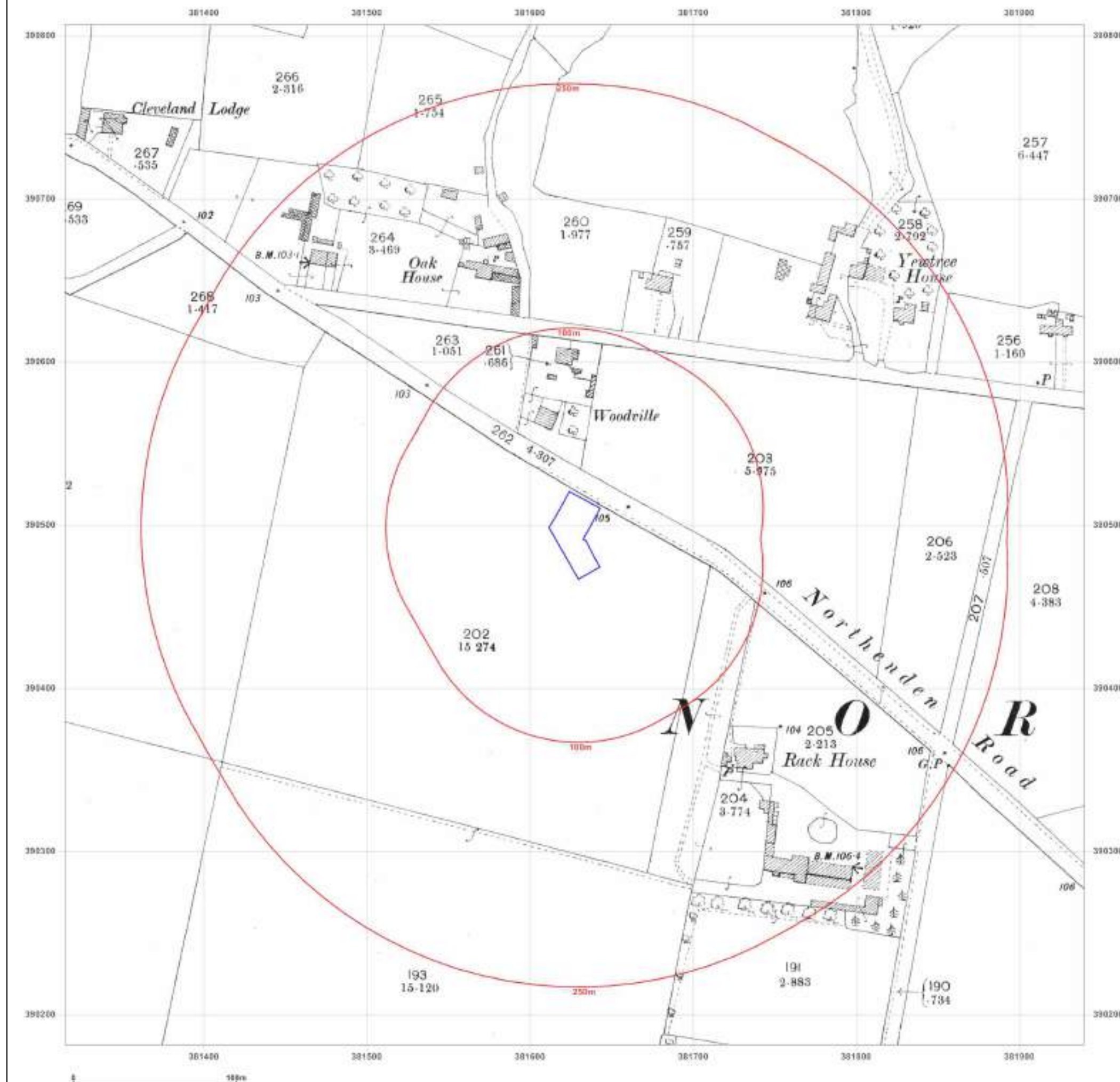


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Site Details:

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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

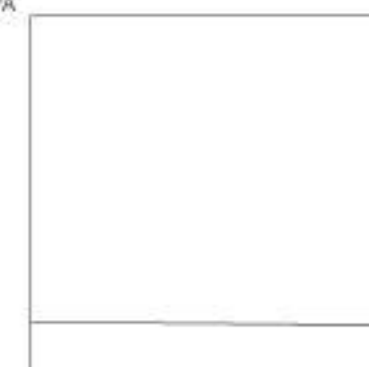
Map date: 1907

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1891
Revised 1905
Edition 1907
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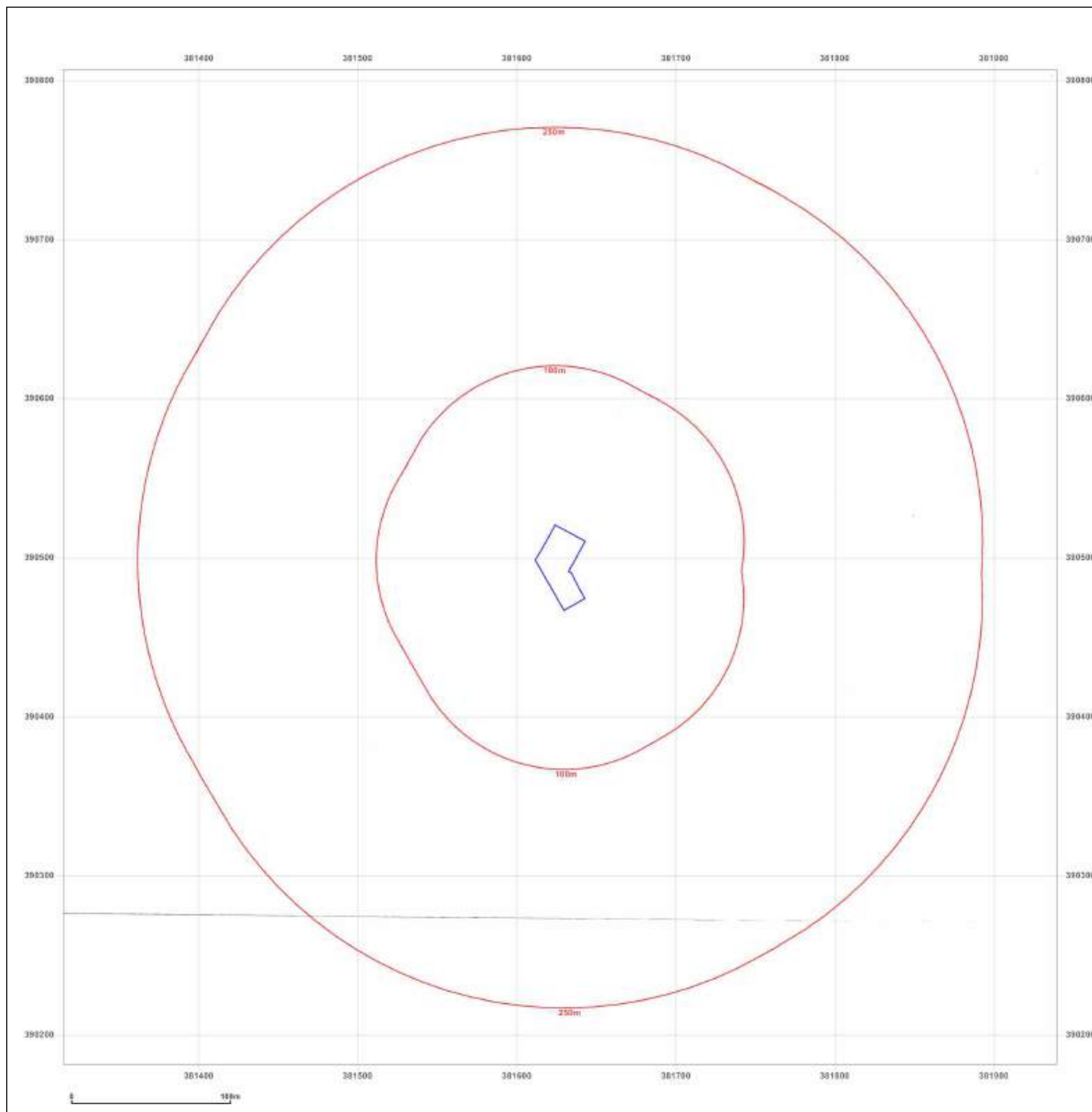


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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1910

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1910
Revised 1908
Edition 1910
Copyright N/A
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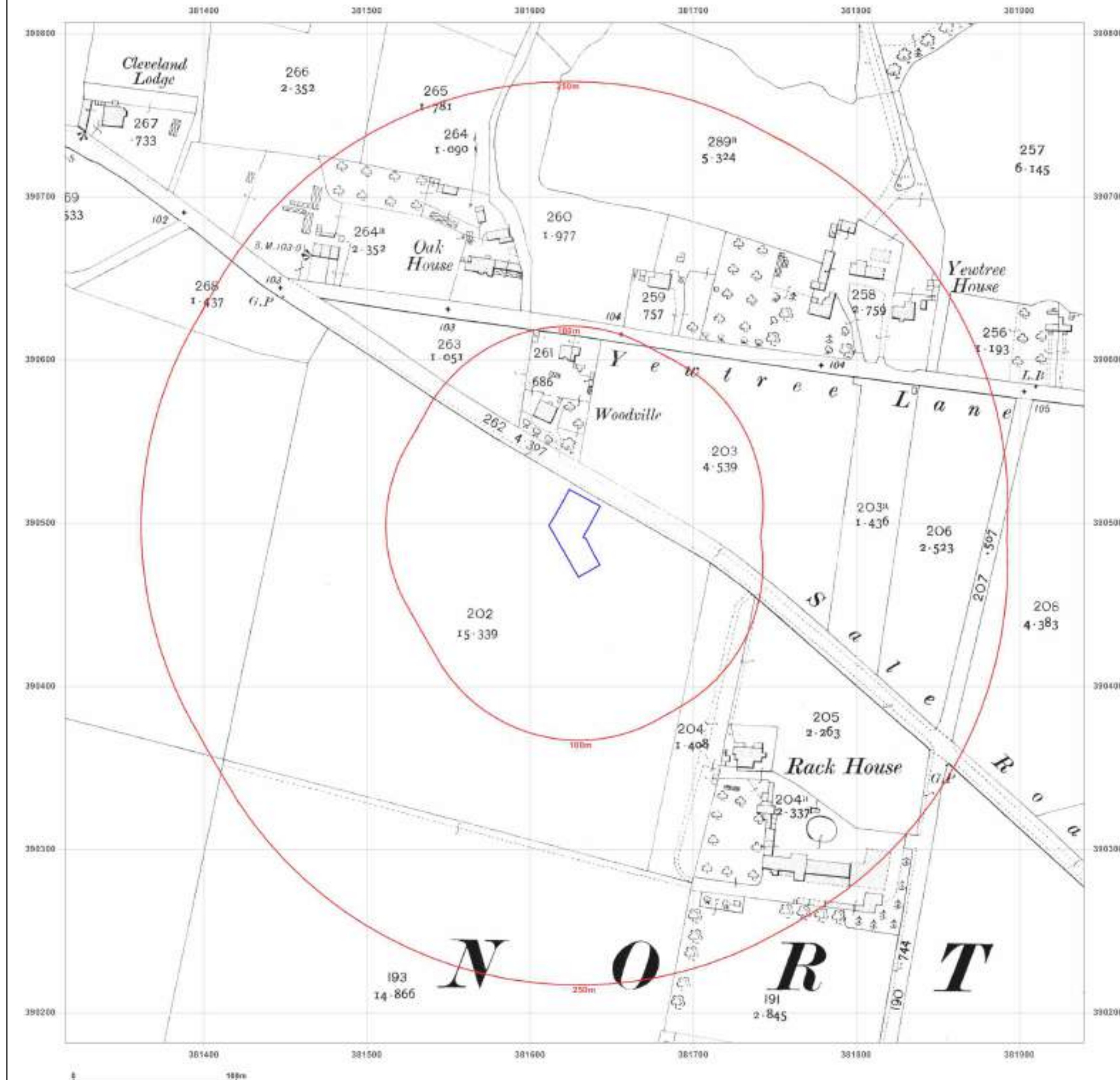


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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1922

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1922
Revised 1916
Edition 1922
Copyright N/A
Levelled 1915

Surveyed 1922
Revised 1916
Edition 1922
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Levelled 1915



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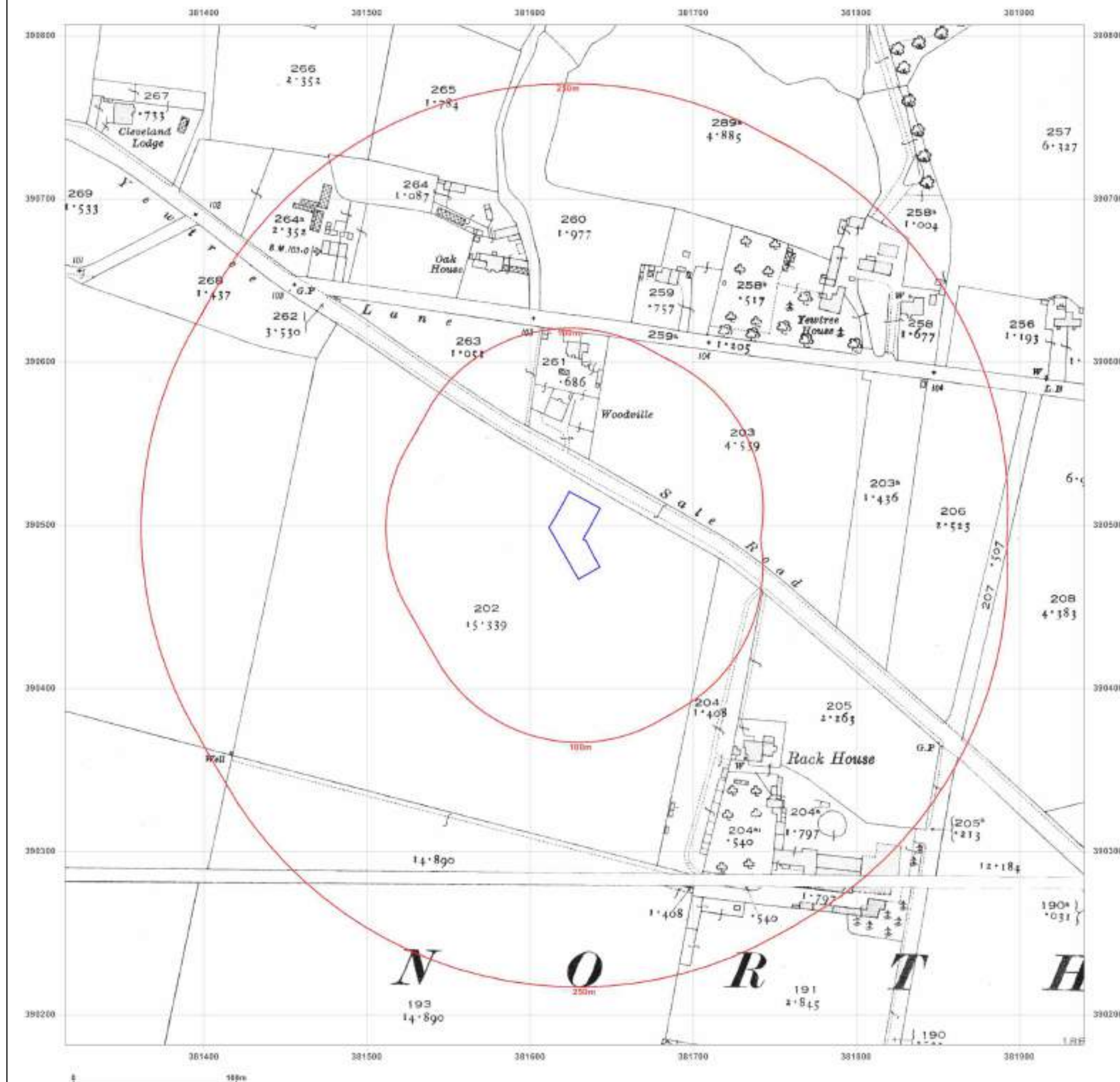


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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1873
Revised 1935
Edition N/A
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Surveyed 1873
Revised 1935
Edition N/A
Copyright N/A
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Site Details:

Sale Road, Northern
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 1955-1956

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1956
Revised 1956
Edition N/A
Copyright N/A
Levelled 1949

Surveyed 1956
Revised 1956
Edition N/A
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Surveyed 1955
Revised 1955
Edition N/A
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Surveyed 1956
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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 1956

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1956
Revised 1956
Edition N/A
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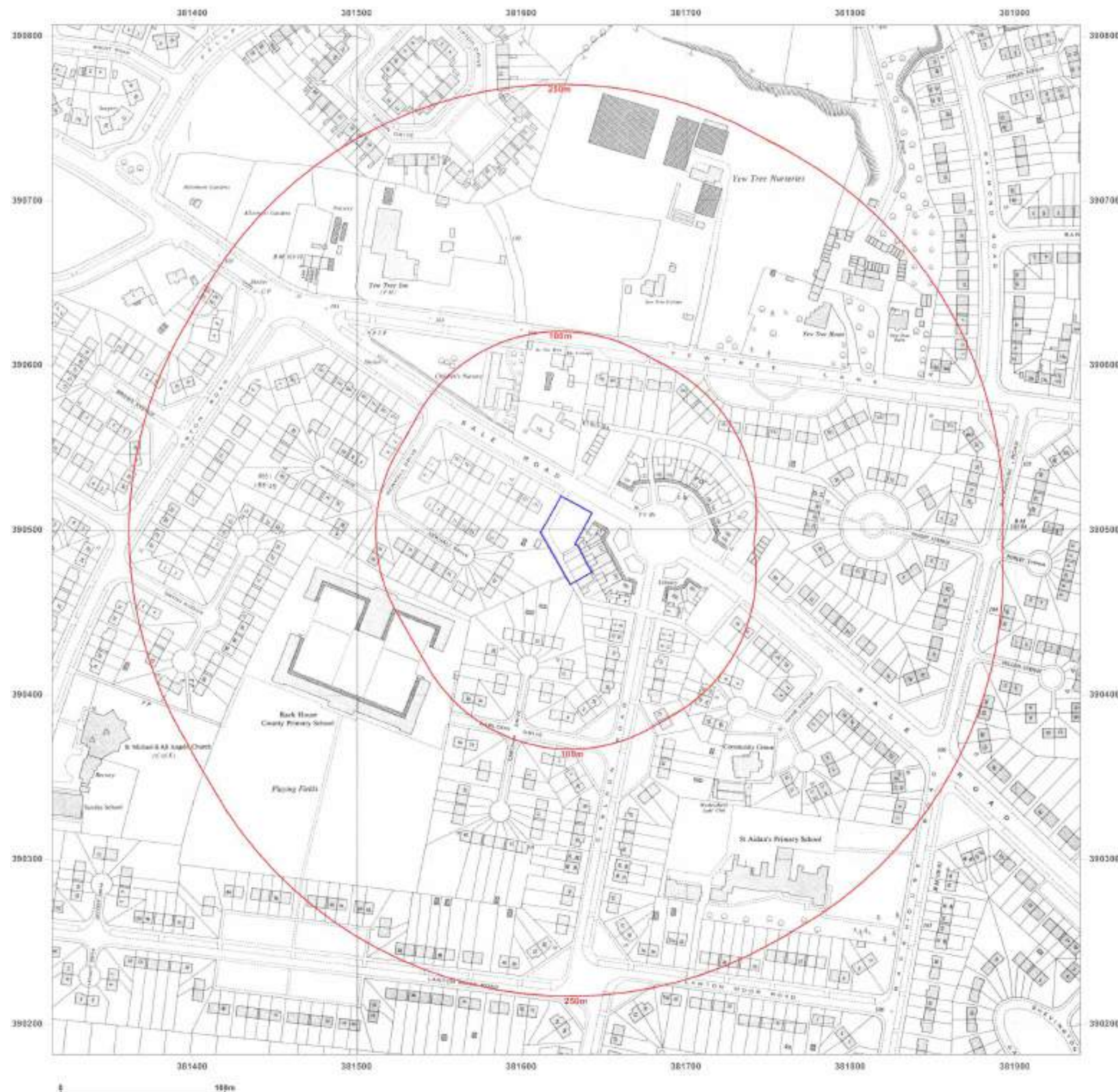


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Client Ref: EMS_660138_870953
Report Ref: EMS-660138_870953
Grid Ref: 381627, 390494

Map Name: National Grid

Map date: 1976

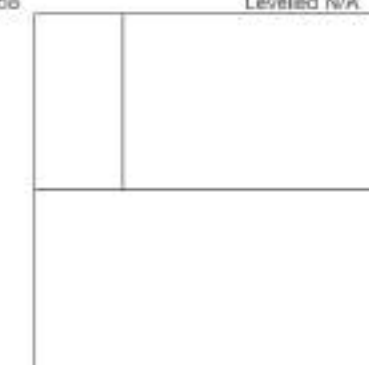
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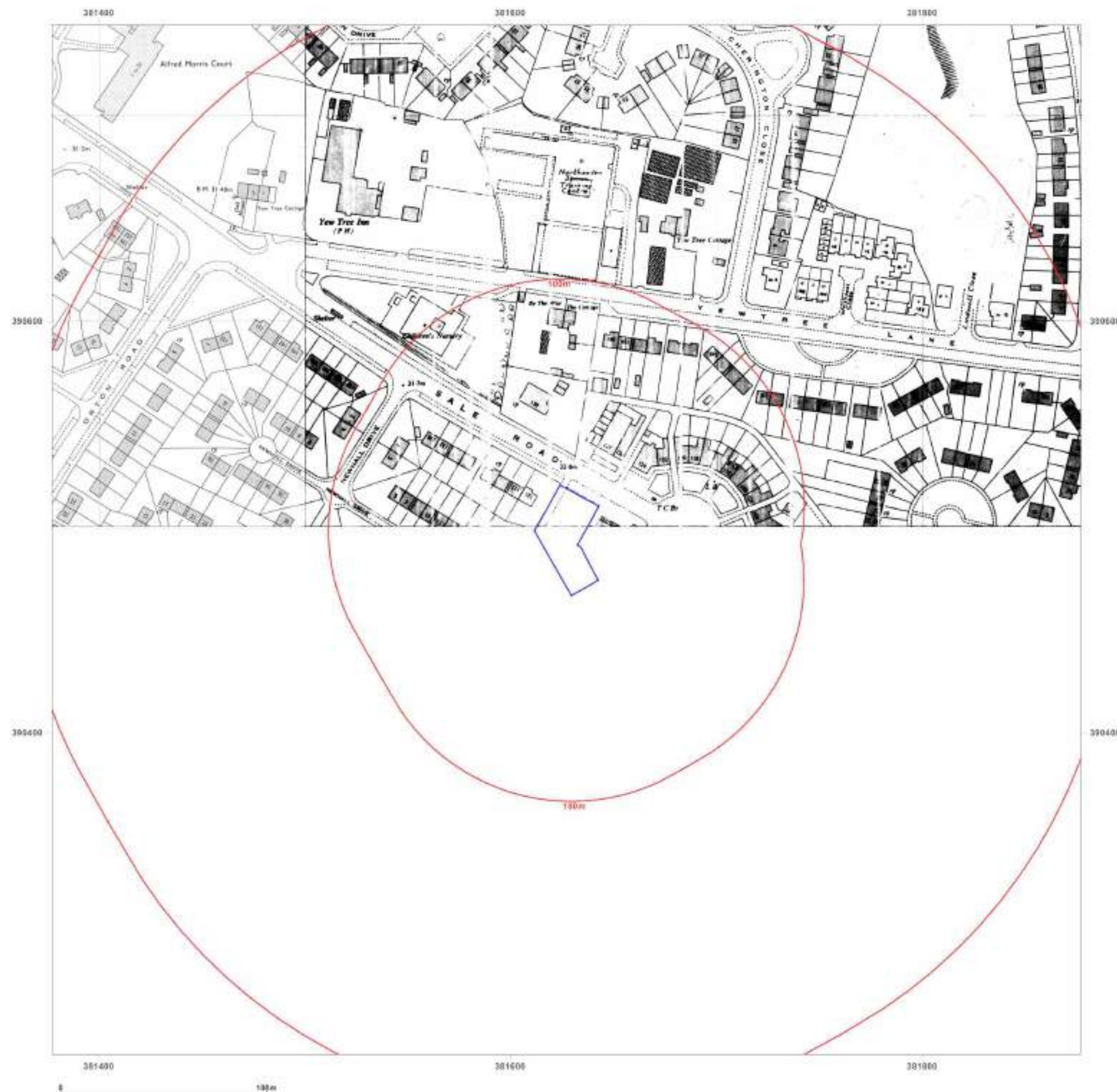


