Report Title:

Phase 1 Geo-Environmental Desk Study

Project Name:

Delamere Road, Hayes

Report Reference: **BRD4241-OR1-A**

Date: **April 2023**

BRD Environmental Ltd

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REPORT CONTROL SHEET

REPORT TITLE	**PHASE 1 GEO-ENVIRONMENTAL DESK STUDY**
PROJECT	**DELAMERE ROAD, HAYES**
CLIENT	**ROSEBAND DEVELOPMENTS LTD**

REPORT REFERENCE	ISSUE DETAIL	DATE	PREPARED BY	CHECKED BY
BRD4241-OR1-A	First Issue	14/04/2023	I Hibberd	J Brockwell

BRD Environmental Limited

Geotechnical and Environmental Services

- Ground Investigation
- Japanese Knotweed Removal
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- Contamination Assessment
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REPORT LAYOUT

This report is divided into the following four sections: Summary Report, Technical Report, Supporting Information and Appendices.

SUMMARY REPORT

This expanded executive summary provides the main findings of the work undertaken in brief non-technical language. This section provides an overview of the key outcomes for the benefit of non-specialists and concludes with the main recommendations. This section should only be relied upon in the context of the whole report and the Technical Report should be referred to with respect to any design decisions.

TECHNICAL REPORT

The main report section is intended to provide the technical detail of the investigation and is intended to provide the level of information required by current guidance documents and practice. The Technical Report is written in a language that, in part, assumes knowledge of subject matter so that it can be written in as concise a form as possible. Its intended audience is peers, regulators and other professionals in related disciplines.

SUPPORTING INFORMATION

This section of the report provides background details of a generic nature together with specific technical approaches adopted by BRD and details of the guidance documents that are commonly referenced in the report. The section also includes explanations of technical terms to assist non-specialist readers in understanding the Technical Report. It should be noted that not all the information within this section is necessarily applicable to this specific report.

APPENDICES

The final section of the report presents the factual data collected and employed as part of the investigation.

APPENDIX 1 SITE PLANS & PHOTOGRAPHS

Site Location Plan	Ref. BRD4241-OP1-A
Site Walkover Photographs	Ref. BRD4241-OP2-A
Initial Conceptual Site Model	Ref. BRD4241-OP3-A
Proposed Development Plan	'Proposed Site Plan' Coventry Design Limited, Drg No. 013442, Dated Sept 2022

APPENDIX 2 HISTORICAL PLANS

Order No. 308411552_1_1	40 x A3 pages

APPENDIX 3 ENVIROCHECK REPORT

Order No. 308411552_1_1	96 x A4 pages & 17 x A3 pages

APPENDIX 4 PRELIMINARY UXO ASSESSMENT

Zetica Preliminary UXO Assessment	1 x A4 page

SUMMARY REPORT

SUBJECT	COMMENTS
CURRENT SITE CONDITION	The site forms a section of land approximately 0.18 hectares in size that is located behind some existing residential properties. The site is used entirely for storage of old fridges and fridge parts, dating back several decades and there are large stockpiles across it. The site is currently in the process of being cleared of some materials by the owner.
PROPOSED DEVELOPMENT	It is proposed that the site will be developed with an apartment block of 8No. flats surrounded by communal landscaping and also one separate house with a private garden. A new access road and car parking area will also be constructed.
HISTORICAL SUMMARY	The site has remained undeveloped throughout the mapped history, however, has still be subject to some changes. Prior to 1960, the original course of the Yeading Brook flowed along the south eastern boundary of the site, with the new cut course of the brook along the western boundary. By 1960, the original course had either been culverted or backfilled. A crossing point over the newer brook was removed at this time, with access via the new access road to the east. The site has been owned by the current owners family since the 1930s when the surrounding houses were built. The site was originally the builder's yard for the estate, but after was then used for storage of fridges and spare parts by a fridge repair company, resulting in vast stockpiles across the site that have remained to present day.
PUBLISHED GEOLOGY	The site is shown to be underlain by superficial deposits of the Langley Silt Member. However, some alluvium may be present associated with the former course of the Yeading Brook along the south eastern boundary. The shallowest bedrock unit is shown to be the London Clay Formation.
RADON GAS	Radon gas protection measures are not required.
HYDROGEOLOGY	The Langley Silt Member is designated as Unproductive Strata, however, the underlying River Terrace Deposits in the area are designated as a Principal Aquifer. The deeper London Clay Formation is also designated as Unproductive Strata.
HYDROLOGY	The closest water feature to the site is the Yeading Brook which runs parallel the western boundary of the site meeting the Grand Union Canal 1km south to the site. The canal itself is approximately 150m to the south east of the site at its closest point. The site is in an area indicated to be at risk of flooding.
PREVIOUS GROUND REPORTS	BRD is not aware of any previous ground investigations having been conducted at the site.

PRELIMINARY CONTAMINATION RISK ASSESSMENT	
Whilst they are unlikely to have resulted in significant contamination, the storage on site of vast quantities of fridges / scrap metal over a number of years could have led to some contamination of the surface soils from leaks and spills of coolants and oils. Unsuitable materials, such as insultation foam and ash, could also be present in the underlying soils. The former use as a builders yard could also have introduced other materials such as asbestos. A potential risk albeit low has also been identified from the migration of soil gasses being generated from the historic worked ground within the wider area surrounding the site.	
PRELIMINARY GEOTECHNICAL ASSESSMENT	
Whilst the soils of the Langley Silt Member would usually be suitable for conventional spread foundations, it is considered that piled foundations will likely be required for the proposed new buildings due to shallow groundwater, the proximity of the Yeading Brook, the trees around the site and the potential for variable soils. The anticipated clayey ground conditions combined with likely shallow groundwater would suggest that soakaways for surface water drainage are unlikely to be suitable.	
RECOMMENDATIONS	
PHASE 2 CONTAMINATION ASSESSMENT	This Phase 1 desk study assessment has identified the potential for some contamination on the site arising from the stockpiled fridges and scrap metal on the site, largely arising from potential leakages of chemical and incorporation of materials into the surface soils. Accordingly, some Phase 2 contamination assessment is necessary to assess the significance of this contamination and whether it poses any risk to the proposed development. However, it is not considered that this Phase 1 assessment has identified any significant contamination risks on the site that