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Grid Ref: 381627, 390494

Map Name: National Grid

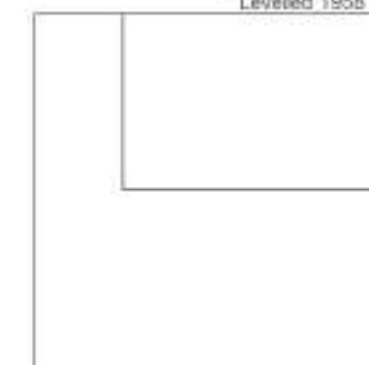
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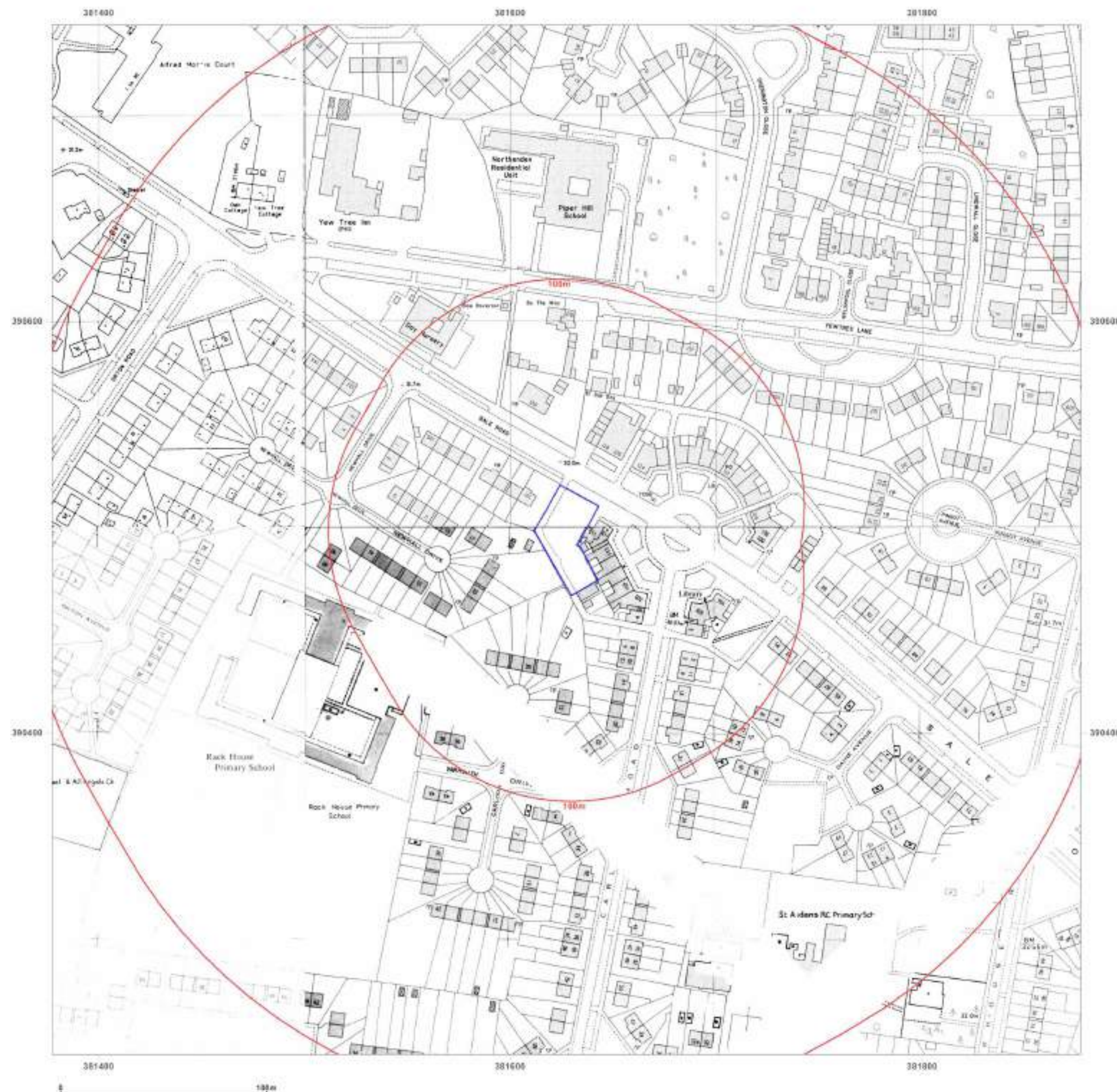


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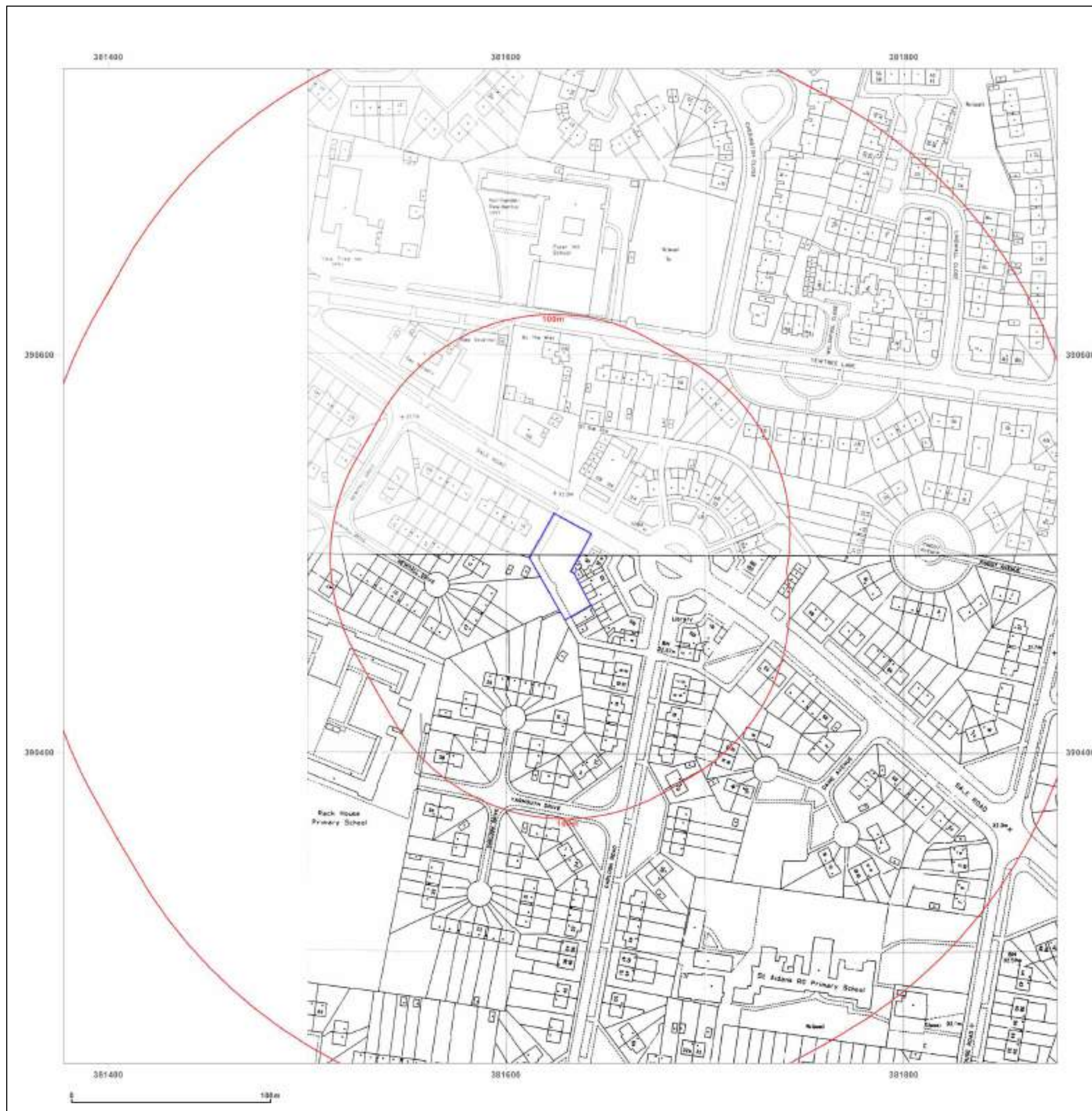


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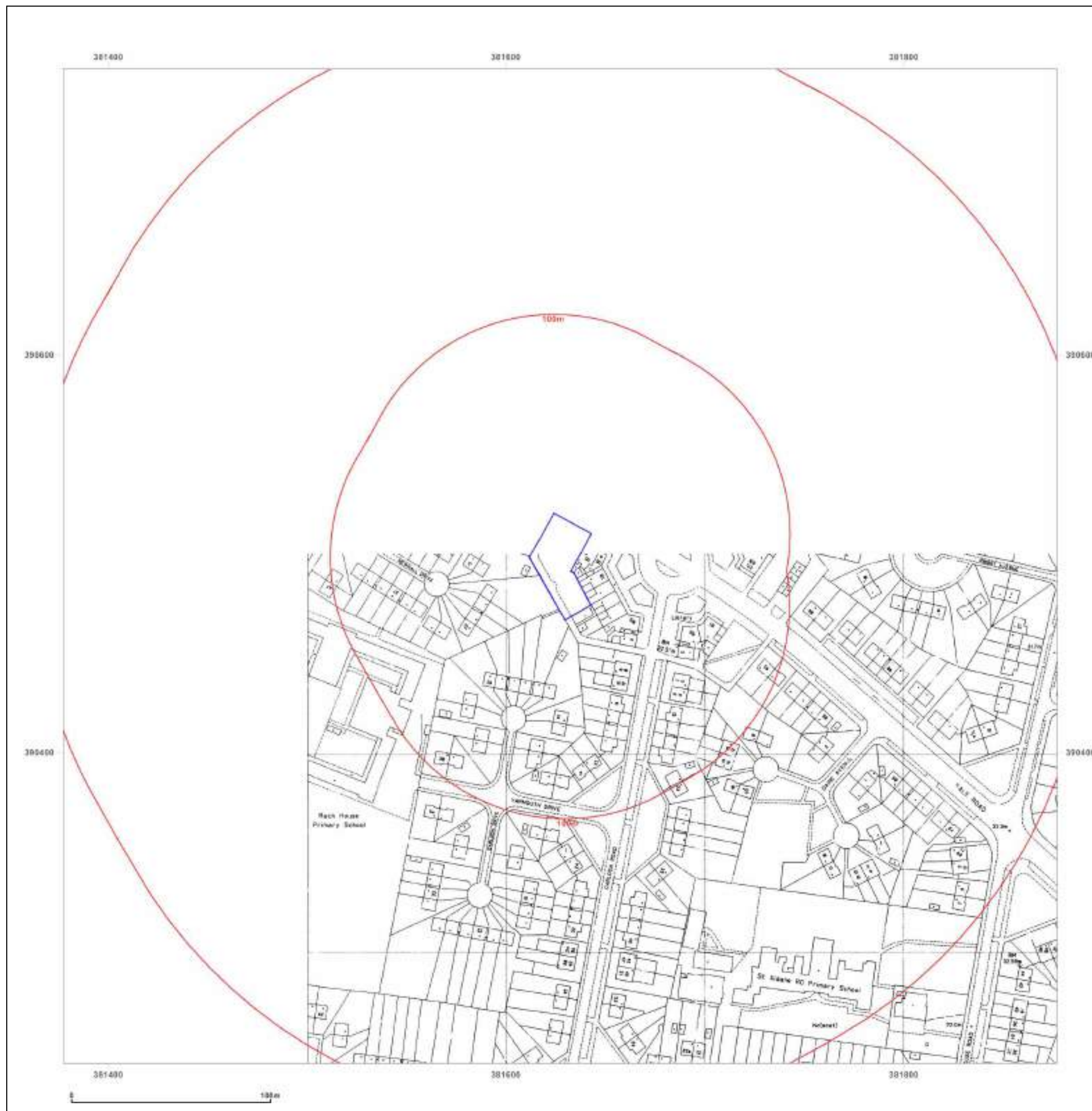


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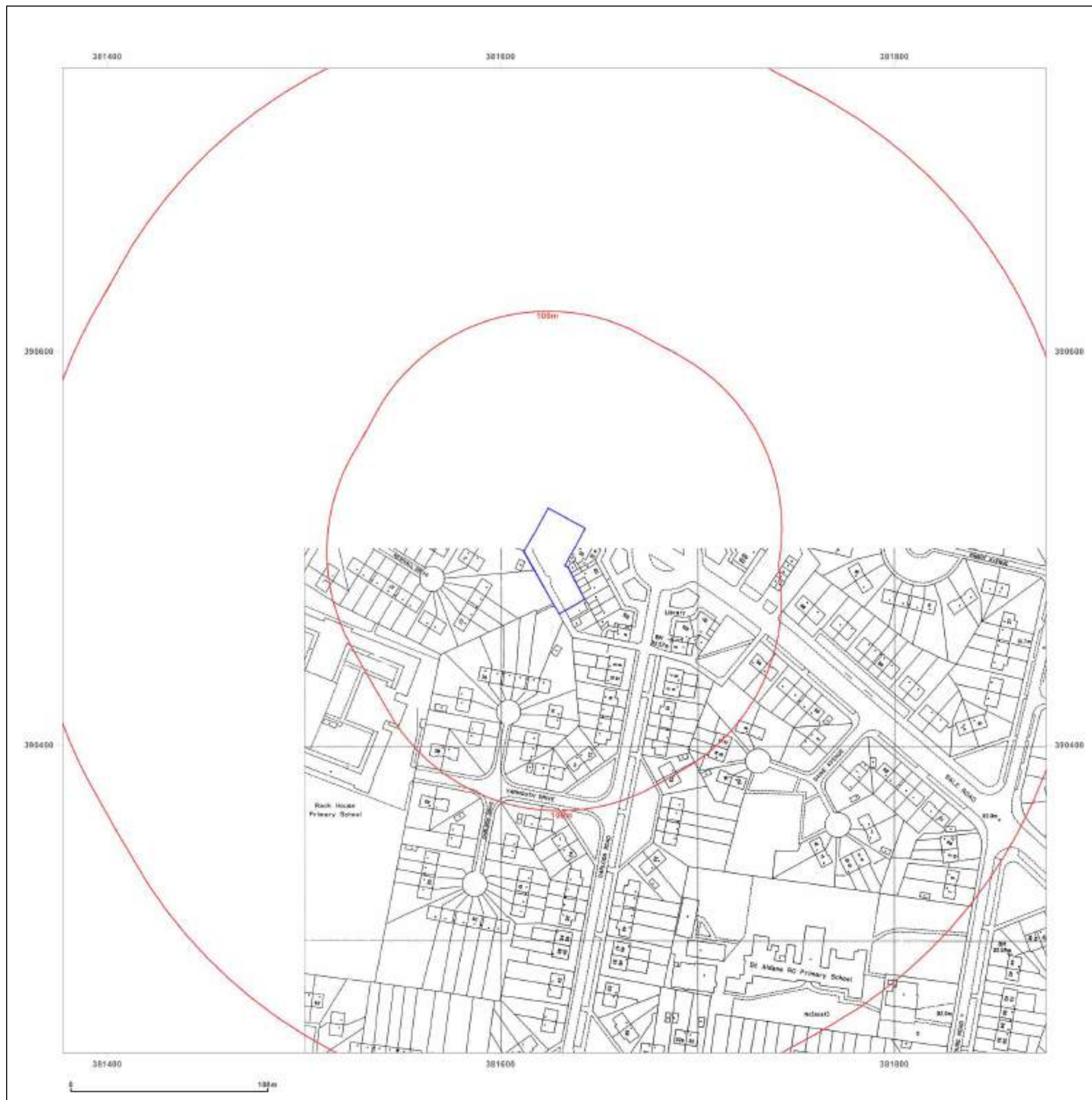


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Grid Ref: 381627, 390494

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

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Sale Road, Northern Moor, Manchester,

Order Details

Date: 07/01/2021
Your ref: EMS_660138_870954
Our Ref: EMS-660138_870954
Client: emapsite

Site Details

Location: 381627 390495
Area: 0.09 ha
Authority: [Manchester City Council](#)



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Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.12

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Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
13	1.1	<u>Historical industrial land uses</u>	0	0	5	4	-
14	1.2	<u>Historical tanks</u>	0	0	0	2	-
14	1.3	<u>Historical energy features</u>	0	2	1	7	-
15	1.4	Historical petrol stations	0	0	0	0	-
15	1.5	Historical garages	0	0	0	0	-
16	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
17	2.1	<u>Historical industrial land uses</u>	0	0	6	6	-
18	2.2	<u>Historical tanks</u>	0	0	0	2	-
18	2.3	<u>Historical energy features</u>	0	6	3	10	-
19	2.4	Historical petrol stations	0	0	0	0	-
20	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
21	3.1	Active or recent landfill	0	0	0	0	-
21	3.2	Historical landfill (BGS records)	0	0	0	0	-
22	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
22	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
22	3.5	Historical waste sites	0	0	0	0	-
22	3.6	Licensed waste sites	0	0	0	0	-
22	3.7	<u>Waste exemptions</u>	0	0	1	0	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
24	4.1	<u>Recent industrial land uses</u>	0	2	2	-	-
25	4.2	Current or recent petrol stations	0	0	0	0	-
25	4.3	Electricity cables	0	0	0	0	-
25	4.4	Gas pipelines	0	0	0	0	-
25	4.5	Sites determined as Contaminated Land	0	0	0	0	-



26	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
26	4.7	Regulated explosive sites	0	0	0	0	-
26	4.8	Hazardous substance storage/usage	0	0	0	0	-
26	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
26	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
27	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
27	4.12	Radioactive Substance Authorisations	0	0	0	0	-
27	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
27	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
27	4.15	Pollutant release to public sewer	0	0	0	0	-
28	4.16	List 1 Dangerous Substances	0	0	0	0	-
28	4.17	List 2 Dangerous Substances	0	0	0	0	-
28	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
28	4.19	Pollution inventory substances	0	0	0	0	-
28	4.20	Pollution inventory waste transfers	0	0	0	0	-
29	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
30	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
32	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
34	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
35	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
35	5.5	Groundwater vulnerability- local information	None (within 0m)				
36	5.6	<u>Groundwater abstractions</u>	0	0	0	0	6
38	5.7	<u>Surface water abstractions</u>	0	0	0	0	2
39	5.8	Potable abstractions	0	0	0	0	0
39	5.9	Source Protection Zones	0	0	0	0	-
39	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
40	6.1	Water Network (OS MasterMap)	0	0	0	-	-



40	6.2	Surface water features	0	0	0	-	-
41	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
41	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
42	6.5	<u>WFD Groundwater bodies</u>	2	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
43	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
43	7.2	Historical Flood Events	0	0	0	-	-
43	7.3	Flood Defences	0	0	0	-	-
43	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
44	7.5	Flood Storage Areas	0	0	0	-	-
45	7.6	Flood Zone 2	None (within 50m)				
45	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
46	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
48	9.1	<u>Groundwater flooding</u>	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
49	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
50	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
50	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
50	10.4	Special Protection Areas (SPA)	0	0	0	0	0
50	10.5	National Nature Reserves (NNR)	0	0	0	0	0
51	10.6	<u>Local Nature Reserves (LNR)</u>	0	0	0	1	1
51	10.7	Designated Ancient Woodland	0	0	0	0	0
51	10.8	Biosphere Reserves	0	0	0	0	0
51	10.9	Forest Parks	0	0	0	0	0
52	10.10	Marine Conservation Zones	0	0	0	0	0
52	10.11	<u>Green Belt</u>	0	0	0	2	0
52	10.12	Proposed Ramsar sites	0	0	0	0	0



52	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
53	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
53	10.15	Nitrate Sensitive Areas	0	0	0	0	0
53	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
54	<u>10.17</u>	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
55	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
56	11.1	World Heritage Sites	0	0	0	-	-
56	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
56	11.3	National Parks	0	0	0	-	-
56	11.4	Listed Buildings	0	0	0	-	-
57	11.5	Conservation Areas	0	0	0	-	-
57	11.6	Scheduled Ancient Monuments	0	0	0	-	-
57	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
58	<u>12.1</u>	<u>Agricultural Land Classification</u>	Urban (within 250m)				
59	12.2	Open Access Land	0	0	0	-	-
59	12.3	Tree Felling Licences	0	0	0	-	-
59	12.4	Environmental Stewardship Schemes	0	0	0	-	-
59	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
60	13.1	Priority Habitat Inventory	0	0	0	-	-
60	13.2	Habitat Networks	0	0	0	-	-
60	13.3	Open Mosaic Habitat	0	0	0	-	-
60	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
61	<u>14.1</u>	<u>10k Availability</u>	Identified (within 500m)				
62	<u>14.2</u>	<u>Artificial and made ground (10k)</u>	0	0	0	1	-
63	<u>14.3</u>	<u>Superficial geology (10k)</u>	1	0	0	3	-

64	14.4	Landslip (10k)	0	0	0	0	-
65	14.5	<u>Bedrock geology (10k)</u>	1	0	0	1	-
66	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
67	15.1	<u>50k Availability</u>	Identified (within 500m)				
68	15.2	Artificial and made ground (50k)	0	0	0	0	-
68	15.3	Artificial ground permeability (50k)	0	0	-	-	-
69	15.4	<u>Superficial geology (50k)</u>	1	0	0	2	-
70	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
70	15.6	Landslip (50k)	0	0	0	0	-
70	15.7	Landslip permeability (50k)	None (within 50m)				
71	15.8	<u>Bedrock geology (50k)</u>	1	0	0	0	-
72	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
72	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
73	16.1	<u>BGS Boreholes</u>	0	0	13	-	-
Page	Section	Natural ground subsidence					
75	17.1	<u>Shrink swell clays</u>	Negligible (within 50m)				
76	17.2	<u>Running sands</u>	Very low (within 50m)				
77	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
78	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
79	17.5	<u>Landslides</u>	Very low (within 50m)				
80	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
81	18.1	Natural cavities	0	0	0	0	-
81	18.2	BritPits	0	0	0	0	-
81	18.3	Surface ground workings	0	0	0	-	-
81	18.4	Underground workings	0	0	0	0	0
82	18.5	Historical Mineral Planning Areas	0	0	0	0	-



82	18.6	Non-coal mining	0	0	0	0	0
82	18.7	Mining cavities	0	0	0	0	0
82	18.8	<u>JPB mining areas</u>	Identified (within 0m)				
83	18.9	Coal mining	None (within 0m)				
83	18.10	Brine areas	None (within 0m)				
83	18.11	Gypsum areas	None (within 0m)				
83	18.12	Tin mining	None (within 0m)				
83	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
84	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
85	20.1	<u>BGS Estimated Background Soil Chemistry</u>	2	0	-	-	-
85	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
85	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
86	21.1	Underground railways (London)	0	0	0	-	-
86	21.2	Underground railways (Non-London)	0	0	0	-	-
86	21.3	Railway tunnels	0	0	0	-	-
86	21.4	Historical railway and tunnel features	0	0	0	-	-
86	21.5	Royal Mail tunnels	0	0	0	-	-
87	21.6	Historical railways	0	0	0	-	-
87	21.7	Railways	0	0	0	-	-
87	21.8	Crossrail 1	0	0	0	0	-
87	21.9	Crossrail 2	0	0	0	0	-
87	21.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 22/04/2019

Site Area: 0.09ha



Recent site history - 2015 aerial photograph



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Capture Date: 11/06/2015

Site Area: 0.09ha



Recent site history - 2009 aerial photograph



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Capture Date: 02/06/2009

Site Area: 0.09ha



Recent site history - 2000 aerial photograph



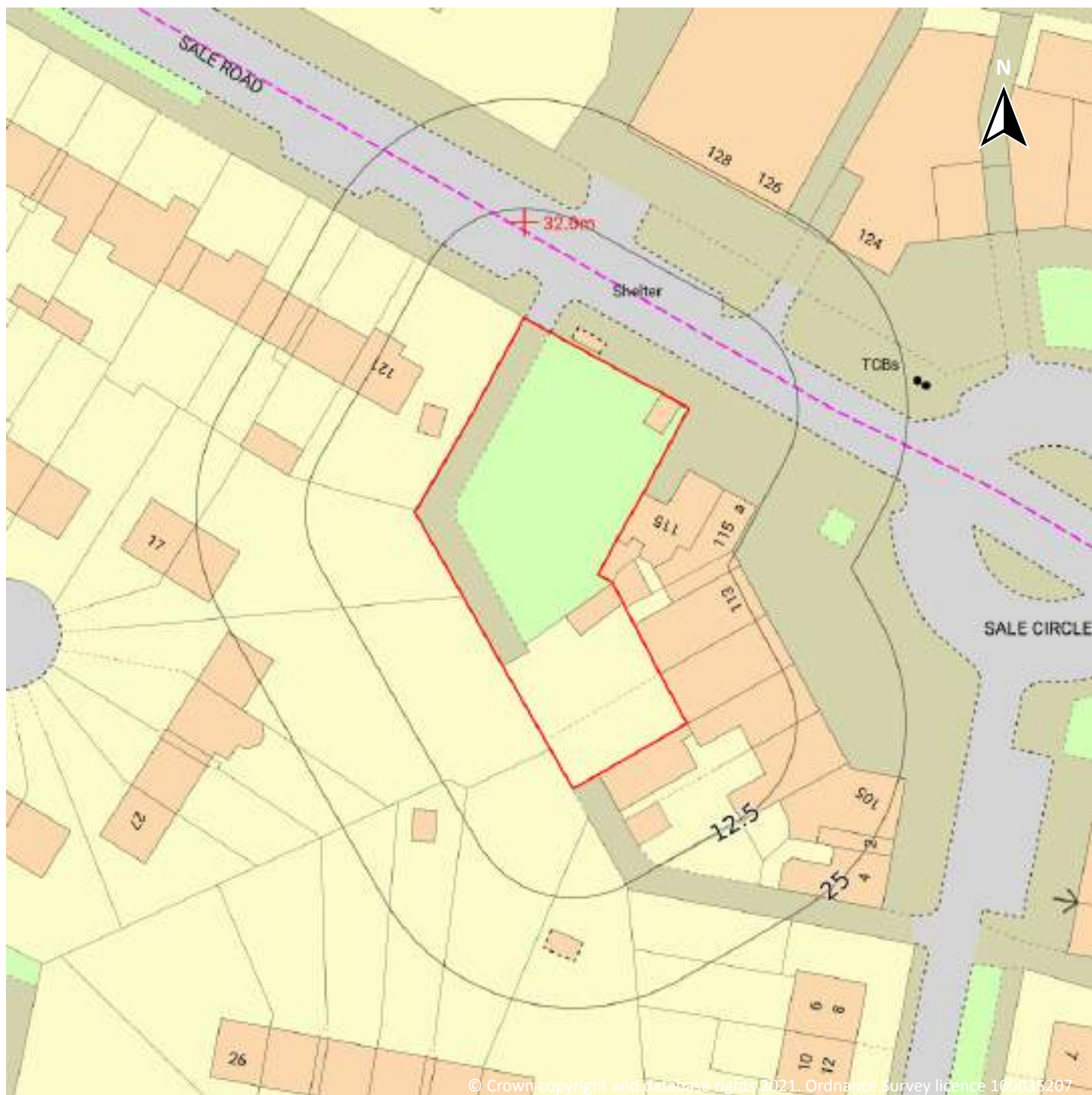
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Capture Date: 27/06/2000

Site Area: 0.09ha



OS MasterMap site plan



Site Area: 0.09ha



1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features

1.1 Historical industrial land uses

Records within 500m

9

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

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
B	50m NW	Nursery	1966	831889



ID	Location	Land use	Dates present	Group ID
C	98m N	Nursery	1955	831890
C	103m NE	Nurseries	1938	843944
1	170m NW	Nursery	1938 - 1955	930112
2	180m N	Nursery	1938	895368
3	258m NE	Unspecified Ground Workings	1978	800675
4	291m NW	Nursery	1938 - 1955	920352
F	490m N	Unspecified Ground Workings	1966 - 1978	915326
F	492m N	Unspecified Ground Workings	1988	967299

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

2

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

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
5	358m E	Unspecified Tank	1922	114992
6	415m E	Unspecified Tank	1907	114993

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

10

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

Features are displayed on the Past land use map on **page 13**



ID	Location	Land use	Dates present	Group ID
A	47m N	Electricity Substation	1956 - 1992	68976
A	48m N	Electricity Substation	1982	69997
B	88m N	Gas Governor	1987 - 1992	77829
D	294m N	Electricity Substation	1982	73578
D	295m N	Electricity Substation	1987 - 1992	76131
E	415m SW	Electricity Substation	1956	69244
E	432m SW	Electricity Substation	1955	65242
E	434m SW	Electricity Substation	1990	80742
G	497m NW	Electricity Substation	1992	78733
G	498m NW	Electricity Transformer	1976	63789

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.



1.6 Historical military land

Records within 500m

0

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

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



2 Past land use - un-grouped



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features

2.1 Historical industrial land uses

Records within 500m

12

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

Features are displayed on the Past land use - un-grouped map on **page 17**

ID	Location	Land Use	Date	Group ID
B	50m NW	Nursery	1966	831889
C	98m N	Nursery	1955	831890
C	103m NE	Nurseries	1938	843944

ID	Location	Land Use	Date	Group ID
D	170m NW	Nursery	1955	930112
1	180m N	Nursery	1938	895368
D	196m NW	Nursery	1938	930112
2	258m NE	Unspecified Ground Workings	1978	800675
E	291m NW	Nursery	1955	920352
E	293m NW	Nursery	1938	920352
H	490m N	Unspecified Ground Workings	1978	915326
H	492m N	Unspecified Ground Workings	1966	915326
H	492m N	Unspecified Ground Workings	1988	967299

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

2

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

Features are displayed on the Past land use - un-grouped map on **page 17**

ID	Location	Land Use	Date	Group ID
3	358m E	Unspecified Tank	1922	114992
4	415m E	Unspecified Tank	1907	114993

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

19

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

Features are displayed on the Past land use - un-grouped map on **page 17**



ID	Location	Land Use	Date	Group ID
A	47m N	Electricity Substation	1992	68976
A	47m N	Electricity Substation	1992	68976
A	47m N	Electricity Substation	1956	68976
A	48m N	Electricity Substation	1987	68976
A	48m N	Electricity Substation	1956	68976
A	48m N	Electricity Substation	1982	69997
B	88m N	Gas Governor	1987	77829
B	88m N	Gas Governor	1992	77829
B	88m N	Gas Governor	1992	77829
F	294m N	Electricity Substation	1982	73578
F	295m N	Electricity Substation	1992	76131
F	295m N	Electricity Substation	1992	76131
F	295m N	Electricity Substation	1987	76131
G	415m SW	Electricity Substation	1956	69244
G	432m SW	Electricity Substation	1955	65242
G	434m SW	Electricity Substation	1990	80742
I	497m NW	Electricity Substation	1992	78733
I	497m NW	Electricity Substation	1992	78733
I	498m NW	Electricity Transformer	1976	63789

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.



2.5 Historical garages

Records within 500m

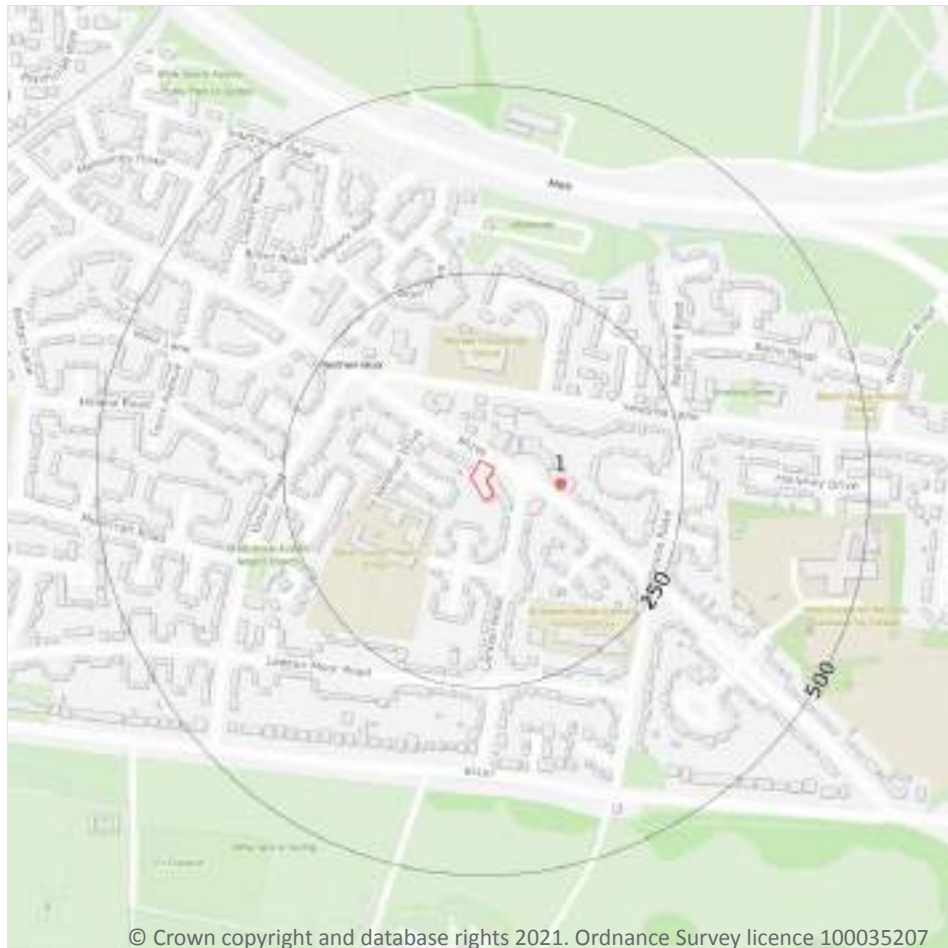
0

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

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

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

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

3.2 Historical landfill (BGS records)

Records within 500m

0

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

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m

0

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m

0

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

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

3.5 Historical waste sites

Records within 500m

0

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

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

3.6 Licensed waste sites

Records within 500m

0

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

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

3.7 Waste exemptions

Records within 500m

1

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

Features are displayed on the Waste and landfill map on **page 21**

ID	Location	Site	Reference	Category	Sub-Category	Description
1	90m E	100b Sale Road MANCHESTER M23 0BX	EPR/UF0637Y G/A001	Treating waste exemption	Non- Agricultural Waste Only	Sorting and de-naturing of controlled drugs for disposal

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



4 Current industrial land use



— Site Outline
Search buffers in metres (m)
● Recent industrial land uses

4.1 Recent industrial land uses

Records within 250m

4

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 24**

ID	Location	Company	Address	Activity	Category
1	6m NE	Ford Pots	113, Sale Road, Manchester, Greater Manchester, M23 0BU	Vehicle Parts and Accessories	Motoring
2	45m N	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities

ID	Location	Company	Address	Activity	Category
3	91m N	Gas Governor Station	Greater Manchester, M23	Gas Features	Infrastructure and Facilities
4	242m W	Ems-it	8, Orton Avenue, Manchester, Greater Manchester, M23 0LF	Electrical Equipment Repair and Servicing	Repair and Servicing

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

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

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

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

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

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

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

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

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

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m**0**

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

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m**0**

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

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m**0**

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

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m**0**

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

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

4.10 Licensed industrial activities (Part A(1))

Records within 500m**0**

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

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

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

Records within 500m**0**

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

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m**0**

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

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

4.13 Licensed Discharges to controlled waters

Records within 500m**0**

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

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

4.14 Pollutant release to surface waters (Red List)

Records within 500m**0**

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

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

4.15 Pollutant release to public sewer

Records within 500m**0**

Discharges of Special Category Effluents to the public sewer.

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

4.16 List 1 Dangerous Substances

Records within 500m**0**

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

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

4.17 List 2 Dangerous Substances

Records within 500m**0**

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m**0**

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

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

4.19 Pollution inventory substances

Records within 500m**0**

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

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

4.20 Pollution inventory waste transfers

Records within 500m**0**

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

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

4.21 Pollution inventory radioactive waste

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

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

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



5 Hydrogeology - Superficial aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

2

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 30**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	467m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

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



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

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5.2 Bedrock aquifer

Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 32**

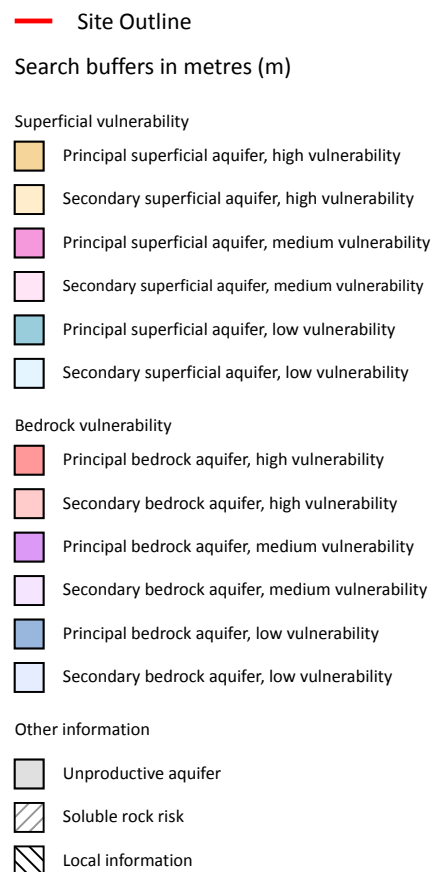
ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	467m S	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers



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



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

1

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

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

Features are displayed on the Groundwater vulnerability map on **page 34**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures

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

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

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

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

5.5 Groundwater vulnerability- local information

Records on site

0

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

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

Abstractions and Source Protection Zones



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

6

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 36**

ID	Location	Details	
-	1561m NW	Status: Historical Licence No: 2569015003 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: WELL AT NURSERY, RUTLAND LANE, SALE, CHESHIRE Data Type: Point Name: RILEY Easting: 380600 Northing: 391700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 25/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 25/01/1966 Version End Date: -
-	1691m N	Status: Active Licence No: 2569015015 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT CHORLTON-CUM-HARDY GOLF CLUB Data Type: Point Name: CHORLTON CUM HARDY GOLF CO LTD Easting: 382230 Northing: 392100	Annual Volume (m ³): 8,500 Max Daily Volume (m ³): 70 Original Application No: - Original Start Date: 04/09/1998 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2019 Version End Date: -
-	1717m NW	Status: Historical Licence No: 2569015002 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "WELL AT PREMISES, 5 RUTLAND LANE, SALE, CHESH" Data Type: Point Name: ASTBURY Easting: 380600 Northing: 391900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/01/1966 Version End Date: -
-	1717m NW	Status: Historical Licence No: 2569015002 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: WELL AT PREMISES, 5 RUTLAND LANE, SALE, CHESH Data Type: Point Name: ASTBURY Easting: 380600 Northing: 391900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/01/1966 Version End Date: -

ID	Location	Details	
-	1778m NW	Status: Historical Licence No: 2569015013 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: "A BOREHOLE AT SALE GOLF CLUB, CHESHIRE" Data Type: Point Name: THE SECRETARY OF SALE GOLF CLUB Easting: 380750 Northing: 392070	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 24/10/1996 Expiry Date: - Issue No: 101 Version Start Date: 08/12/1999 Version End Date: -
-	1778m NW	Status: Active Licence No: 2569015013 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: A BOREHOLE AT SALE GOLF CLUB, CHESHIRE Data Type: Point Name: JOHN HILTON Easting: 380750 Northing: 392070	Annual Volume (m ³): 10,000 Max Daily Volume (m ³): 100 Original Application No: - Original Start Date: 24/10/1996 Expiry Date: - Issue No: 102 Version Start Date: 15/02/2005 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m

2

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 36**

ID	Location	Details	
-	1128m NE	Status: Historical Licence No: 2569015016 Details: Dust suppression Direct Source: Surface, Non-Tidal - North West Region Point: RIVER MERSEY AT TRAFFORD, MANCHESTER Data Type: Point Name: AMEC / ALFRED MCALPINE JV Easting: 382650 Northing: 391020	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/11/2003 Expiry Date: 31/12/2006 Issue No: 1 Version Start Date: 28/11/2003 Version End Date: -



ID	Location	Details	
-	1128m NE	Status: Historical Licence No: 2569015016 Details: General Washing/Process Washing Direct Source: Surface, Non-Tidal - North West Region Point: RIVER MERSEY AT TRAFFORD, MANCHESTER Data Type: Point Name: AMEC / ALFRED MCALPINE JV Easting: 382650 Northing: 391020	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/11/2003 Expiry Date: 31/12/2006 Issue No: 1 Version Start Date: 28/11/2003 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m	0
-----------------------------	----------

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

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

5.9 Source Protection Zones

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

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

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

5.10 Source Protection Zones (confined aquifer)

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

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

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

6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

0

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

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

0

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

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1
------------------------	----------

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

Features are displayed on the Hydrology map on **page 40**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River WB catchment	Sinderland Brook (Fairwell Bk and Baguley Bk)	GB112069061270	Bollin, Dean, Upper Mersey	Upper Mersey

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

6.4 WFD Surface water bodies

Records identified	1
---------------------------	----------

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

Features are displayed on the Hydrology map on **page 40**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	970m SW	River	Sinderland Brook (Fairwell Bk and Baguley Bk)	GB112069061270	Moderate	Good	Moderate	2016

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



6.5 WFD Groundwater bodies

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

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

Features are displayed on the Hydrology map on **page 40**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Weaver and Dane Quaternary Sand and Gravel Aquifers	<u>GB41202G991700</u>	Poor	Poor	Good	2015
A	On site	Weaver and Dane Quaternary Sand and Gravel Aquifers	<u>GB41202G991700</u>	Poor	Poor	Good	2016

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

7 River and coastal flooding

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m**0**

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

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

7.2 Historical Flood Events

Records within 250m**0**

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

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

7.3 Flood Defences

Records within 250m**0**

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

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

7.4 Areas Benefiting from Flood Defences

Records within 250m**0**

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

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

7.5 Flood Storage Areas

Records within 250m

0

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

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



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0
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Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

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

7.7 Flood Zone 3

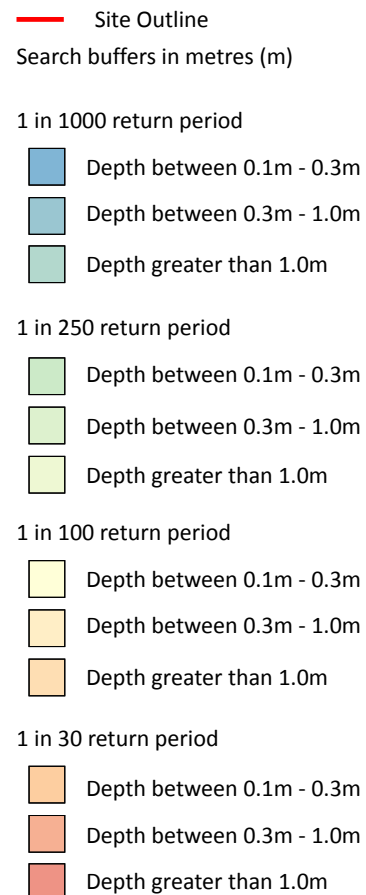
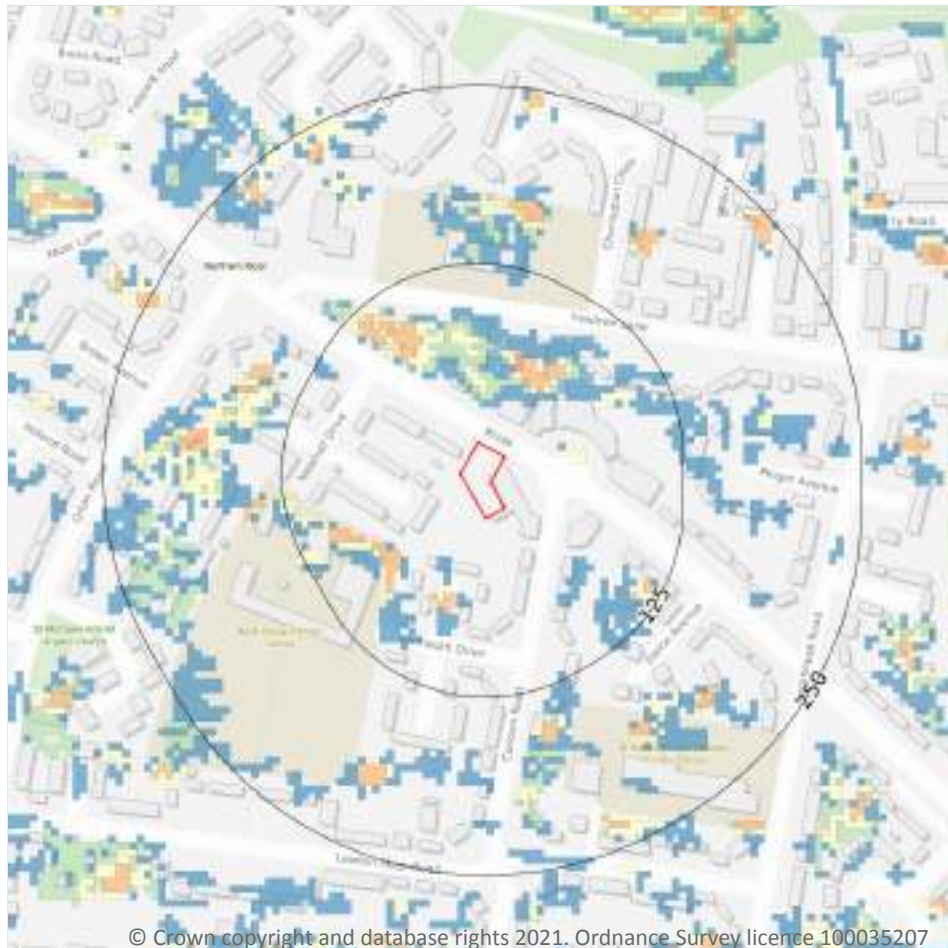
Records within 50m	0
--------------------	---

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

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



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

Negligible

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

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

Features are displayed on the Surface water flooding map on **page 46**

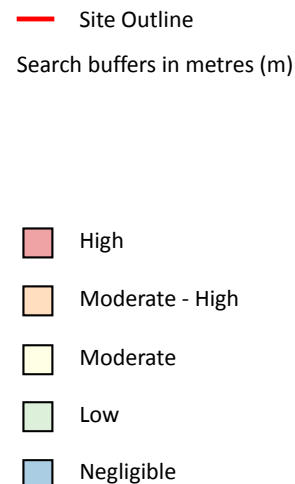
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

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

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiantal Risk Analytics.

9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Moderate

Highest risk within 50m

Moderate

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

Features are displayed on the Groundwater flooding map on **page 48**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- + Local Nature Reserves (LNR)
- / Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m**2**

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

Features are displayed on the Environmental designations map on **page 49**

ID	Location	Name	Data source
2	367m S	Wythenshawe Park	Natural England
4	1233m N	Chorlton Water Park	Natural England

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

10.7 Designated Ancient Woodland

Records within 2000m**0**

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

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

10.8 Biosphere Reserves

Records within 2000m**0**

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

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

10.9 Forest Parks

Records within 2000m**0**

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

This data is sourced from the Forestry Commission.



10.10 Marine Conservation Zones

Records within 2000m**0**

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

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

10.11 Green Belt

Records within 2000m**2**

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

Features are displayed on the Environmental designations map on **page 49**

ID	Location	Name	Local Authority name
1	251m N	Liverpool and Manchester	Manchester
3	464m N	Liverpool and Manchester	Trafford

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

10.12 Proposed Ramsar sites

Records within 2000m**0**

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

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m**0**

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

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

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

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

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

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

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

0

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

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

SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

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

Features are displayed on the SSSI Impact Zones and Units map on **page 54**

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Oil & gas exploration/extraction. Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 4000m². Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	0
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

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



11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

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

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

11.3 National Parks

Records within 250m

0

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

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

11.4 Listed Buildings

Records within 250m

0

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



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

11.5 Conservation Areas

Records within 250m

0

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

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

11.6 Scheduled Ancient Monuments

Records within 250m

0

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

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

11.7 Registered Parks and Gardens

Records within 250m

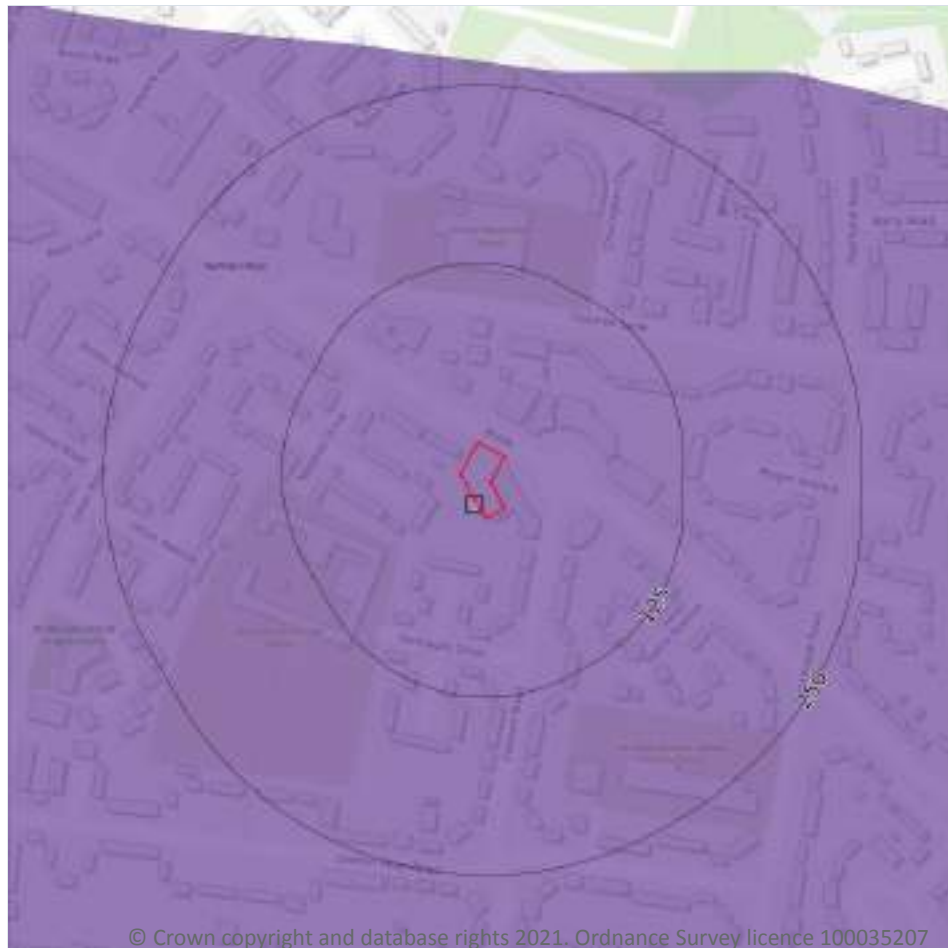
0

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

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



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

1

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

Features are displayed on the Agricultural designations map on **page 58**

ID	Location	Classification	Description
1	On site	Urban	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m**0**

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

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

12.3 Tree Felling Licences

Records within 250m**0**

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

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m**0**

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m**0**

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

This data is sourced from Natural England.

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m**0**

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

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m**0**

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

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m**0**

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

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m**0**

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



- Site Outline
- Search buffers in metres (m)
- Full coverage
 - Partial coverage
 - No coverage

14.1 10k Availability

Records within 500m

2

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

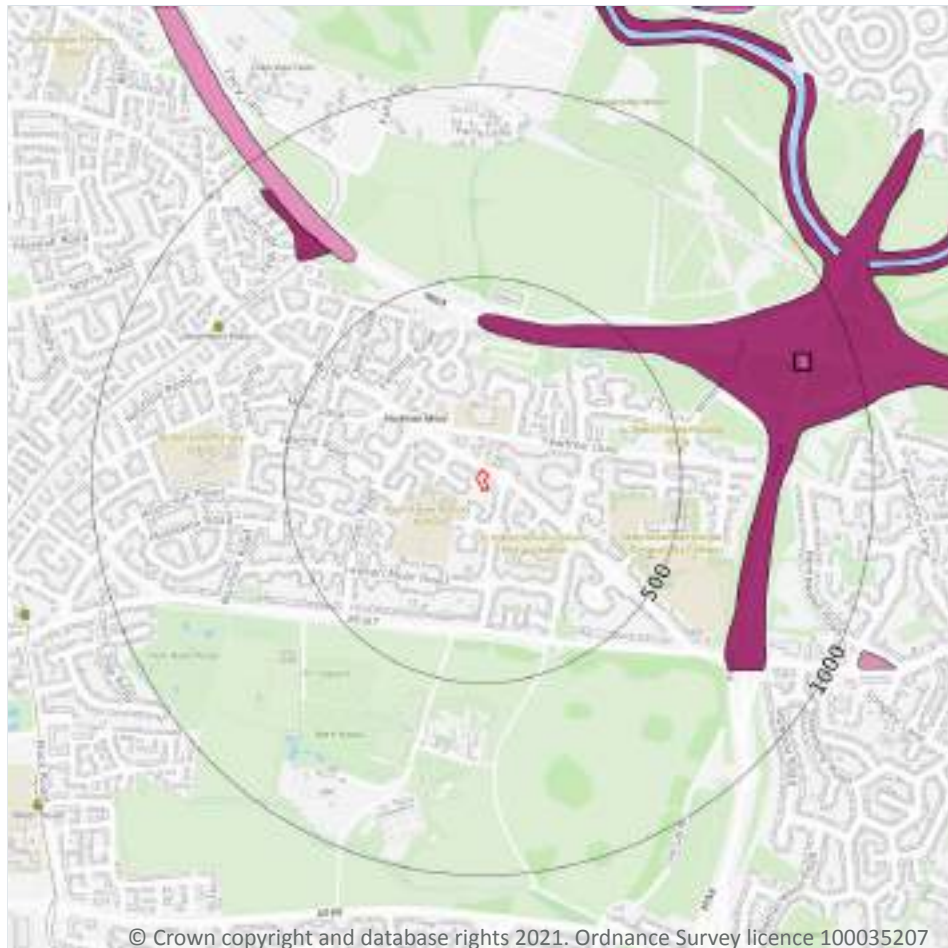
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 61**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	SJ89SW
2	467m S	No coverage	Full	Full	No coverage	SJ88NW

This data is sourced from the British Geological Survey.



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



— Site Outline
Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m

1

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

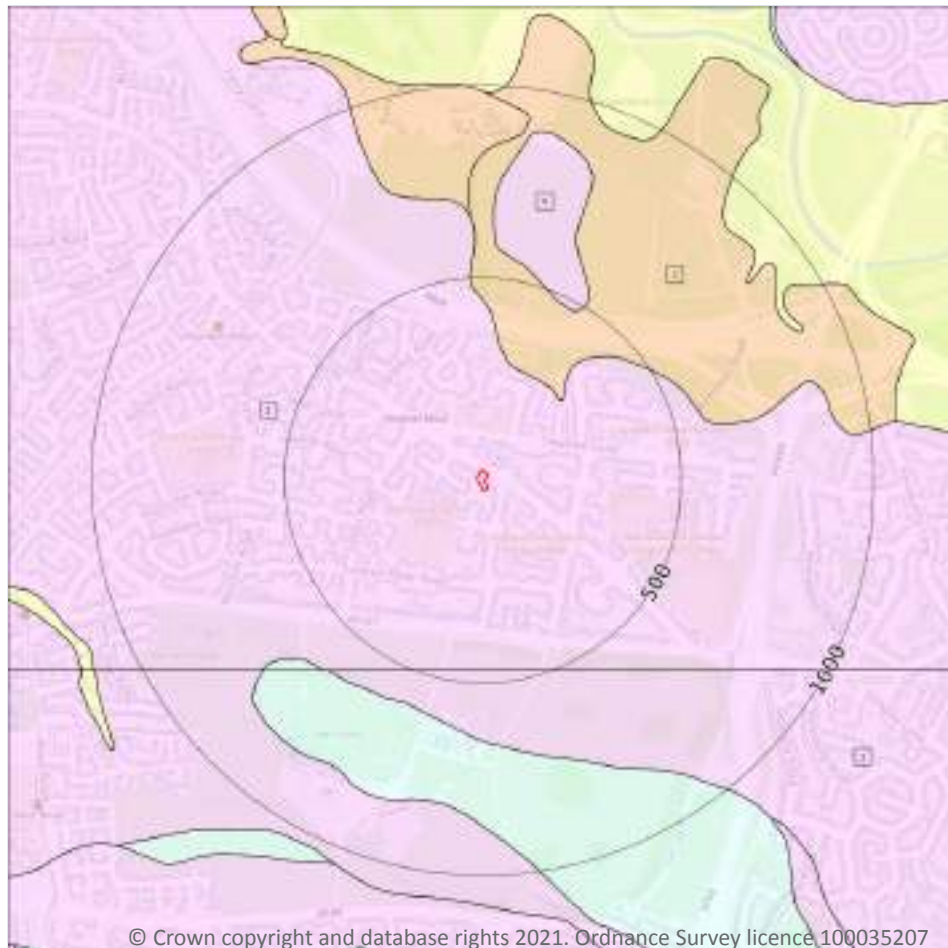
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 62**

ID	Location	LEX Code	Description	Rock description
1	353m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

4

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

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 63**

ID	Location	LEX Code	Description	Rock description
1	On site	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel
2	267m NE	RTD1-XSV	River Terrace Deposits, 1 - Sand And Gravel	Sand And Gravel
3	467m S	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel
4	476m NE	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

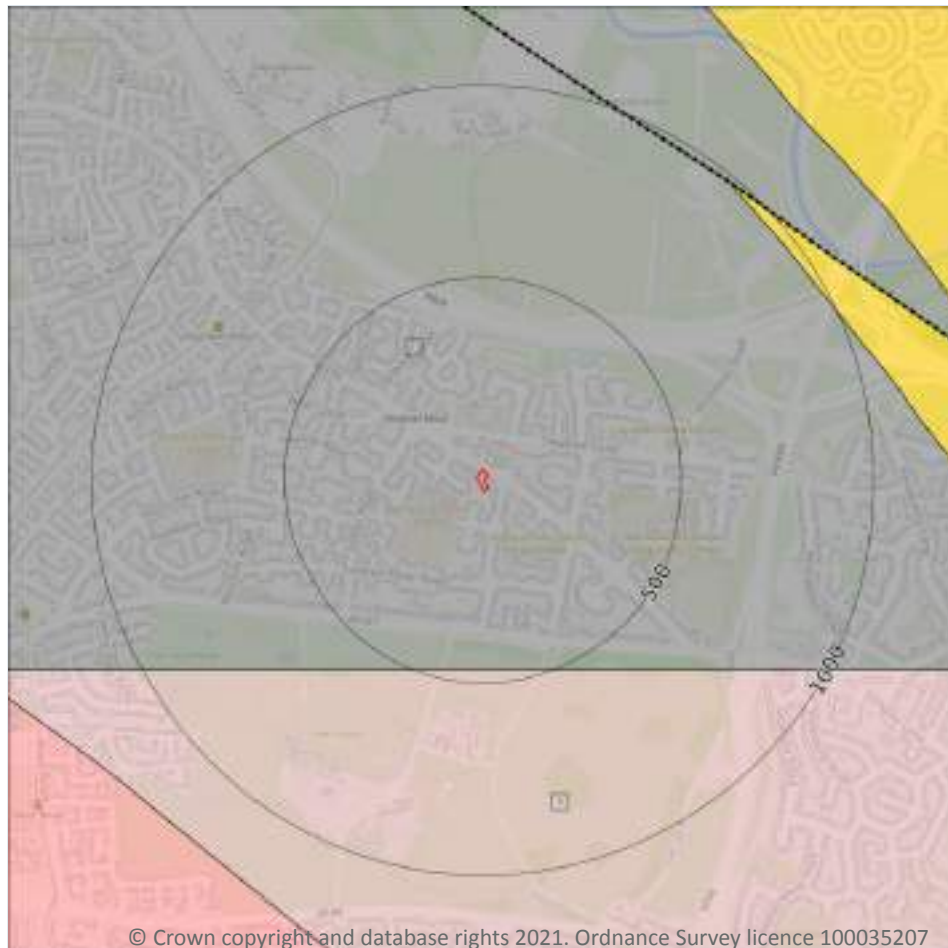
0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

2

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

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 65**

ID	Location	LEX Code	Description	Rock age
1	On site	TPSF-SLST	Tarporley Siltstone Formation - Siltstone	Anisian Age - Olenekian Age
2	467m S	TPSF-SISD	Tarporley Siltstone Formation - Siltstone And Sandstone	Anisian Age - Olenekian Age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



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

15.1 50k Availability

Records within 500m

1

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

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 67**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW098_stockport_v4

This data is sourced from the British Geological Survey.



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

15.2 Artificial and made ground (50k)

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

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

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

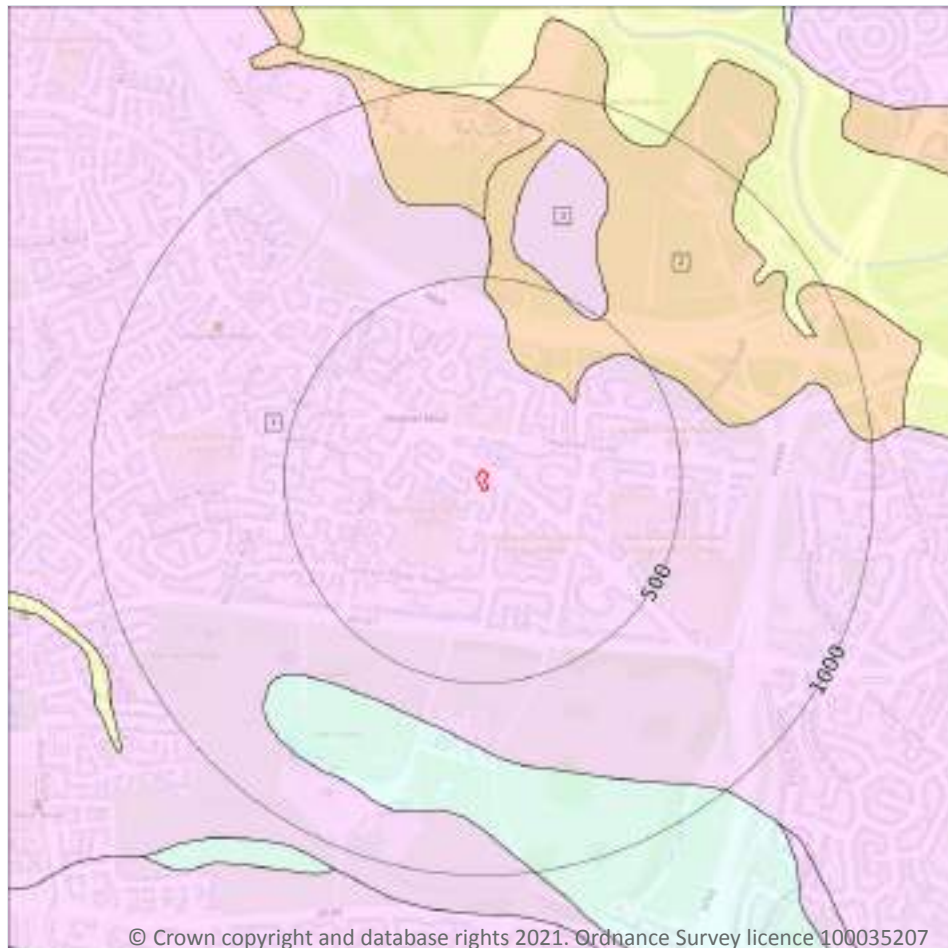
Records within 50m	0
--------------------	---

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

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

3

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 69**

ID	Location	LEX Code	Description	Rock description
1	On site	GFSDDD-XSV	GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN	SAND AND GRAVEL
2	285m NE	RTDU-XSV	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND AND GRAVEL
3	481m NE	GFSDDD-XSV	GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN	SAND AND GRAVEL

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m**1**

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

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

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m**0**

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

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

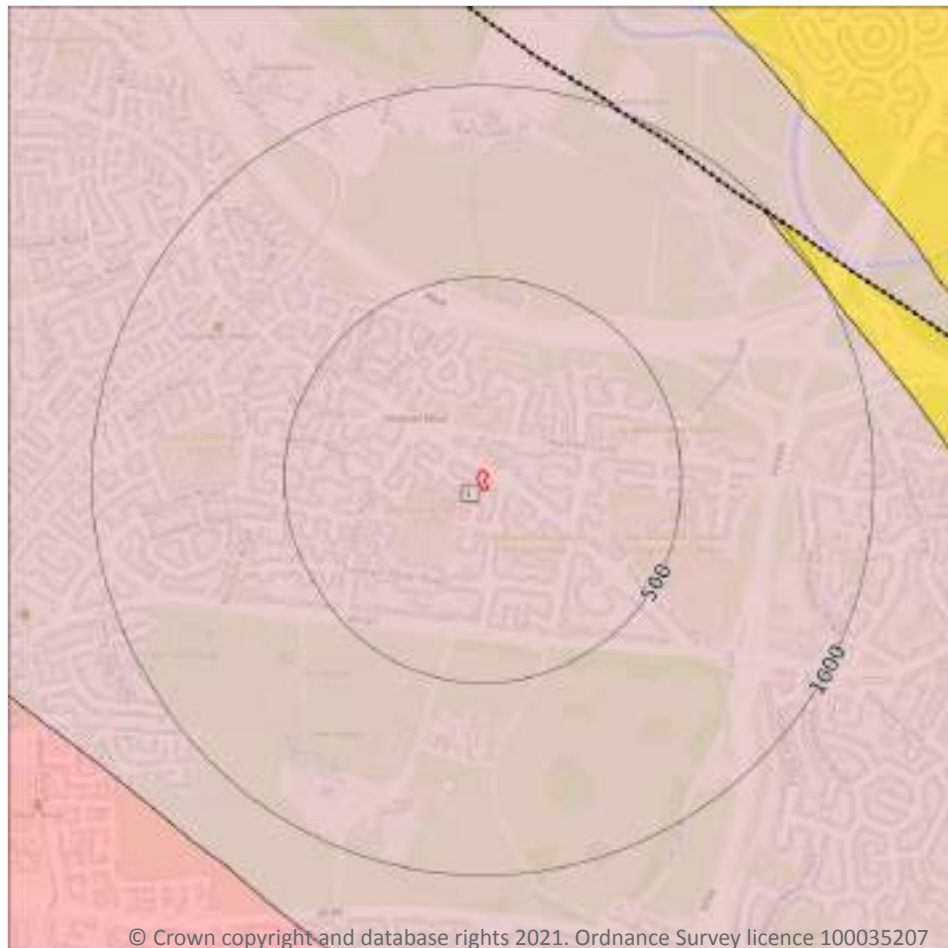
Records within 50m**0**

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

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



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

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15.8 Bedrock geology (50k)

Records within 500m

1

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 71**

ID	Location	LEX Code	Description	Rock age
1	On site	TPSF-SIMS	TARPORLEY SILTSTONE FORMATION - SILTSTONE, MUDSTONE AND SANDSTONE	OLENEKIAN

This data is sourced from the British Geological Survey.



15.9 Bedrock permeability (50k)

Records within 50m**1**

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

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m**0**

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

This data is sourced from the British Geological Survey.



16 Boreholes



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— Site Outline
Search buffers in metres (m)

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

16.1 BGS Boreholes

Records within 250m

13

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

Features are displayed on the Boreholes map on **page 73**

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	124m N	381590 390640	HYDROTHERAPY POOL PIPER HILL SCHOOL 1	-	Y	N/A
A	137m N	381580 390650	HYDROTHERAPY POOL PIPER HILL SCHOOL 2	-	Y	N/A



ID	Location	Grid reference	Name	Length	Confidential	Web link
B	197m N	381570 390710	31 TIPTON DRIVE, NORTHERN MOOR, MANCHESTER 1	2.8	N	15018345
B	197m N	381570 390710	31 TIPTON DRIVE, NORTHERN MOOR, MANCHESTER TP 1	0.8	N	15018346
C	208m NW	381490 390680	SALE ROAD NORTH MOOR TP 5	-	Y	N/A
C	216m NW	381490 390690	SALE ROAD NORTH MOOR TP 4	-	Y	N/A
C	229m NW	381470 390690	SALE ROAD NORTH MOOR TP 6	-	Y	N/A
C	230m NW	381480 390700	SALE ROAD NORTH MOOR TP 3	-	Y	N/A
C	236m NW	381450 390680	SALE ROAD NORTH MOOR TP 9	-	Y	N/A
C	243m NW	381460 390700	SALE ROAD NORTH MOOR TP 7	-	Y	N/A
C	244m NW	381470 390710	SALE ROAD NORTH MOOR TP 2	-	Y	N/A
C	245m NW	381430 390670	SALE ROAD NORTH MOOR TP 10	-	Y	N/A
C	250m NW	381440 390690	SALE ROAD NORTH MOOR TP 8	-	Y	N/A

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.1 Shrink swell clays

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 75**

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.2 Running sands

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 76**

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 Compressible deposits

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 77**

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.4 Collapsible deposits

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 78**

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



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- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Landslides map on **page 79**

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.6 Ground dissolution of soluble rocks

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 80**

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

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities

18.1 Natural cavities

Records within 500m

0

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

This data is sourced from Peter Brett Associates (PBA).

18.2 BritPits

Records within 500m

0

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

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

0

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

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

0

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

This data is sourced from Ordnance Survey/Groundsure.



18.5 Historical Mineral Planning Areas

Records within 500m

0

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

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

0

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

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m

0

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

This data is sourced from Peter Brett Associates (PBA).

18.8 JPB mining areas

Records on site

1

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

Location	Details
On site	Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property. Further details and a quote for services can be obtained by emailing this report to enquiries.gs@jpb.co.uk .

This data is sourced from Johnson Poole and Bloomer.



18.9 Coal mining

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

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

This data is sourced from the Coal Authority.

18.10 Brine areas

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

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

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

18.11 Gypsum areas

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

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

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

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

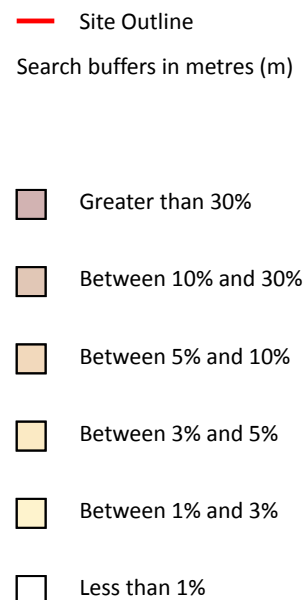
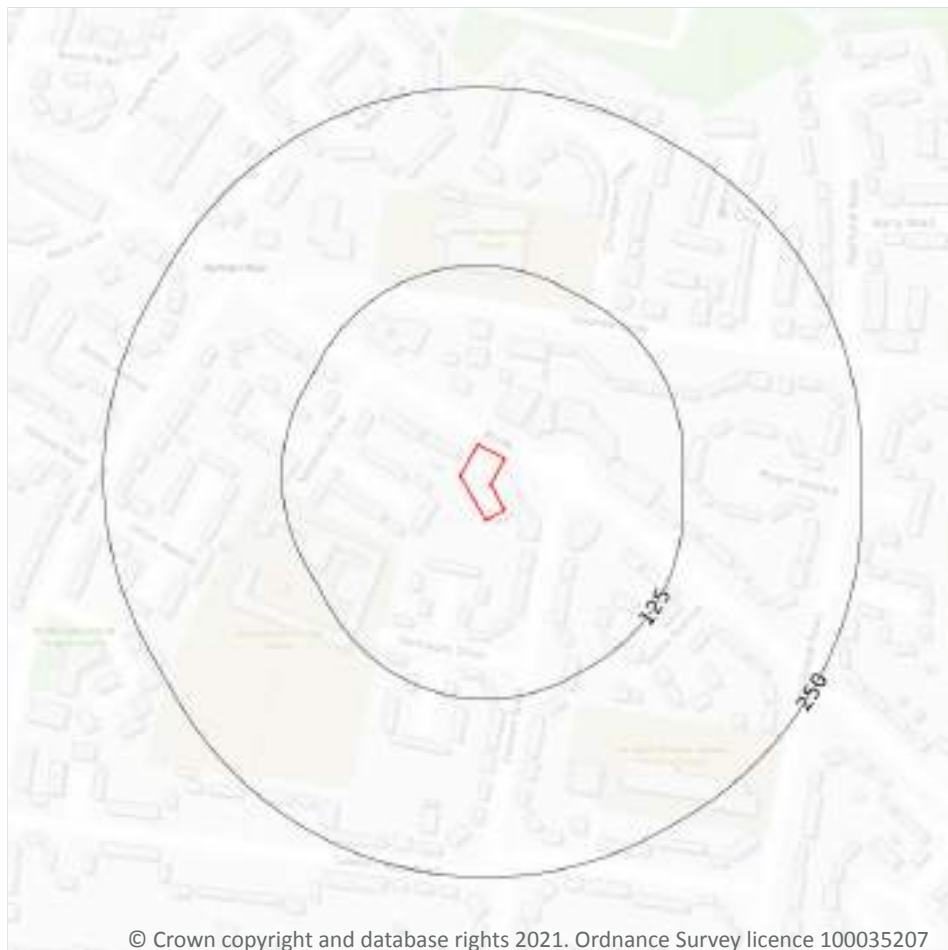
18.13 Clay mining

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

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

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

19 Radon



19.1 Radon

Records on site

1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 84**

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

This data is sourced from the British Geological Survey and Public Health England.



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

2

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

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

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

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

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

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m**0**

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

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m**0**

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

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m**0**

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m**0**

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

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m**0**

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



This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m

0

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

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m

0

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

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m

0

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

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m

0

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

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m

0

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

This data is sourced from HS2 Ltd.



Data providers

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

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: <https://www.groundsure.com/terms-and-conditions-jan-2020/>.



APPENDIX C

BOREHOLE LOG - CABLE PERCUSSION

BH1

Project Land adjacent to 115 Sale Road, Northern Moor

Project No.

AG3225-21

Client Seva Patidar Ltd

Sheet

1 of 1

Start 13/01/2021

Coordinates

Scale

1:50

End 13/01/2021

Ground Level 99.90m AOD

Total Depth

5.66m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
ES	0.30	PID = 0.0		99.50	(0.40)	Dark brown slightly clayey slightly gravelly SAND. Gravel is fine to medium subangular to subrounded brick, sandstone and mudstone. (TOPSOIL)			
PID	0.30				0.40				
B	0.40								
B	0.40	PID = 0.0		98.70	(0.80)	Orangish dark brown grey mottled clayey gravelly SAND. Gravel is fine to coarse subangular to subrounded brick, sandstone and quartzite. (MADE GROUND)			
ES	0.40								
ES	1.00								
PID	1.00	N = 8	1.00		1.20	Loose orangish brown clayey gravelly SAND. Gravel is fine to coarse subangular to subrounded sandstone and quartzite. (GLACIOFLUVIAL DEPOSITS)			
D	1.20								
C	1.20				(0.80)				
B	2.00	N = 25	1.90	97.90	2.00	Medium dense light grey sandy GRAVEL. Gravel is fine to coarse subangular to subrounded sandstone, siltstone and mudstone. Driller notes rare cobbles. (GLACIOFLUVIAL DEPOSITS)			
ES	2.00								
C	2.00				(0.60)				
ES	2.20	PID = 0.0		97.30	2.60	Firm brown slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. (GLACIAL TILL)			
PID	2.20								
S	3.00								
B	3.50	N = 13	2.80						
D	3.70								
UT	4.00				(2.60)				
		(14)				Below 3.70m bgl: stiff.			
S	5.00	N >50	3.00	94.70	5.20	At 5.00m bgl: sandstone cobble. Reddish brown SANDSTONE recovered as medium to coarse angular gravel. (TARPORLEY SILTSTONE FORMATION)			
D	5.20				(0.46)				
S	5.50				5.66				
						End of Borehole at 5.66m			

Chiselling			Groundwater Strikes					Drilled: Lundy Site Investigation Logged: HH Checked: PG
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
5.20	5.50	01:00	4.50	4.00		5.00		

Remarks: Hand dug service inspection pit excavated to 1.20m bgl.

Installation: 50mm diameter standpipe installed to 5.50m bgl.

Diameter: 150mm to 5.50m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH2

Project Land adjacent to 115 Sale Road, Northern Moor

Project No.

AG3225-21

Client Seva Patidar Ltd

Sheet

1 of 1

Start 14/01/2021

Coordinates

Scale

1:50

End 14/01/2021

Ground Level 99.90m AOD

Total Depth

5.65m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
B ES	0.10 0.10			99.85	(0.05) 0.05	Dark brown slightly clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded including brick. (TOPSOIL)			
					(1.15)	Very soft sandy gravelly CLAY. Gravel is fine to coarse angular to subangular brick, glass and ceramic. (MADE GROUND)			
D C ES B D D C	1.20 1.20 1.50 1.60 1.60 2.00 2.00	N = 4	1.00	98.70	1.20	Loose orangish brown clayey gravelly SAND. Gravel is fine to coarse subangular to subrounded including sandstone and siltstone. (GLACIOFLUVIAL DEPOSITS)			
					(1.30)	From 2.00m bgl: medium dense.			
B D	2.50 2.50	N = 10	1.90	97.40	2.50	Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and siltstone. (GLACIAL TILL) Below 3.00m bgl: stiff.			
D S	3.00 3.00	N = 19	2.80						
					(2.50)				
UT	4.00	(19)							
D S C	5.00 5.00 5.40	N >50 N >50	3.00 3.00	94.90	5.00 (0.65)	Reddish brown MUDSTONE recovered as very stiff clay. (TARPORLEY SILTSTONE FORMATION)			
				94.25	5.65	End of Borehole at 5.65m			

Chiselling			Groundwater Strikes					Drilled: Lundy Site Investigation Logged: HH Checked: PG
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
5.00	5.40	01:00						

Remarks: Hand dug service inspection pit excavated to 1.20m bgl.

Installation: 50mm diameter standpipe installed to 3.00m bgl.

Diameter: 150mm to 5.00m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

SPT SUMMARY SHEET

Project: Land adjacent to 115 Sale Road, Northern Moor
Client: Seva Patidar Ltd
Project No: AG3225-21

Borehole No.	Borehole depth (m)	Bottom depth (m)	Casing depth (m)	Water Level (m)	Equipment ref.	Seating Drive				Test Drive							Test Type	N Value		
						Blows		Pen (mm)		Blows				Pen (mm)					Total Pen (mm)	
BH1	1.20	1.65	1.00	Dry	LSI1	1	2	75	75	2	2	2	2	75	75	75	75	300	C	8
BH1	2.00	2.45	1.90	Dry	LSI1	2	3	75	75	5	6	6	8	75	75	75	75	300	C	25
BH1	3.00	3.45	2.80	Dry	LSI1	1	2	75	75	3	3	3	4	75	75	75	75	300	S	13
BH1	5.00	5.08	3.00		LSI1	25		75		50				2				2	S	>50
BH1	5.50	5.66	3.00	4.50	LSI1	25		75		41	9			75	10			85	S	>50
BH2	1.20	1.65	1.00		LSI1	1	1	75	75	1	1	1	1	75	75	75	75	300	C	4
BH2	2.00	2.45	1.90		LSI1	1	1	75	75	2	2	3	3	75	75	75	75	300	C	10
BH2	3.00	3.45	2.80		LSI1	2	3	75	75	4	4	5	6	75	75	75	75	300	S	19
BH2	5.00	5.45	3.00		LSI1	10	10	75	75	12	15	23		75	75	75	75	300	S	>50
BH2	5.40	5.65	3.00		LSI1	19	6	75	75	31	19			75	20			95	C	>50

Notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005
2. N values have not been subjected to any correction.
3. Test carried out using split spoon S, or solid cone C.

SPT Hammer Energy Test Report

SI ACCREDITED WITH REFERENCE ISO 17025-2:2005

ARCHWAY ENGINEERING
AIRLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JF

SPT Hammer Ref: 1521
Test Date: 11/09/2020
Report Date: 12/09/2020
File Name: 1521-JAR
Test Operator: JAR

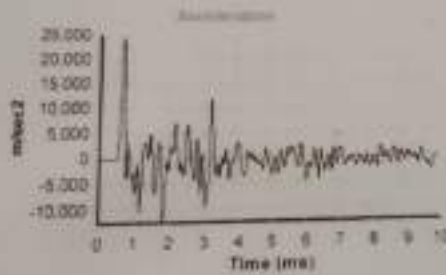
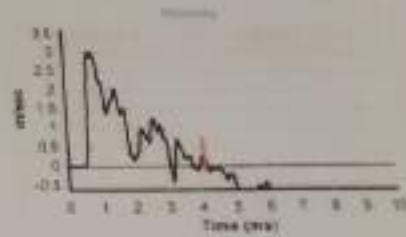
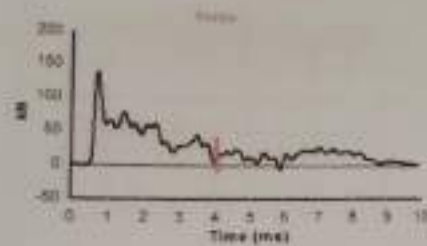
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.3
Assumed Modulus E_r (GPa): 200
Accelerometer No.1: 7080
Accelerometer No.2: 11609

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location



Calculations

Area of Rod A (mm²): 944
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 258

Energy Ratio E_r (%): 55

Signed: M.GARDNER
Title: FITTER

The recommended calibration interval is 12 months

TRIAL PIT LOG

TP1

Project Land adjacent to 115 Sale Road, Northern Moor
Client Seva Patidar Ltd
Date 14/01/2021

Project No. AG3225-21
Sheet 1 of 1
Scale 1:25

Ground Level 99.80m AOD **Coordinates** **Total Depth** 2.00m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES PID	0.20 0.20	PID = 0.0	99.50	(0.30) 0.30	E	Dark grey fine to coarse angular to subangular GRAVEL of limestone/brick. Evidence of burning at surface. (MADE GROUND)		
B D ES PID	0.50 0.50 0.60 0.60	PID = 0.0	98.90	(0.60) 0.90	E	Dark grey brown sandy fine to coarse angular to subangular GRAVEL including glass, brick, ash, plastic, metal and material fragments. (MADE GROUND)		
ES PID	1.40 1.40	PID = 0.0	(1.10)			Light orangish brown slightly gravelly SAND. (GLACIOFLUVIAL DEPOSITS)		
B	1.90		97.80	2.00		End of Trial Pit at 2.00m		

Method: Backhoe excavator

Groundwater: Groundwater not encountered.

Stability: Slight spalling between 1.50m and 2.00m bgl.

Remarks: Soakaway test undertaken within trial pit, see separate results sheet for details. Trial pit backfilled with arisings on completion.

Length:	1.80m
Width:	0.70m
Logged:	HH
Checked:	PG

TRIAL PIT LOG

TP2

Project Land adjacent to 115 Sale Road, Northern Moor

Project No.

AG3225-21

Client Seva Patidar Ltd

Sheet

1 of 1

Date 14/01/2021

Scale

1:25

Ground Level 99.90m AOD

Coordinates

Total Depth

2.30m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES PID	0.20 0.20	PID = 0.0	99.60	(0.30) 0.30	E	Dark brown slightly clayey slightly gravelly SAND with rootlets. Gravel is fine to coarse angular brick, glass and mudstone. (TOPSOIL)		
B	0.50			(0.70)	E	Dark grey slightly clayey sandy fine to coarse angular to subangular GRAVEL with rare cobbles including mudstone, sandstone, brick and glass. Cobbles are angular sandstone and mudstone. (MADE GROUND)		
ES PID	0.80 0.80	PID = 0.0	98.90	1.00				
				(0.50)	E	Orangish brown grey mottled clayey sandy fine to coarse angular to subangular GRAVEL. Gravel includes mudstone and sandstone. (reworked) (MADE GROUND)		
			98.40	1.50				
ES PID B D	1.60 1.60 1.70 1.70	PID = 0.0		(0.50)				
					E	Soft orangish brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to subrounded sandstone and siltstone. (GLACIOFLUVIAL DEPOSITS)		
B	2.00		97.90	2.00				
				(0.30)	E	Light grey sandy fine to coarse angular to subrounded GRAVEL of sandstone, siltstone and mudstone. (GLACIOFLUVIAL DEPOSITS)		
			97.60	2.30				
						End of Trial Pit at 2.30m		

Method: Backhoe excavator

Groundwater: Strike at 2.00m bgl.

Stability: Slight spalling 1.60m to 2.30m bgl.

Remarks: Trial pit terminated at 2.30m bgl due to spalling. Trial pit backfilled with arisings on completion.

Length:	3.00m
Width:	0.70m
Logged:	HH
Checked:	PG

Exploratory Hole Log Key Sheet

Sample Notation		Backfill Symbols		Legend Symbols	
D	Small Disturbed sample		Sand		Topsoil
B	Bulk Disturbed sample		Gravel		Made Ground
ES	Environmental sample		Concrete		Concrete
U	Undisturbed U100 sample		Bentonite		Clay
UT	Undisturbed UT100 sample		Arisings		Silt
C	Core sample		Grout		Sand
W	Water sample				Gravel
In Situ Test Notation		Installation Symbols			Peat
S	Standard Penetration Test		Plain Standpipe		Cobbles
S (C)	Standard Penetration Test (cone)		Slotted Standpipe		Boulders
HV	Hand Shear Vane Test		Piezometer		Mudstone
PID	Photoionization Detector Test		Vibrating Wire Piezometer		Siltstone
MEXE	Mexecone Cone Penetrometer Test		Inclinometer		Sandstone
PP	Pocket Penetrometer Test		Extensometer (with magnet locations)		Limestone
K	Permeability Test				Chalk
Results Notation		Groundwater (GW)			Coal
Cu	Shear Strength		Rise		Breccia
N	SPT N Value		Groundwater Strike - with Recorded Rise		Conglomerate
PID	VOC Concentration		Strike		Shale
()	U/UT Blow Count		Groundwater Strike - No Recorded Rise		Igneous Rock
Rotary Core Notation					Metamorphic Rock
TCR	Total Core Recovery				No Recovery
SCR	Solid Core Recovery				
RQD	Rock Quality Designation				
FI	Fracture Index				
If	Fracture Spacing				
NI	Non Intact				
NR	No Recovery				
NA	Not Applicable				
Ease of Dig					
VE	Very Easy				
E	Easy				
M	Moderate				
H	Hard				
VH	Very Hard				
General Notes					
1. Details of the standpipe/piezometer are given on the log. The 'Install' column shows a graphical representation of the installed including depth of instruments including slotted section or piezometer depth, and backfill details. 2. Standard Penetration Test is defined in BS EN ISO 17892. Total N value is shown on the logs, full details of the test increments, equipment references, water and casing levels shown on the SPT Summary Sheet.					
Note: Most soils comprise a mixture of particle sizes. The soil type is graphically represented on the log and may be a combination of these symbols.					

APPENDIX D

Ground Gas Monitoring and Flow Results

Project Number: AG3225-21

Date and Time of Monitoring: Wednesday 3rd February 2021 - 15:00

Project Name: Land adjacent to 115 Sale Road, Northern Moor

Phase of Monitoring: 1 of 1

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
BH1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	1.5	1.5	20.7	20.7	50	1.46
BH2	<0.1	<0.1	<0.1	<1	<0.1	<0.1	0.2	0.2	21.3	21.3	50	1.43

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH1	0.2	<1	<1	
BH2	0.5	<1	<1	

Borehole specific comments/observations

Meteorological Data

Atmospheric Pressure (mb)	Start: 995
Atmospheric Pressure (mb)	Finish: 995
Pressure Rising or Falling	Falling
Weather Conditions	7/8 cloud cover
Atmospheric Oxygen (% vol)	21.4
Wind Speed & Direction	6mph W
Ambient Air Temperature (°C)	9.0

Site Data

Monitoring Personnel	Jack Welch
GPS Instrument	
Gasmeter Serial Number	G503948
PID Serial Number	110423
Ground Conditions (vegetation stress, visual contamination):	

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLIED GEOLOGY

Gas Monitoring Equipment Specification and Accuracy Details

Instrument Specifications

Instrument	Atmospheric Pressure Range	Temperature Range	Flow Range	Flow Resolution	Borehole Pressure Range
GA5000	500-1500 mb +/- 5 mb	-10°C to + 50°C	0-20 lt/hr +/- 0.3 l/hr	0.1l/hr	.+500/-500 mbar +/- 4 mbar
Phocheck Tiger	-	-20 to + 60°C (Certified to -15 to + 45°C)	-	-	-

Instrument Accuracy

Instrument		Methane	Lower Explosive Limit	Carbon Dioxide	Oxygen	Volatile Organic Compounds	Hydrogen Sulphide	Carbon Monoxide
GA5000	Detection Range	0-100%	-	0 -100%	0-25%	NA	0 -50ppm response <30 secs	0 - 1000ppm response <30 Secs
	Detection Accuracy	./- 0.5% @ 0 to 70%, ./-1.5% @ 70 to 100% Response < 10 secs	N/A	./- 0.5% @ 0 to 60%, ./-1.5% @ 60 to 100% Response < 10 secs	./- 1.0% @ 0 to 25%, Response < 20 secs	NA	./- 1.5% FS	./- 2% of FS
Phocheck Tiger	Detection Range	N/A	N/A	N/A	N/A	1 ppb - 10,000 ppm	N/A	N/A
	Detection Accuracy	N/A	N/A	N/A	N/A	+/- 1ppb +/- 5% of actual displayed accuracy +/- One digit Response < 2sec	N/A	N/A

Calibration Frequency

Equipment Serial Numbers

Instruments are calibrated annually. Details of the instrument calibration certificates and service records are available if required.		
	GA5000 (G503948, G505383, G505737)	
	Phocheck Tiger - (T-108308, T-109597, T-109598, T-110423)	

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Date _____

Start Depth (mm bgl)

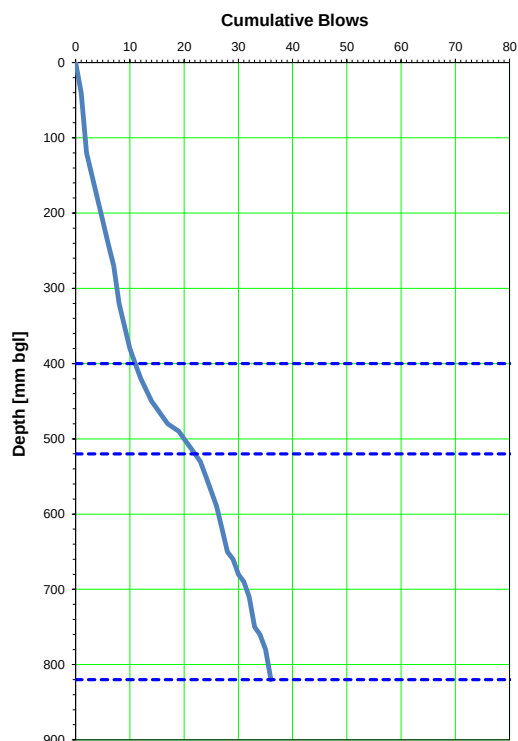
TRL01

27/01/2021

JW

Ground Level

Checked by: SD

[illegible]

Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Grass over wet and soft topsoil. Weather: Raining

Test commenced from ground level.

Client:	Seva Patidar Ltd
Project:	Land adjacent to 115 Sale Road, Northern Moor
Project No.	AG3225-21

APPLIED GEOLOGY

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Date _____

Start Depth (mm bgl)

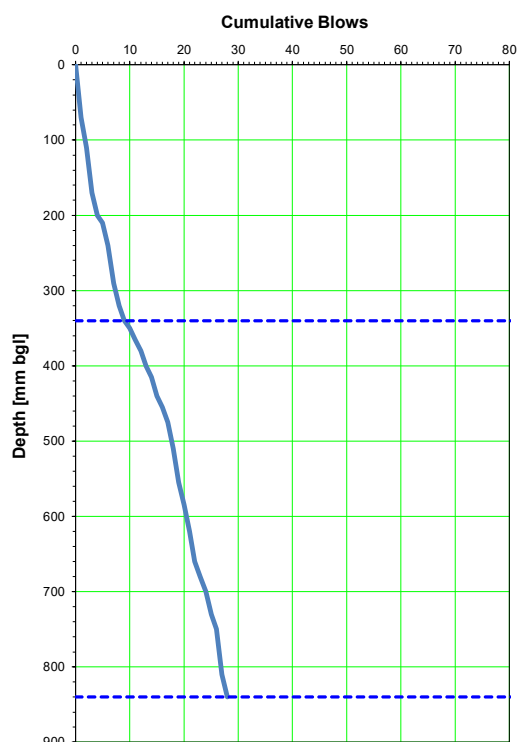
TRL02

27/01/2021

JW

Ground Level

Checked by: SD

[illegible]

Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Grass over wet and soft topsoil. Weather: Raining

Test commenced from ground level.

Client:	Seva Patidar Ltd
Project:	Land adjacent to 115 Sale Road, Northern Moor
Project No.	AG3225-21

APPLiED GEOLOGY

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Test Location

Date _____

Operator

Start Depth (mm bgl)

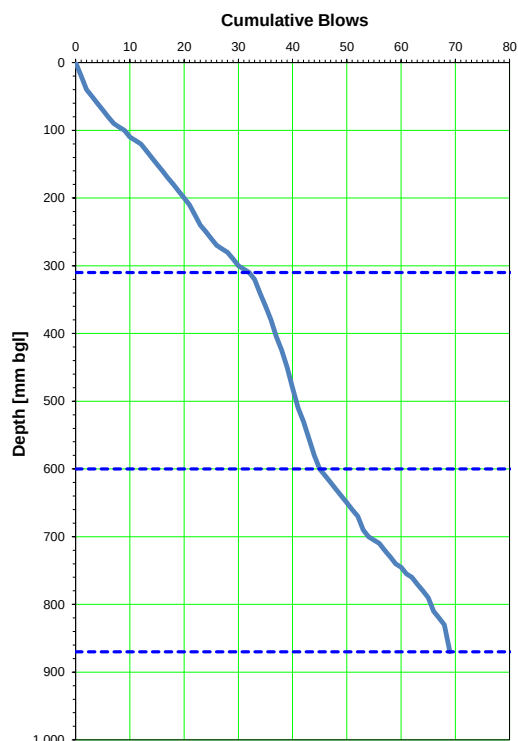
TRL03

27/01/2021

JW

Ground Level

Checked by: SD

[illegible]

Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Loose gravel. Weather: Raining

Remarks:

Test commenced from ground level.

Client:	Seva Patidar Ltd
Project:	Land adjacent to 115 Sale Road, Northern Moor
Project No.	AG3225-21

APPLIED GEOLOGY

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Date _____

Start Depth (mm bgl)

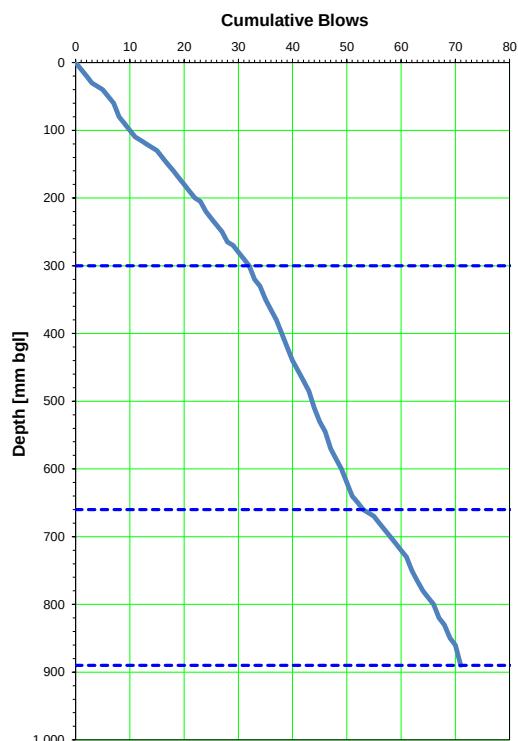
TRL04

27/01/2021

JW

Ground Level

Checked by: SD

[illegible]

Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Loose gravel. Weather: Raining

Test commenced from ground level.

Client:	Seva Patidar Ltd
Project:	Land adjacent to 115 Sale Road, Northern Moor
Project No.	AG3225-21

APPLIED GEOLOGY

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Test Location

Date

Operator

Start Depth (mm bgl)

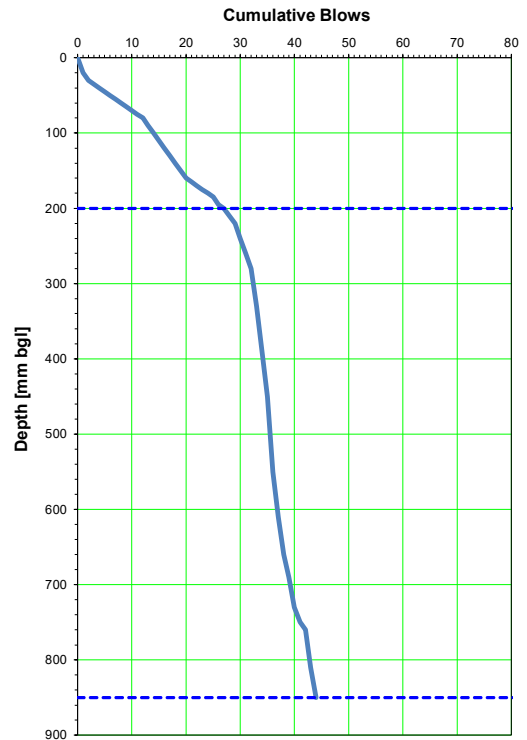
TRL05

27/01/2021

JW

Ground Level

Checked by: SD

[illegible]

Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Loose gravel. Weather: Raining

Remarks:

Test commenced from ground level.

Client:	Seva Patidar Ltd
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Project: Land adjacent to 115 Sale Road, Northern Moor

Project No.	AG3225-21
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APPLiED GEOLOGY

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Test Location

TRL06

Date

27/01/2021

Operator

JW

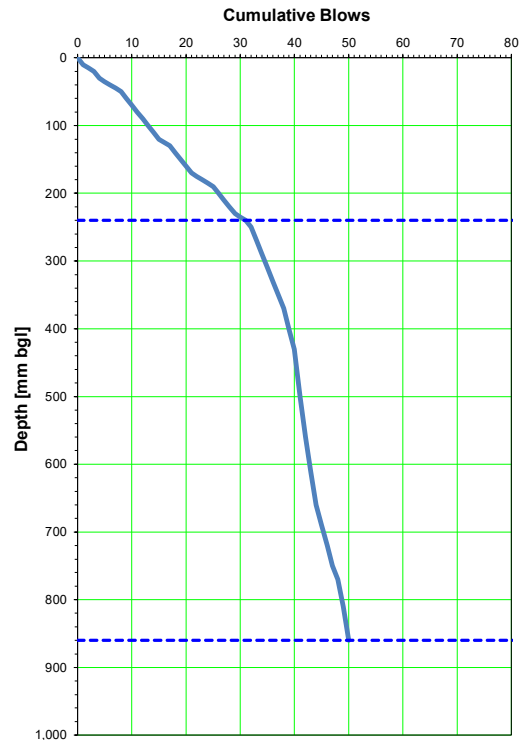
Start Depth (mm bgl)

Ground Level

Checked by:

SD

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	31	31	35	240	240
Layer 2	19	50	8	620	860



Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Loose gravel. Weather: Raining

Remarks:

Test commenced from ground level.

Client: Seva Patidar Ltd

Project: Land adjacent to 115 Sale Road, Northern Moor

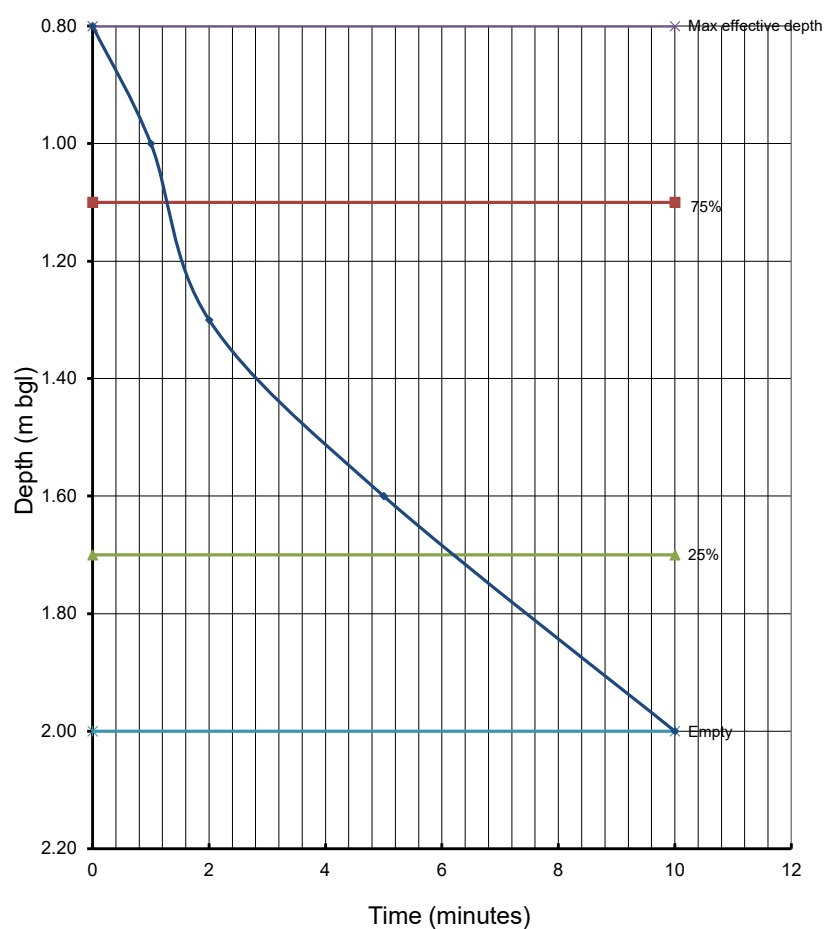
Project No. AG3225-21

APPLIED GEOLOGY

IN SITU SOAKAWAY TEST RESULT

Trial Pit No.	TP01
Date	14/01/2021
Operator	HH
Test Strata	Glaciofluvial Sheet Deposits – Sand
Stability of pit	Spalling in MG
Backfill used	10mm Gravel

Filling	1 of 3
Trial Pit Length (m)	1.80
Trial Pit Width (m)	0.70
Trial Pit Depth (m)	2.00
Amount of Backfill placed (m)	2
Assumed Backfill Void Ratio	0.3

[illegible]

Initial Water Level (m)	0.80	Total internal surface area of pit (m ²)	11.26
Final Water Level (m)	2.00	Internal surface area of trial pit within effective depth range (m ²)	4.26
Change in Water Level (m)	1.20	Volume outflowing between 75% and 25% effective depth (m ³)	0.23
Effective Depth at 25% (tp25) (m)	1.70	Time at 25% (tp25) (minutes)	6.25
Effective Depth at 75% (tp75) (m)	1.10	Time at 75% (tp75) (minutes)	1.25

Soil Infiltration Rate (m/s)	1.77E-04
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Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data NO

* Water level did not drop sufficiently for the calculation to be made

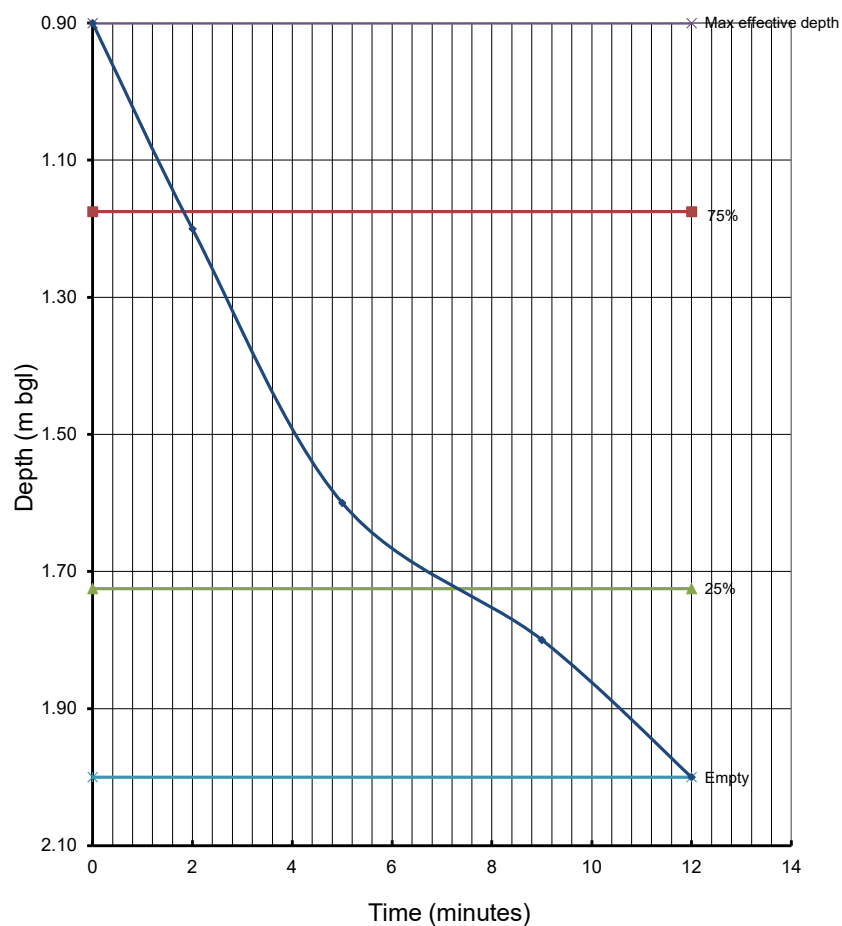
Client:	Seva Patidar Ltd
Project:	Land adjacent to 115 Sale Road, Northern Moor
Project No.	AG3225-21

APPLiED GEOLOGY

IN SITU SOAKAWAY TEST RESULT

Trial Pit No.	TP01
Date	14/01/2021
Operator	HH
Test Strata	Glaciofluvial Sheet Deposits – Sand
Stability of pit	Spalling in MG
Backfill used	10mm Gravel

Filling	2 of 3
Trial Pit Length (m)	1.80
Trial Pit Width (m)	0.70
Trial Pit Depth (m)	2.00
Amount of Backfill placed (m)	2
Assumed Backfill Void Ratio	0.3

[illegible]

Initial Water Level (m)	0.90	Total internal surface area of pit (m ²)	11.26
Final Water Level (m)	2.00	Internal surface area of trial pit within effective depth range (m ²)	4.01
Change in Water Level (m)	1.10	Volume outflowing between 75% and 25% effective depth (m ³)	0.21
Effective Depth at 25% (tp25) (m)	1.73	Time at 25% (tp25) (minutes)	7.25
Effective Depth at 75% (tp75) (m)	1.18	Time at 75% (tp75) (minutes)	1.75

Soil Infiltration Rate (m/s)	1.57E-04
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Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data NO

* Water level did not drop sufficiently for the calculation to be made

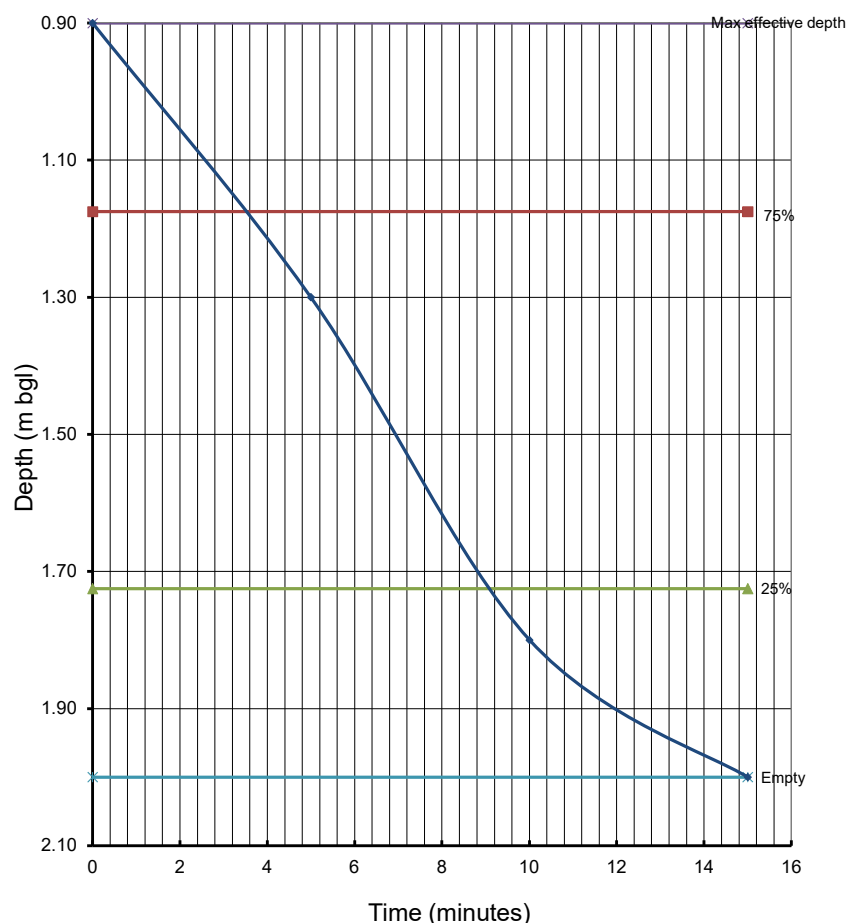
Client:	Seva Patidar Ltd
Project:	Land adjacent to 115 Sale Road, Northern Moor
Project No.	AG3225-21

APPLIED GEOLOGY

IN SITU SOAKAWAY TEST RESULT

Trial Pit No.	TP01
Date	14/01/2021
Operator	HH
Test Strata	Glaciofluvial Sheet Deposits – Sand
Stability of pit	Spalling in MG
Backfill used	10mm Gravel

Filling	3 of 3
Trial Pit Length (m)	1.80
Trial Pit Width (m)	0.70
Trial Pit Depth (m)	2.00
Amount of Backfill placed (m)	2
Assumed Backfill Void Ratio	0.3

[illegible]

Initial Water Level (m)	0.90	Total internal surface area of pit (m ²)	11.26
Final Water Level (m)	2.00	Internal surface area of trial pit within effective depth range (m ²)	4.01
Change in Water Level (m)	1.10	Volume outflowing between 75% and 25% effective depth (m ³)	0.21
Effective Depth at 25% (tp25) (m)	1.73	Time at 25% (tp25) (minutes)	8.5
Effective Depth at 75% (tp75) (m)	1.18	Time at 75% (tp75) (minutes)	1

Soil Infiltration Rate (m/s)	1.15E-04
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Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data NO

* Water level did not drop sufficiently for the calculation to be made

Client:	Seva Patidar Ltd
Project:	Land adjacent to 115 Sale Road, Northern Moor
Project No.	AG3225-21

APPLIED GEOLOGY

APPENDIX E

SOIL CHEMICAL RESULTS COMPARED AGAINST SCREENING VALUES FOR HUMAN HEALTH

Site: Land adjacent to 115 Sale Road, Northern Moor
Job No: AG3225-21

Land Use: Residential without Plant Uptake

Dataset: All results

Soil Organic Matter (%) 6.0 %

Exploratory Hole Reference	BH02	TP01	TP01	TP02	Spoil mound	BH02	BH01	No. of samples (n)	Residential without Plant Uptake	Source/Justification
Depth (m)	1.50	0.20	0.60	0.80	0.00	0.10	0.30			
Strata	Nat	MG	MG	MG	MG	MG	MG			
	Units									
Organic Matter (%)	%	1.4	8.5	3.4	5.5	5.9		5		
pH	pH Units	8.1	8.1	7.4	7.6	7		5		
Arsenic	mg/kg	6.7	37	11	34	23		5	40	LOM/CIEH SAUL (2015)
Beryllium	mg/kg	0.56	0.65	0.54	1.1	1.1		5		LOM/CIEH SAUL (2015)
Boron - Total	mg/kg	1.9	33	7.1	7.6	6		5	11000	LOM/CIEH SAUL (2015)
Cadmium	mg/kg	0.2	2	1.2	1.3	0.9		5	85	LOM/CIEH SAUL (2015)
Chromium (total)	mg/kg	14	50	24	26	19		5		LOM/CIEH SAUL (2015)
Chromium - III	mg/kg	13	49	24	25	16		5	910	LOM/CIEH SAUL (2015)
Chromium (VI) Screen	mg/kg	4.0	4.0	4.0	4.0	4.0		5	6	LOM/CIEH SAUL (2015)
Copper	mg/kg	15	210	63	130	66		5	7100	LOM/CIEH SAUL (2015)
Lead	mg/kg	18	270	160	180	180		5	310	C4SL (2014)
Mercury (Total)	mg/kg	0.3	0.3	0.4	0.7	0.5		5	56	LOM/CIEH SAUL (2015)
Nickel	mg/kg	9.3	21	15	25	21		5	180	LOM/CIEH SAUL (2015)
Selenium	mg/kg	1.0	1.0	1.0	1.0	1.0		5	430	LOM/CIEH SAUL (2015)
Vanadium	mg/kg	16	28	19	34	29		5	1200	LOM/CIEH SAUL (2015)
Zinc	mg/kg	72	1700	480	380	170		5	40000	LOM/CIEH SAUL (2015)
Naphthalene	mg/kg	0.05	0.05	0.05	2.6	0.05		5	13	LOM/CIEH SAUL (2015)
Acenaphthylene	mg/kg	0.05	0.05	0.05	0.05	0.05		5	6000	LOM/CIEH SAUL (2015)
Acenaphthene	mg/kg	0.05	0.05	0.05	4.9	0.05		5	6000	LOM/CIEH SAUL (2015)
Fluorene	mg/kg	0.05	0.05	0.05	3.5	0.05		5	4500	LOM/CIEH SAUL (2015)
Phenanthrene	mg/kg	0.05	0.39	0.05	43	2.8		5	1500	LOM/CIEH SAUL (2015)
Anthracene	mg/kg	0.05	0.05	0.05	10	0.63		5	37000	LOM/CIEH SAUL (2015)
Fluoranthene	mg/kg	0.05	0.62	0.96	56	5.3		5	1800	LOM/CIEH SAUL (2015)
Pyrene	mg/kg	0.05	0.6	1.1	44	4.7		5	3800	LOM/CIEH SAUL (2015)
Benzo[a]anthracene	mg/kg	0.05	0.05	0.65	28	3.3		5	*	LOM/CIEH SAUL (2015)
Chrysene	mg/kg	0.05	0.05	0.65	22	2.5		5	*	LOM/CIEH SAUL (2015)
Benzo[b]fluoranthene	mg/kg	0.05	0.05	0.85	31	3.5		5	*	LOM/CIEH SAUL (2015)
Benzo[k]fluoranthene	mg/kg	0.05	0.05	0.35	12	1.7		5	*	LOM/CIEH SAUL (2015)
Benzo[a]pyrene	mg/kg	0.05	0.05	0.05	2.9	0.05		5	5.3	LOM/CIEH SAUL (2015)
Dibenzo[a,h]anthracene	mg/kg	0.05	0.05	0.05	2.9	0.05		5	*	LOM/CIEH SAUL (2015)
Indeno[1,2,3-cd]pyrene	mg/kg	0.05	0.05	0.05	9.7	1.5		5	*	LOM/CIEH SAUL (2015)
Benzo[g,h,i]perylene	mg/kg	0.05	0.05	0.05	11	1.6		5	*	LOM/CIEH SAUL (2015)
Total of 16 PAHs	mg/kg	0.80	1.61	5.24	303	30.5		5		
Phenols (Total)	mg/kg	1	1	1	1	1		5	1200	LOM/CIEH SAUL (2015)
Benzene	mg/kg		0.016	0.001		0.001		3	1.4	LOM/CIEH SAUL (2015)
Toluene	mg/kg		0.012	0.001		0.001		3	3900	LOM/CIEH SAUL (2015)
Ethylbenzene	mg/kg		0.0036	0.001		0.001		3	440	LOM/CIEH SAUL (2015)
m,p Xylene	mg/kg		0.0072	0.001		0.001		3	430	LOM/CIEH SAUL (2015)
o-Xylene	mg/kg		0.0061	0.001		0.001		3	480	LOM/CIEH SAUL (2015)
Aliphatic TPH >C5-C6	mg/kg		0.001	0.001		0.001		3	160	LOM/CIEH SAUL (2015)
Aliphatic TPH >C6-C8	mg/kg		0.001	0.001		0.001		3	530	LOM/CIEH SAUL (2015)
Aliphatic TPH >C8-C10	mg/kg		0.001	0.001		0.001		3	150	LOM/CIEH SAUL (2015)
Aliphatic TPH >C10-C12	mg/kg		1.0	1.0		1.0		3	770	LOM/CIEH SAUL (2015)
Aliphatic TPH >C12-C16	mg/kg		0.05	2.0	2.0	2.0		3	4400	LOM/CIEH SAUL (2015)
Aliphatic TPH >C16-C21	mg/kg		8.0	8.0		8.0		3	*	LOM/CIEH SAUL (2015)
Aliphatic TPH >C21-C35	mg/kg		8	8		8		3	110000	LOM/CIEH SAUL (2015)
Aliphatic TPH >C35-C44	mg/kg		8.4	8.4		8.4		3	110000	LOM/CIEH SAUL (2015)
Total Aliphatic Hydrocarbons	mg/kg		10	10		10		3		
Aromatic TPH >C5-C7	mg/kg		0.016	0.001		0.001		3	1400	LOM/CIEH SAUL (2015)
Aromatic TPH >C7-C9	mg/kg		0.012	0.001		0.001		3	3900	LOM/CIEH SAUL (2015)
Aromatic TPH >C9-C10	mg/kg		0.017	0.001		0.001		3	270	LOM/CIEH SAUL (2015)
Aromatic TPH >C10-C12	mg/kg		1.0	1.0		1.3		3	1200	LOM/CIEH SAUL (2015)
Aromatic TPH >C12-C16	mg/kg		2.0	2.0		8.9		3	2500	LOM/CIEH SAUL (2015)
Aromatic TPH >C16-C21	mg/kg		10	10		59		3	1900	LOM/CIEH SAUL (2015)
Aromatic TPH >C21-C35	mg/kg		10	10		72		3	1900	LOM/CIEH SAUL (2015)
Aromatic TPH >C35-C44	mg/kg		8.4	8.4		8.4		3	1900	LOM/CIEH SAUL (2015)
Total Aromatic Hydrocarbons	mg/kg		10	10		140		3		
Total Petroleum Hydrocarbons	mg/kg		10	10		140		3		
Asbestos ID	Detection		Detected	Not-detected	Detected		Not-detected	5		Detection Limit
Asbestos ID	Description		Chrysotile	Chrysotile	Chrysotile			2		Detection Limit
Asbestos Quantity	%		0.001	-	0.001			2		Detection Limit

Key -
Value within sample set exceeds screening value
Statistical value exceeds screening value

LOM/CIEH SAUL Reference No. S4UL3159 (2015)
Values in bold are reported at the laboratory limit of detection

SUMMARY OF LEACHATE TEST RESULTS

Site Land adjacent to 115 Sale Road, Northern Moor
 Job Number AG3225-21
 Type of Water Leachate

Determinand	Limit of Detection	Hazardous or Non-Hazardous^	Sample Identity Depth Sampled Date	BH02 0.1m 14/01/2021	TP02 0.2m 14/01/2021	No. of samples (n)	Waters Screening Value	Source & Justification
pH		-	-	7.1	7.2	2	-	-
TOC		-	mg l ⁻¹	4.98	5.95	2	-	-
Arsenic	1.1	Haz	µg l ⁻¹	4.5	1	2	50	UK Drinking Water Standards (2010)
Cadmium	0.08	Non Haz	µg l ⁻¹	0.08	0.08	2	5	UK Drinking Water Standards (2010)
Chromium (Total)	0.4	Non Haz	µg l ⁻¹	0.4	1.5	2	50	UK Drinking Water Standards (2010)
Chromium (III)	1	Non Haz	µg l ⁻¹	1	1.5	2	50	UK Drinking Water Standards (2010)
Chromium (VI)	5	Haz	µg l ⁻¹	5	5	2	5	Detection Limit
Copper	0.7	Non Haz	µg l ⁻¹	14	13	2	2000	UK Drinking Water Standards (2010)
Lead	1	Haz	µg l ⁻¹	1.9	14	2	10	UK Drinking Water Standards (2010)
Mercury	0.5	Haz	µg l ⁻¹	0.5	0.5	2	1	UK Drinking Water Standards (2010)
Nickel	0.3	Non Haz	µg l ⁻¹	2.9	3	2	20	UK Drinking Water Standards (2010)
Selenium	4	Non Haz	µg l ⁻¹	4	4	2	10	UK Drinking Water Standards (2010)
Zinc	0.4	Non Haz	µg l ⁻¹	2.5	21	2	5000	UK Drinking Water Standards (2010)
Boron	10	Non Haz	µg l ⁻¹	220	18	2	1000	UK Drinking Water Standards (2010)
Beryllium	0.2	Non Haz	µg l ⁻¹	0.2	0.2	2	12	UK Drinking Water Standards (2010)
Vanadium	1.7	Non Haz	µg l ⁻¹	1.7	1.7	2	20-60	EQS
Sulphate	0.045	Non Haz	mg l ⁻¹	6.3	2.1	2	250	UK Drinking Water Standards (2010)
Phenol	1	Non Haz	µg l ⁻¹	1.0	1.0	2	7.7	WFD Environmental Standard, 2010
Naphthalene	0.01	Non Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Acenaphthylene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Acenaphthene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Fluorene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Phenanthrene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Anthracene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Fluoranthene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Pyrene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Benzo[a]anthracene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Chrysene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Benzo[b]fluoranthene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Benzo[k]fluoranthene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Benzo[a]pyrene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Dibenz[a,h]Anthracene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Indeno(1,2,3-c,d)Pyrene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit
Benzo[g,h,i]perylene	0.01	Haz	µg l ⁻¹	0.01	0.01	2	0.5	Detection limit

Key-

Result exceeds test screening criteria

Values in bold at the limit of detection

^ Note: Hazardous and non-hazardous substances determined by JAGDAG (Jan 2017) and published at <http://www.wfduk.org/sites/default/files/Media/170116%20Substance%20Determinationsfinal.pdf>. These are marked in bold.
 For substances not assessed by JAGDAG, Applied Geology has assumed a determination based on our understanding of the behaviour of the chemical. These determinations are highlighted in yellow.



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Analytical Report Number : 21-51325

Project / Site name:	115 Sale Road	Samples received on:	15/01/2021
Your job number:	AG3225.21	Samples instructed on/ Analysis started on:	15/01/2021
Your order number:	16379	Analysis completed by:	22/01/2021
Report Issue Number:	1	Report issued on:	22/01/2021
Samples Analysed:	2 leachate samples - 7 soil samples		


Signed:

Rachel Bradley
Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road
Your Order No: 16379

Lab Sample Number				1738728	1738729	1738730	1738731	1738732
Sample Reference				BH01	BH02	BH02	TP01	TP01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	1.50	0.20	0.60
Date Sampled				13/01/2021	14/01/2021	14/01/2021	14/01/2021	14/01/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	-	17	14	32	7.8
Total mass of sample received	kg	0.001	NONE	-	0.4	0.5	1.5	1.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	8.1	8.1	7.4
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	38	540	520
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.019	0.27	0.26
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	19.1	270	259
Organic Matter	%	0.1	MCERTS	-	-	1.4	8.5	3.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.39	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.62	0.96
Pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.6	1.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.65
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.65
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.85
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.35
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.69
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	< 0.80	1.61	5.24
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Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road
Your Order No: 16379

Lab Sample Number				1738728	1738729	1738730	1738731	1738732
Sample Reference				BH01	BH02	BH02	TP01	TP01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	1.50	0.20	0.60
Date Sampled				13/01/2021	14/01/2021	14/01/2021	14/01/2021	14/01/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	6.7	37	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.56	0.65	0.54
Boron (total)	mg/kg	1	MCERTS	-	-	1.9	33	7.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	2	1.2
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	-	-	13	49	24
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	14	50	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	15	210	63
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	18	270	160
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	9.3	21	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	16	28	19
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	72	1700	480
Magnesium (water soluble)	mg/kg	5	NONE	-	-	5.7	40	< 5.0

Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road
Your Order No: 16379

Lab Sample Number				1738728	1738729	1738730	1738731	1738732
Sample Reference				BH01	BH02	BH02	TP01	TP01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	1.50	0.20	0.60
Date Sampled				13/01/2021	14/01/2021	14/01/2021	14/01/2021	14/01/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-	< 1.0	-	16	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	12	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	3.6	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	7.2	< 1.0
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	6.1	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	-	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	-	< 10	-	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	0.016	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	0.012	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	0.017	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	1.3	-	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	8.9	-	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	59	-	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	72	-	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	-	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	140	-	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	-	140	-	< 10	< 10

TPHCWG - Total C5 - C44 Aliphatic & Aromatic	mg/kg	10	NONE	-	140	-	< 10	< 10
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road
Your Order No: 16379

Lab Sample Number				1738733	1738734
Sample Reference				TP02	Spoil 1
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	None Supplied
Date Sampled				14/01/2021	14/01/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	18
Total mass of sample received	kg	0.001	NONE	0.5	0.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	7
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	38	38
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019	0.019
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	18.9	18.8
Organic Matter	%	0.1	MCERTS	5.5	5.9

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	2.6	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	4.9	< 0.05
Fluorene	mg/kg	0.05	MCERTS	3.5	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	43	2.8
Anthracene	mg/kg	0.05	MCERTS	10	0.63
Fluoranthene	mg/kg	0.05	MCERTS	56	5.3
Pyrene	mg/kg	0.05	MCERTS	44	4.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	28	3.3
Chrysene	mg/kg	0.05	MCERTS	22	2.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	31	3.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	12	1.7
Benzo(a)pyrene	mg/kg	0.05	MCERTS	23	3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	9.7	1.5
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.9	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	11	1.6

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	303	30.5
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Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road
Your Order No: 16379

Lab Sample Number				1738733	1738734
Sample Reference				TP02	Spoil 1
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	None Supplied
Date Sampled				14/01/2021	14/01/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	34	23
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.1
Boron (total)	mg/kg	1	MCERTS	7.6	6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.3	0.9
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	25	16
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	130	66
Lead (aqua regia extractable)	mg/kg	1	MCERTS	690	180
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	29
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	380	170
Magnesium (water soluble)	mg/kg	5	NONE	7.5	9.6

Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road
Your Order No: 16379

Lab Sample Number				1738733	1738734
Sample Reference				TP02	Spoil 1
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	None Supplied
Date Sampled				14/01/2021	14/01/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	-	-
Toluene	µg/kg	1	MCERTS	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-
o-xylene	µg/kg	1	MCERTS	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	-	-

TPHCWG - Total C5 - C44 Aliphatic & Aromatic	mg/kg	10	NONE	-	-
--	-------	----	------	---	---

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road
Your Order No: 16379

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1738732	TP01	0.60	161	Loose Fibres	Chrysotile	< 0.001	< 0.001
1738734	Spoil 1		156	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number: 21-51325
Project / Site name: 115 Sale Road

Your Order No: 16379

Lab Sample Number	1738735	1738736
Sample Reference	BH02	TP02
Sample Number	None Supplied	None Supplied
Depth (m)	0.10	0.20
Date Sampled	14/01/2021	14/01/2021
Time Taken	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection Accreditation Status

General Inorganics

pH	pH Units	N/A	ISO 17025	7.1	7.2
Sulphate as SO4	mg/l	0.1	ISO 17025	6.3	2.1
Total Organic Carbon (TOC)	mg/l	0.1	NONE	4.98	5.95

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2
-------------------	------	-----	------	-------	-------

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	4.5	< 1.0
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.2
Boron (dissolved)	µg/l	10	ISO 17025	220	18
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	1.5
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	1.5
Copper (dissolved)	µg/l	0.7	ISO 17025	14	13
Lead (dissolved)	µg/l	1	ISO 17025	1.9	14
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.9	3
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	2.5	21

Magnesium (dissolved)	mg/l	0.005	ISO 17025	1.1	0.45
-----------------------	------	-------	-----------	-----	------

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-51325

Project / Site name: 115 Sale Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1738729	BH02	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
1738730	BH02	None Supplied	1.5	Light brown clay and sand with gravel.
1738731	TP01	None Supplied	0.2	Black gravelly loam with metal and vegetation.
1738732	TP01	None Supplied	0.6	Brown loam and clay with gravel.
1738733	TP02	None Supplied	0.8	Brown loam and clay with gravel.
1738734	Spoil 1	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 21-51325
Project / Site name: 115 Sale Road

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L1028-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In house method.	L005-PL	W	ISO 17025

Analytical Report Number : 21-51325
Project / Site name: 115 Sale Road

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Cr (III) in leachate	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG Ali Aro Sum	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Applied Geology Ltd

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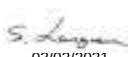
CV8 2LY

For the attention of Hannah Hadwin

Report No: B25530

Issue No 01

LABORATORY TEST REPORT

Project Name	SALE ROAD		
Project Number	B25530	Date samples received	20/01/2021
Your Ref	AG3225-21	Date written instructions received	20/01/2021
Purchase Order	16380	Date testing commenced	20/01/2021
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
1	4	Summary of Geotechnical Tests	See report
2-3	2	Atterberg Limit	Yes
4-5	2	Particle Size Distribution	Yes
6-7	2	Unconsolidated Undrained Single Stage Triaxial Compression	Yes
Remarks :			
Issued by : Stephen Langman		Date of Issue : 03/02/2021	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  03/02/2021			
S Langman (Laboratory Coordinator), D Bowen (Production Manager)			
Unless we are notified to the contrary, samples will be disposed after a period of one month from this date. The results reported relate to samples received in the laboratory only. All results contained in this report are provisional unless signed by an approved signatory This report should not be reproduced except in full without the written approval of the laboratory. Under multisite accreditation the testing contained in this report may have been performed at another Terra Tek laboratory. The enclosed results remain the property of Terra Tek Limited and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation. Feedback on the this report may be left via our website www.terratek.co.uk/contact-us			



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TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES				Site SALE ROAD												Contract No AG3225-21							
				Client																			
				Engineer																			
Sample Identification				Lab Sample ID	Non Engineering Sample Description	Moisture Content	Atterberg limits					Particle Density	Density		Total Stress				Thermal Conductivity	Electrical Resistivity			
Exploratory Hole	Depth m	Sample Ref	Sample Type				Liquid Limit	Plastic Limit	Plasticity Index	Percentage retained 425µm	Atterberg Classification		Bulk	Dry	Shear Strength (Hand Vane)	Shear Strength (Triaxial)	Apparent Cohesion C	Angle of Shearing Resistance Phi					
BH01	3.00-3.45		D	758706	Brown sandy CLAY.	17	27	11	16	0	CL	Mg/m³	Mg/m³	Mg/m³	kPa	kPa	kPa		W/m°C	Ohm.cm			
BH01	4.00-4.45		U	758704	Brown sandy CLAY with some gravel. Gravel is fine to coarse.	15							2.21	1.92		132							
BH02	4.00-4.45		U	758703	Brown sandy CLAY with some gravel. Gravel is fine to medium.	15							2.19	1.90		83							
TP02	1.70		D	758713	Brown very sandy CLAY with much gravel. Gravel is fine to medium.	25.2	30	17	13	27	CL												
Notes				Opinions and interpretations are outside the scope of UKAS accreditation		UKAS Accredited Test Y/N		Y	Y	Y	Y	Y	-	Y	Y	Y	N	Y	-	-	N	N	
Originator		Checked & Approved		SUMMARY OF GEOTECHNICAL TESTS																		Tk Figure 1	
PM		S. Langan 03/02/2021																					
Sheet 1 of 1																							



Site SALE ROAD

Client

Engineer

Contract No. AG3225-21

Hole ID BH01

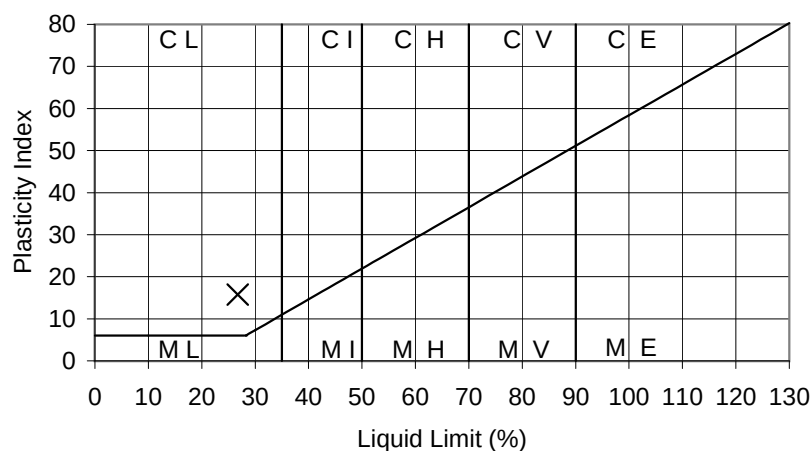
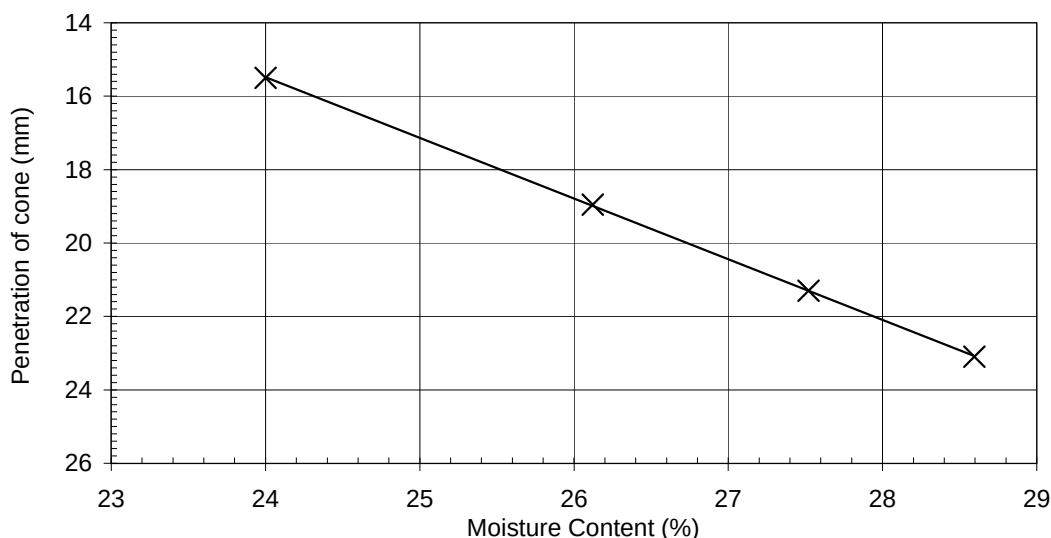
Sample Ref

Depth (m) 3.00-3.45

Sample Type D

Non Engineering Description : Brown sandy CLAY.

Preparation : Sample as received



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	17 %
Percentage retained on 425µm sieve :	0 %
Liquid Limit :	27 %
Plastic Limit :	11 %
Plasticity Index :	16
Equivalent moisture content of material passing 425µm sieve :	17 %
Liquidity Index :	0.38

Originator

Checked & Approved

LB/ME

03/02/2021

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS 1377:Part 2:Clause 4.3:1990

BS 1377:Part 2:Clause 5:1990



Figure 2

Sheet 1 of 1



Site SALE ROAD

Client

Engineer

Contract No. AG3225-21

Hole ID TP02

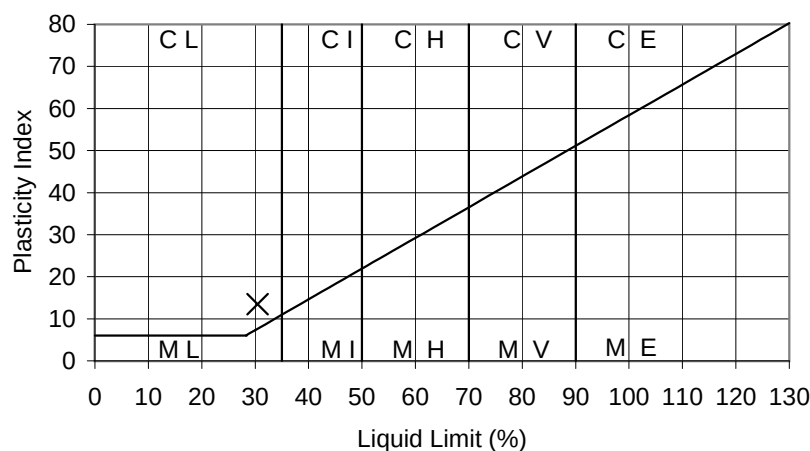
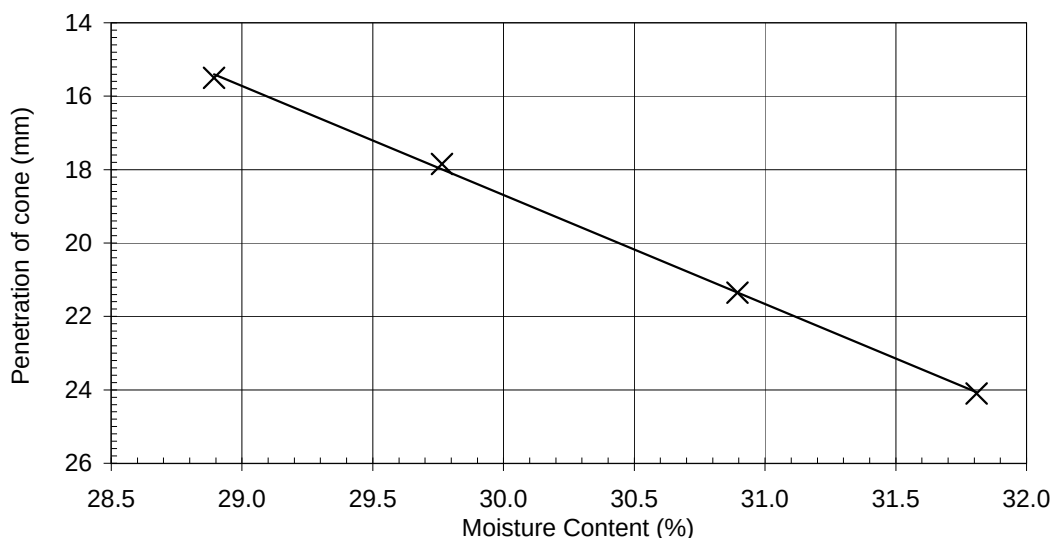
Sample Ref

Depth (m) 1.70

Sample Type D

Non Engineering Description : Brown very sandy CLAY with much gravel. Gravel is fine to medium.

Preparation : Sample washed and air dried



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	25 %
Percentage retained on 425µm sieve :	27 %
Liquid Limit :	30 %
Plastic Limit :	17 %
Plasticity Index :	13
Equivalent moisture content of material passing 425µm sieve :	34 %
Liquidity Index :	1.31

Originator

Checked & Approved

KP

03/02/2021

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS 1377:Part 2:Clause 4.3:1990

BS 1377:Part 2:Clause 5:1990



Figure 3

Sheet 1 of 1

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

SALE ROAD

Client

Engineer

Contract No

AG3225-21

Hole

BH02

Sample Ref

Depth (m)

1.60-2.00

Sample Type

B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	98
5.00 mm	98
3.35 mm	97
2.00 mm	95
1.18 mm	92
630 µm	82
425 µm	68
300 µm	46
200 µm	31
150 µm	26
63 µm	19

Non Engineering Description

Brown clayey SAND with occasional gravel. Gravel is fine to medium.

Sample Proportions - %

Cobbles	0.0
Gravel	4.9
Sand	75.7
Silt & Clay	19.4

Particle Diameter - mm

D100	14
D60	0.37
D10	
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	N/A

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt			Sand			Gravel				

Percentage Passing - %

Particle Size (mm)	Percentage Passing (%)
0.075	19
0.15	26
0.3	31
0.6	46
1.2	68
2.5	82
5.0	92
10	95
20	97
40	98
75	100

Particle Size - mm

Originator

DS

Checked & Approved

03/02/2021

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

Figure 4

Sheet 1 of 1

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

SALE ROAD

Client

Engineer

Contract No

AG3225-21

Hole

TP01

Sample Ref

Depth (m)

1.90

Sample Type

B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	95
28.0 mm	93
20.0 mm	89
14.0 mm	86
10.0 mm	83
6.30 mm	79
5.00 mm	77
3.35 mm	75
2.00 mm	72
1.18 mm	68
630 µm	58
425 µm	44
300 µm	27
200 µm	16
150 µm	12
63 µm	7

Non Engineering Description

Brown SAND with much gravel. Gravel is fine to coarse.

Sample Proportions - %

Cobbles	0.0
Gravel	28.0
Sand	65.2
Silt & Clay	6.7

Particle Diameter - mm

D100	50
D60	0.72
D10	0.11
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	6.5

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt			Sand			Gravel				

Percentage Passing - %

Particle Size - mm

Originator

DS

Checked & Approved

03/02/2021

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

Tk

Figure 5

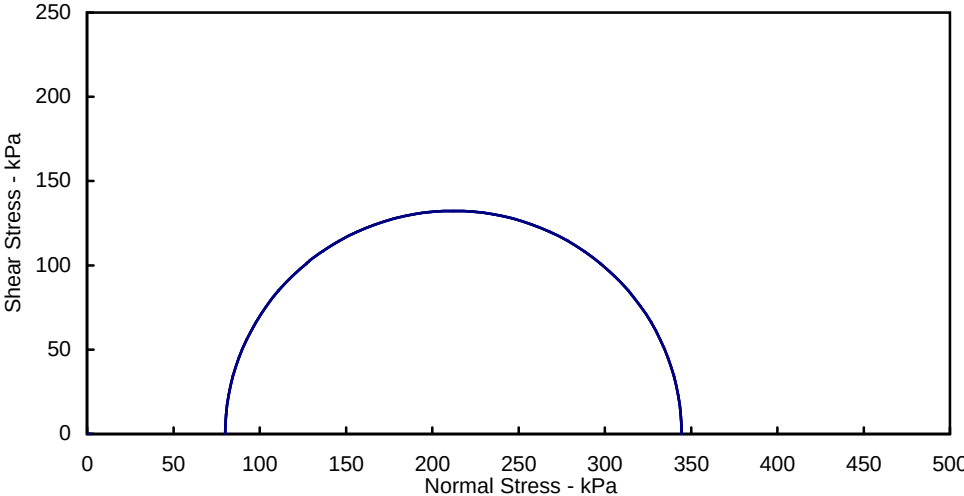
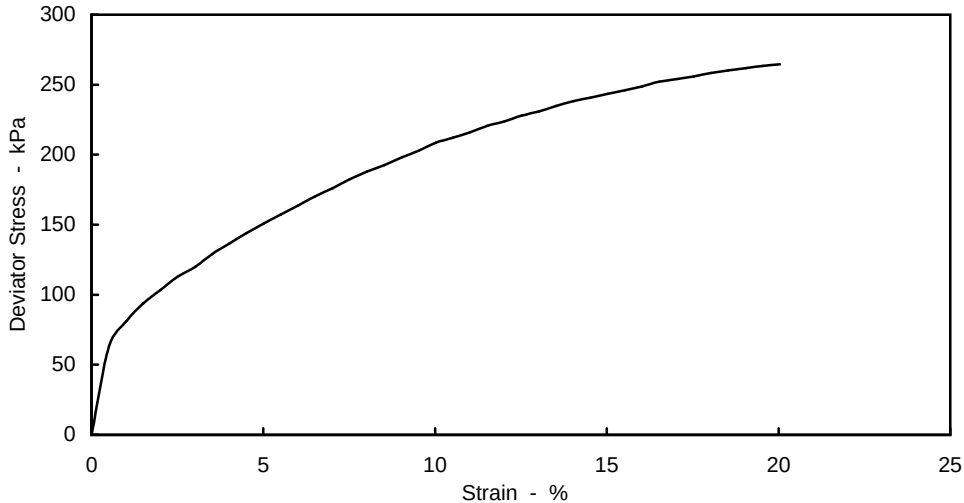
Sheet 1 of 1

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	SALE ROAD	Contract No.	AG3225-21
	Client		Hole	BH01
	Engineer		Sample Ref	
			Depth (m)	4.00-4.45
			Sample Type	U

Sample Details		Undisturbed		
Sample Condition				
Height	mm	199.6		
Diameter	mm	102.4		
Moisture Content	%	15		
Bulk Density	Mg/m³	2.21		
Dry Density	Mg/m³	1.92		
Test Details				
Membrane Thickness	mm	0.20		
Membrane Correction	kPa	0.74		
Rate of Axial Displacement	%/min	2.00		
Cell Pressure	kPa	80		
Strain at Failure	%	20.0		
Maximum Deviator Stress	kPa	265		
Shear Strength	kPa	132		
Mode of Failure			Plastic	
Non Engineering Description		Brown sandy CLAY with some gravel. Gravel is fine to coarse.		

Comments
 Undisturbed specimen taken 100mm below top of tube

Shear Strength Parameters		
C	n/a	kPa
Phi	n/a	°



Originator	Checked & Approved	UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION BS 1377 : Part 7 : 1990 Clause 8	Figure 6 Sheet 1 of 2
ME	<i>S. Laguerre</i> 03/02/2021		

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	SALE ROAD	Contract No	AG3225-21
	Client		Hole	BH01
	Engineer		Sample Ref	
			Depth (m)	4.00-4.45
			Sample Type	U




Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.	Tk Figure 6
ME	<i>S. Lagan</i> 03/02/2021		

Sheet 2 of 2

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site SALE ROAD

Client

Engineer

Contract No. **AG3225-21**

Hole BH02

Sample Ref

Depth (m) 4.00-4.45

Sample Type U

Sample Details

Sample Condition	Undisturbed
Height mm	199.5
Diameter mm	102.4
Moisture Content %	15
Bulk Density Mg/m ³	2.19
Dry Density Mg/m ³	1.91

Test Details

Membrane Thickness mm	0.20
Membrane Correction kPa	0.74
Rate of Axial Displacement %/min	2.01
Cell Pressure kPa	80
Strain at Failure %	20.1
Maximum Deviator Stress kPa	165
Shear Strength kPa	83
Mode of Failure	Plastic

Non Engineering Description

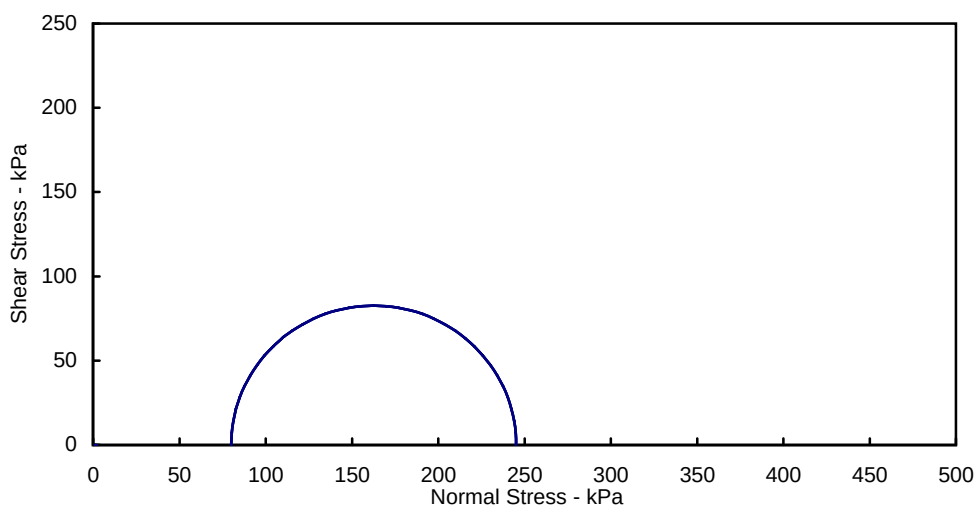
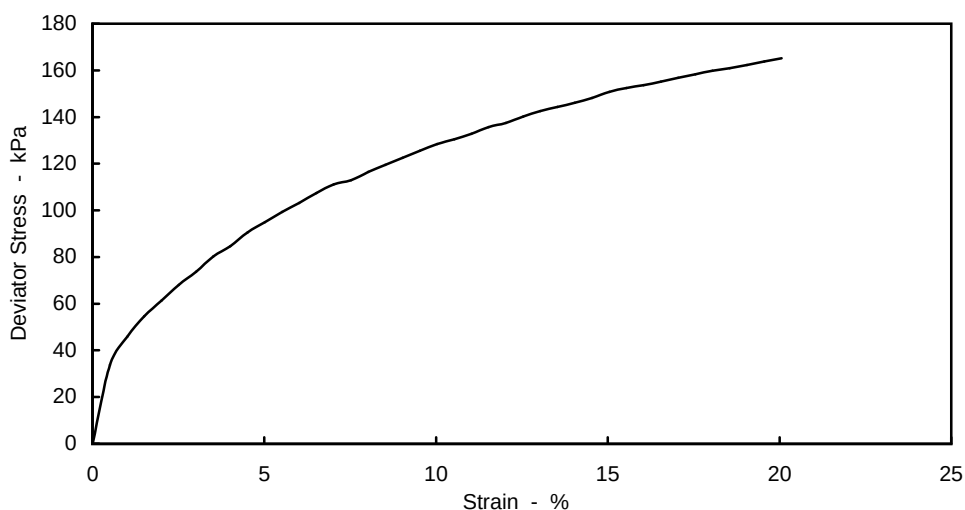
Brown sandy CLAY with some gravel. Gravel is fine to medium.

Comments

Undisturbed specimen taken 100mm below top of tube

Shear Strength Parameters

C	n/a	kPa
Phi	n/a	°



Originator

Checked & Approved

ME

S. Laguerre
03/02/2021**UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION**

BS 1377 : Part 7 : 1990 Clause 8

TTk

Figure 7

Sheet 1 of 2

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site SALE ROAD

Client

Engineer

Contract No **AG3225-21**

Hole BH02

Sample Ref

Depth (m) 4.00-4.45

Sample Type U



Originator

ME

Checked &
ApprovedS. Lagan
03/02/2021

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Tk**Figure 7**

Sheet 2 of 2

Applied Geology Ltd

Unit 23 Abbey Park

Stareton

Kenilworth

Warwickshire

CV8 2LY

For the attention of Hannah Hadwin

Report No: B25530

Issue No 02

LABORATORY TEST REPORT

Project Name	SALE ROAD		
Project Number	B25530	Date samples received	20/01/2021
Your Ref	AG3225-21	Date written instructions received	20/01/2021
Purchase Order	16380	Date testing commenced	20/01/2021
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
1	6	BRE Suites - Soil	Yes
Remarks :			
Issued by : Stephen Langman		Date of Issue : 04/02/2021	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : S. Langman 04/02/2021			
S Langman (Laboratory Coordinator), D Bowen (Production Manager)			
Unless we are notified to the contrary, samples will be disposed after a period of one month from this date. The results reported relate to samples received in the laboratory only. All results contained in this report are provisional unless signed by an approved signatory This report should not be reproduced except in full without the written approval of the laboratory. Under multisite accreditation the testing contained in this report may have been performed at another Terra Tek laboratory. The enclosed results remain the property of Terra Tek Limited and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation. Feedback on the this report may be left via our website www.terratek.co.uk/contact-us			



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 Terra Tek Ltd is registered in Scotland No. 121594
 Offices in Airdrie, Birmingham, Belfast and Aston Clinton

Head Office : 62 Rochsolloch Road, Airdrie, ML6 9BG

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES				Site SALE ROAD																Contract No AG3225-21			
				Client																			
				Engineer																			
Sample Identification				Lab Sample ID	pH	Sulphate (soluble in 2:1 water extract) as SO4 g/l	Sulphate (acid soluble as SO4) %	Total Sulphur %															
Hole	Depth m	Sample Ref	Sample Type																				
BH01	4.00-4.45		U	758704	7.7	0.01	~	~															
BH01	0.40-1.20		B	758705	7.5	0.05	0.06	0.04															
BH01	5.50-5.95		D	758707	8.2	0.02	~	~															
BH02	1.20		D	758708	6.8	0.01	~	~															
TP01	0.50		B	758710	7.2	0.05	0.06	0.03															
TP02	0.50		B	758712	7.6	0.03	0.17	0.11															
Limits of Detection Terra Tek Analysis Method					~ TP019 M	0.01 TP169 M	0.01 TP171 M	0.01 TP129 M															
Accreditation M=Mcerts U=UKAS N=No accreditation																							
Originator		Checked & Approved		BRE SUITE																Tk Figure 1 Sheet 1 of 1			
DAB		S. Langan 04/02/2021																					

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES				Site SALE ROAD					Contract No AG3225-21		
				Client							
				Engineer							
Sample Identification						Temperature on receipt °C	PRIMARY MATRIX	Secondary Matrix	Additional matrix	% Loss at 30C	% Retained 2mm
Exploratory Hole	Depth m	Sample Ref	Sample Type								
BH01	4.00-4.45		U	758704	14/01/21	11.9	CLAY	Fine to medium gravel		12.0	42.9
BH01	0.40-1.20		B	758705	14/01/21	11.9	Silty CLAY	Fine to medium gravel		19.0	9.0
BH01	5.50-5.95		D	758707	14/01/21	11.9	Silty SAND	Fine to medium gravel		13.1	16.2
BH02	1.20		D	758708	14/01/21	11.9	Sandy CLAY	Fine to medium gravel		15.7	10.6
TP01	0.50		B	758710	14/01/21	11.9	Clayey SAND	Fine to medium gravel		13.6	28.0
TP02	0.50		B	758712	14/01/21	11.9	Clayey SAND	Fine to medium gravel		15.6	47.2
Notes Terra Tek are accredited for clay, sand and loam matrix types only, where they constitute the major component of the sample. Other coarse granular materials such as gravel, are not accredited where they comprise the major component of the sample. Results are expressed on a dry-weight basis (samples dried at <30°C) except where stated. Samples for asbestos testing are dried at 85°C. With the exception of samples analysed for asbestos, the laboratory removes any material > 2mm prior to analysis. The quantity and nature of the material is shown as the secondary and additional matrix types in the above table. Where a parameter cannot be determined in house it is our policy to use a UKAS/MCERTS accredited laboratory wherever possible. Terra Tek will assume responsibility for the quality of subcontracted tests and the performance of the subcontractor chosen. Where there is no known UKAS/MCERTS laboratory for a particular parameter, a laboratory listed within the Terra Tek Approved Subcontractors List, which is subject to performance assessment, will be selected.											
Originator	Checked & Approved	SAMPLE DESCRIPTIONS							Appendix S1		
DAB	S. Langman 04/02/2021										
Sheet 1 of 1											

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES				Site SALE ROAD		Contract No AG3225-21						
				Client								
				Engineer								
Sample Identification				Lab Sample ID	Date Sampled	Deviating conditions						Preservatives used
Exploratory Hole	Depth m	Sample Ref	Sample Type			Sampling date has not been provided	Exceeded maximum holding time for selected test(s)	Presence of headspace in sample vial	Poorly fitting cap or lid	Damaged container		
BH01	4.00-4.45		U	758704	14/01/21							
BH01	0.40-1.20		B	758705	14/01/21							
BH01	5.50-5.95		D	758707	14/01/21							
BH02	1.20		D	758708	14/01/21							
TP01	0.50		B	758710	14/01/21							
TP02	0.50		B	758712	14/01/21							
NOTES 1 Results reported for samples classified as deviating may be compromised. Deviation types are shown as "X" or "Yes" in the table above. 2 The absence of "X" or "Yes" in the table above indicates no reported deviations. 3 Deviations due to use of incorrect sample container are shown on result tables. 4 Deviating results are indicated within result tables.												
Originator	Checked & Approved	DEVIATING SAMPLES - SOIL										 Appendix S2
DAB	 04/02/2021											
												Sheet 1 of 1

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site SALE ROAD		Contract No AG3225-21	
		Client			
		Engineer			
Method Code	Reference	Description of Method	ISO17025 Accredited	MCERTS Accredited	Wet/Dry Sample Tested
GP001	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Preparation of soil samples for chemical analysis	Yes	Yes	N/A
GP012	BS EN 12457-3: Characterisation of Waste - Compliance test for leaching of granular waste materials and sludges (two-stage batch test)	Preparation of soil samples for two-stage leachate test			Dry
TP019	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Determination of pH in 2.5:1 water/soil extract using pH meter.	Yes	Yes	Dry
TP032	MAFF Book 427: The Analysis of Agricultural Materials: Method 8	Determination of water soluble boron by ICP-OES	Yes		Dry
TP040	APHA/AWWA, 19th edition: Method 3500Cr-D	Determination of hexavalent chromium by colorimetry.	Yes		Dry
TP041	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Determination of organic matter by titrimetry.	Yes		Dry
TP042	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Determination of loss on ignition at 50-440°C by gravimetry	Yes	Yes	Dry
TP045	GACHAMJA A.M. Chromatography and Analysis: 1992 9-11 (modified)	Determination of polyaromatic hydrocarbons extractable in dichloromethane, by GC/MS	Yes	Yes	Dry
TP046	MEWAM method: Phenols in water and Effluents: 4-aminoantipyrine method	Determination of monohydric phenols by steam distillation/colorimetry	Yes	Yes	Dry
TP047	MEWAM method: Cyanide in Waters etc	Determination of free cyanide by steam distillation/colorimetry	Yes		Dry
TP048	MEWAM method: Cyanide in Waters etc	Determination of total cyanide by steam distillation/colorimetry.	Yes	Yes	Dry
TP049	MEWAM method: Cyanide in Waters etc	Determination of complex cyanide by calculation	Yes		Dry
TP050	MEWAM method: Determination of Thiocyanate ,1985	Determination of thiocyanate by colorimetry	Yes	Yes	Dry
TP051	USEPA Method 9030B	Determination of acid soluble sulphides by steam distillation/colorimetry.	Yes	Yes	Wet
TP067	TNRCC Method 1005: 2001 (modified)	Determination of pentane/acetone extractable petroleum hydrocarbons (C8 - C40) by GC/FID	Yes	Yes	Wet
TP072	In-house documented method	Determination of ammoniacal nitrogen by colorimetry			Dry
TP074	In-house documented method	Determination of water soluble fluoride by ion selective electrode			Dry
TP098	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Determination of acid soluble chloride by titrimetry			Dry
TP099	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Determination of water soluble chloride by titrimetry	Yes	Yes	Dry
TP100	Wisconsin DNR Modified GRO method, Method for Determining Gasoline Range Organics	Determination of Volatile Petroleum Hydrocarbons/GRO.	Yes	Yes	Wet
Notes 1. Terra Tek (Birmingham) are MCERTS accredited for clay, sand & loam matrix types only, where they constitute the major component of the sample. Other coarse granular materials, ie gravel, are not accredited where they comprise the major component of the sample. 2. Results are expressed on a dry-weight basis (samples dried at <30°C) except where stated. 3. With the exception of samples analysed for asbestos, the laboratory removes any material >2mm prior to analysis. The quantity and nature of any material removed from samples is recorded and the information is available on request. 4. The laboratory records the date of analysis of each parameter. This information is available on request. 5. The test results pertain only to the samples provided and is not guaranteed to be representative of the parent material in whole or part from which the sample was taken. Sample location, site address, taken by and client reference are included where provided by the client, Terra Tek accepts no responsibility for the validity or accuracy of this information.					
Originator	Checked & Approved	SUMMARY OF IN-HOUSE ANALYTICAL TEST METHODS (SOIL)		Tk Appendix S3	Sheet 1 of 2
N/A	N/A				

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site SALE ROAD		Contract No AG3225-21	
		Client			
		Engineer			
Method Code	Reference	Description of Method	ISO17025 Accredited	MCERTS Accredited	Wet/Dry Sample Tested
TP110	USEPA Methods 8082A & 3665A	Determination of Total & Speciated 7 PCB Congeners by GC/MS SIM	Yes	Yes	Wet
TP114	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Determination of carbonate in soil (rapid titration method)			Dry
TP126	TNRCC Method 1006 (modified)	Extracted petroleum hydrocarbons from TP067 split into aromatic and aliphatic fractions. Analysed by GC/FID.	Yes		Wet
TP129	In-house documented method	Determination of total sulphur by ICP-OES spectroscopy	Yes	Yes	Dry
TP134	In-house documented method	Determination of water soluble chloride by titrimetry	Yes	Yes	Dry
TP135	USEPA Methods 8100 & 8270D. In-house method TP045	Determination of polyaromatic hydrocarbons extractable in dichloromethane, by GC/MS (with concentration stage)			Dry
TP137	BS7755: Section 3.9: 1995/ISO 11466:1995	Determination of acid extractable metals in soil by ICP-OES	Selected	Selected	Dry
TP145	USEPA Methods 3550C & 8270D	Determination of Semi-Volatile Organic Compounds by GC/MS	Yes	Yes	Wet
TP147	USEPA Methods 8082A & 3665A	Determination of total & speciated WHO 12 PCB Congeners by GC/MS SIM.			Wet
TP150	USEPA Methods 8081B & 8141B	Determination of pesticides and herbicides in soil by GC/MS SIM			Dry
TP152	USEPA Method 556	Determination of carbonyls by GC/MS.			Wet
TP154	USEPA Method 5021. Wisconsin DNR modified GRO method	Determination of volatiles in by GC/MS headspace	Yes	Selected	Wet
TP158	USEPA Method 1671	Determination of glycols by GC/FID DI			Wet
TP169	In-house documented method	Determination of water soluble sulphate in 2:1 water/soil extract by ICP-OES spectroscopy	Yes	Yes	Wet
TP171	In-house documented method	Determination of acid soluble sulphate by ICP-OES spectroscopy	Yes	Yes	Dry
TP174	In-house documented method	Determination of Total Organic Carbon in soils by high temperature combustion & NDIR detection	Yes		Dry
TP178	In-house documented method	Determination of water soluble nitrate by ion selective electrode			Dry
TP181	HSG 248 Asbestos: The Analysts Guide (Appendix 2)	Asbestos Identification in bulk materials	Yes	No	Dry
TP183	HSG 248 Asbestos: The Analysts Guide (Appendix 2) & Standing Committee of Analysts: The Quantification of Asbestos in Soil (2017)	Asbestos Identification & Quantification in soils	Yes	No	Dry
TP185	In-house documented method	Determination of loss on ignition at 150-440°C by gravimetry	No	No	Dry
Notes 1. Terra Tek (Birmingham) are MCERTS accredited for clay, sand & loam matrix types only, where they constitute the major component of the sample. Other coarse granular materials, ie gravel, are not accredited where they comprise the major component of the sample. 2. Results are expressed on a dry-weight basis (samples dried at <30°C) except where stated. 3. With the exception of samples analysed for asbestos, the laboratory removes any material >2mm prior to analysis. The quantity and nature of any material removed from samples is recorded and the information is available on request. 4. The laboratory records the date of analysis of each parameter. This information is available on request. 5. The test results pertain only to the samples provided and is not guaranteed to be representative of the parent material in whole or part from which the sample was taken. Sample location, site address, taken by and client reference are included where provided by the client, Terra Tek accepts no responsibility for the validity or accuracy of this information.					
Originator	Checked & Approved	SUMMARY OF IN-HOUSE ANALYTICAL TEST METHODS (SOIL)		Tk	Appendix S3
N/A	N/A				
Sheet 2 of 2					

APPENDIX F

APPENDIX F

STANDARD FIELDWORK AND ASSESSMENT PROCEDURES

Scope of Work

The scope of work undertaken is defined in Section 1 of the Report. It should be noted that Applied Geology Limited does not provide arboricultural surveys, specialist surveys for the detection of invasive plant species (such as Japanese Knotweed) or protected species of wildlife. Information from environmental and ecological datasets is included from a review of the MAGIC (Multi-Agency Geographic Information for the Countryside) website, however, if a full assessment of Environmental or Ecological aspects is required, it is recommended that other specialists are consulted. Similarly, information on flood risk is included; obtained from the Environment Agency Web site and the GroundSure report; but this is not intended to be a full hydrological study and, if a flood risk assessment is needed, additional analysis by others is recommended to confirm this aspect of the development. Also, whilst our field staff have undergone asbestos awareness training, Applied Geology does not undertake asbestos surveys or provide specific advice relating to asbestos-containing materials. Any suspected asbestos-containing materials observed by our field staff will be mentioned in the report but further assessment by others may be required.

Fieldwork

Fieldwork is generally carried out in accordance with BS5930 (2015) "Code of Practice for Site Investigations" and BS10175 (2011) Investigation of Potentially Contaminated Sites, unless otherwise stated.

Prior to commencement on site, statutory services plans are generally obtained and verbal enquiries are also made regarding the positions of private or statutory services on site. Prior to excavation or drilling, locations are scanned with a cable avoidance tool (CAT) and service pits are generally excavated at borehole positions, where possible.

Descriptions and depths of the various strata recovered are presented on the exploratory hole records, reproduced in the report appendices, together with sample depths, the results of in-situ testing, comments on groundwater inflows, and any other pertinent information. The strata descriptions are in general accordance with BS5930:2015. Disturbed plastic pot and glass amber jar samples are recovered from the various strata and stored and transported in cool boxes, where relevant, for possible future laboratory testing.

Light cable percussion boreholes are generally drilled using a Pilcon Wayfarer or Dando rig and are advanced using equipment to bore 200/150mm diameter boreholes. Disturbed plastic pot samples are recovered from all deposits encountered to allow examination and laboratory testing. Certain strata are cased off due to their tendency to collapse, particularly in the presence of groundwater inflows and/or to reduce the risk of cross contamination. In situ Standard Penetration Tests, using Split Spoon (SPT) and Cone (CPT) are undertaken in the boreholes to provide a measure of the relative density of the granular (coarse grained) deposits or shear strength of the clay/chalk/ weathered rock deposits using industry recognised correlation guidelines of shear strength against SPT "N" value results. Within the fine grained (cohesive) deposits, "undisturbed" 100mm driven open tube samples were recovered from the various deposits to provide samples for examination and laboratory testing. On encountering groundwater, boring is usually suspended for 20 minutes while any rise in water level is recorded. Full details of the groundwater observations and monitoring results during boring operations are included on the borehole records. All boreholes without monitoring wells installed are usually backfilled with arisings upon completion, unless otherwise stated on the individual logs.

Unless otherwise stated on the relevant logs, trial pits are excavated using a wheeled backhoe excavator, usually with a 0.6m wide bucket. The excavations are logged from the ground surface by an Engineering Geologist / Geo-environmental Engineer and relevant field testing, appropriate to the soils encountered, is carried out on samples brought to the surface. Representative disturbed soil

samples are collected from selected horizons for subsequent laboratory testing. The trial pits are usually unshored and where reasonable, left open for a period of time to allow observations of pit stability and depth and inflow rate of any groundwater ingress. The excavations are backfilled with arisings prior to moving on to the next position. Any trial pits carried out as part of this or previous investigations may represent soft spots and conduits/sumps for groundwater or surface water. In excavations, such materials may also be loose and unstable.

Driven Continuous Sampling (DCS) boreholes are drilled using a track mounted Global mini-rig or similar using sampling tubes of varying diameter (decreasing with depth). Samples of the deposits encountered are recovered in 1m long clear plastic liners, which are logged and sub-sampled on site by an Engineering Geologist. Generally for geotechnical investigations, during the drilling process in-situ Standard Penetration Tests (SPTs) are undertaken at selected depths to provide a measure of the relative density of the granular (coarse grained) deposits or shear strength of the clay/chalk/ weathered rock deposits using industry recognised correlation guidelines of shear strength against SPT "N" value results. Groundwater seepages are noted during drilling if encountered. All boreholes without monitoring wells installed are usually backfilled with arisings upon completion.

Unless specifically stated in the report, exploratory hole locations should be regarded as approximate. Consideration should be given to accurate location of the exploratory holes where it is considered they may impact on proposed development.

It should be noted that groundwater levels at any particular site may fluctuate due to rainfall, seasonal variations etc and, therefore, levels may be different to those measured during the course of the fieldwork and monitoring period.

Laboratory Testing

The geotechnical testing was carried out in accordance with BS 1377:1990 Method of Tests for Soils for Civil Engineering Purposes and was undertaken by a UKAS accredited specialist laboratory. Chemical testing was undertaken by a UKAS accredited specialist chemical testing laboratory and MCERTS accredited methods, in accordance with Environment Agency recommendations, were specified where available.

Contamination Assessment – Human Health

Applied Geology Limited has followed the guidance given in the CLR 11 publication and other available guidance to assess the contaminant concentrations. Details of the methodology followed are briefly outlined below.

The available chemical data is sorted into appropriate datasets depending on sampling regime and ground conditions. An initial generic quantitative risk assessment is undertaken on this data using statistical tests, where appropriate, and relevant screening values. Risk to human health has been initially assessed by comparing soil results against various published screening criteria. These have been sourced from the following, in order of preference:

- DEFRA. Category 4 Screening Levels (C4SL), March 2014;
- LQM/CIEH S4UL for Human Health Risk Assessment (S4UL), 2015*;
- Environment Agency/DEFRA, Soil Guideline Values (SGV) published in 2009;
- EIC/AGS/CL:AIRE Soil Generic Assessment Criteria (GAC), 2010.

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Except for lead and benzo(a)pyrene, the assessments will be carried out by comparing results against the LQM/CIEH S4UL in the first instance, where these values are exceeded, then reference will be made to the C4SLs where such exist. Lead will only be compared to the C4SL because no S4UL exists for lead. For Benzo(a)pyrene, Applied Geology has chosen to adopt the approach presented by the C4SL committee rather than the approach proposed by LQM/CIEH. Further discussion on this is presented below.

It is our view, and the view of others in the industry, that the C4SL were derived for use in both the Part IIA system and through the planning system, as they allow identification of those sites that fall within Category 4 (not contaminated) and are therefore able to be developed with no further remedial action. The C4SLs are considered to represent a contamination level that is 'low' from a toxicological view point, which we therefore consider to be 'acceptable' under planning.

Historically, the level of contamination has been assessed with reference to SGV values which were derived to represent a 'minimal' level of contamination. The SGVs are still valid and can be used alongside C4SL, however both screening values are only intended to provide guidance as to the level of contamination and, where concentrations fall below these screening values, the site is not contaminated (and is within Category 4). Exceedance of a SGV/S4UL/C4SL does not automatically indicate that an 'unacceptable' risk exists at a site; simply that further consideration of that particular contaminant is required.

At this time, there are two toxicological methodologies that can be used in the derivation of screening criteria for PAHs; Relative Potency Factor (RPFs) or the Surrogate Marker approach. Applied Geology has chosen (based on the latest guidance from the Health Protection Agency (HPA) to use the surrogate marker approach proposed in the C4SL methodology, whereby benzo(a)pyrene can be used as a surrogate marker for all 'genotoxic' (gene damaging) PAHs. The surrogate marker approach estimates the toxicity of a mixture of PAHs in an environmental matrix by using data from toxicity studies in which a PAH mixture of known composition was tested. Exposure to the surrogate marker benzo(a)pyrene is assumed to represent exposure to all the PAHs in the environmental matrix. Thus, the level of toxicity ascribed to the surrogate represents the toxicity of the PAH mixture. This allows an assessment of the combined carcinogenic risk associated with genotoxic PAHs using only benzo(a)pyrene. In order to confirm that the mixture of genotoxic PAH in the soil is similar to the coal tar mixture used in the toxicological study, various PAH ratios are plotted and checked to see that they fall within the limits set in HPA, 2010.

Contamination Assessment – Water Quality

Risks to water quality has been assessed by following the Environment Agency guidance on groundwater protection (previously known as GP3), updated on their website in March 2017, see <https://www.gov.uk/government/policies/water-quality> and 'The Environment Agency's approach to groundwater protection' (March 2017 Version 1.0).

For hazardous substances, which should be prevented from entering groundwater, the screening criteria are initially set as the limit of detection, however, if groundwater has already been impacted, an appropriate environmental standard will then be used. For hazardous substances, background quality may also be taken into account.

For non-hazardous compounds, their release should not result in any pollution or significant risk of pollution in the future, as such comparison with UK DWS or EQS standards will allow determination of whether pollution could occur. Typically screening criteria will be sourced from the following:

- Environmental Standards (ES), which are defined in European legislation such as the Water Framework Directive (WFD) (2000/60/EC) and the Priority Substances Directive (PSD) (2008/105/EC) a daughter directive of the WFD.
- The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Direction, 2010.
- UK Water Supply (Water Quality) Regulations, 2010.
- UK quality standards for water to be used for direct abstraction to potable supply e.g. Surface Water (Abstraction for Drinking Water) (Classification) Regulations, 1996.
- World Health Organisation (WHO) Guidelines for Drinking Water Quality.

Re-use of Soils and Waste Soil Disposal

It is noted that if any excavated material is to be reused on site, a Waste Management Plan (WMP) and / or a Materials Management Plan (MMP) will probably be required. Any such materials must be suitable for re-use without further treatment, and only the quantity necessary for the specified works should be used. Any materials not within these definitions may need to be considered as waste whereby a Waste Management Licence Exemption may also be required.

A specific categorisation and assessment of potential waste soils arising from the proposed development has not been undertaken as part of the investigation, unless otherwise detailed in the report text. However, generic comments and advice are made below for the reader.

All waste soils should be sorted to prevent mixtures of waste types. Where possible, any waste soil should be recycled and the volume of soil to be disposed of should be minimised. Any excavated soil material and excess spoil disposed of off-site should be treated as Waste and classified as Inert, Non-hazardous or Hazardous, prior to removal from site, as required by the "Duty of Care" (Environmental Protection Act, 1990) legislation together with Annex II of Directive 1999/31/EC ("Landfill Directive"). Initially, Basic Characterisation of the waste is required whereby the material should be described and its source of origin recorded (a site plan, exploratory hole records and the certificates of chemical analysis in this report should be included). This should also include data on its composition and leaching behaviour, its European Waste Catalogue (EWC) code, and where relevant any hazardous properties according to Annex III of Directive 91/689/EEC. This information should be provided to the licensed waste contractor.

Soils excavated on many sites would generally fall under the EWC description "Soil and Stones", EWC code 17 05 04. Waste Acceptance Criteria (WAC) testing is required for many Inert wastes and generally for all Hazardous Waste but not for non-hazardous waste. There are certain restrictions for inert wastes regarding topsoil and peat. Any asbestos must be disposed of by suitably licensed contractors to a suitably licensed facility.

Health & Safety Aspects

As outlined within the HSE publication 'Successful Health and Safety Management - HSG65', this report should inform your development of safe systems of work and information as an input into the safety management system.

When developing risk control systems we suggest making reference to the CIRIA report 132 "A guide for safe working on contaminated sites" and the HSE document "Protection of workers and the general public during the development of contaminated land – HSG66". All risk control measures should be in accordance with the guidelines laid down within the Management of Health and Safety at Work Regulations 1999.

The contents of this report may be used to supplement the contents of the Health and Safety File as required under the Construction Design and Management (CDM) Regulations.

Where excavations are undertaken on site, trench support or the angle of batter should be designed by an appropriately qualified engineer or competent person to suit the required depth and the ground and groundwater conditions. Care should be taken when digging excavations to prevent undermining or causing loss of support to the foundations of the nearby adjoining structures. Surcharging such as from spoil or vehicle movements close to excavation sides should be avoided. Practical guidance on trench excavation is given in CIRIA Report 97 Trenching Practice. Guidance on groundwater control is given in CIRIA Report 113 Control of groundwater for temporary works. Temporary works should be designed by a suitably qualified engineer or a competent person particularly where personnel access is necessary, in accordance with the requirements of the Construction (Design and Management) (CDM) Regulations.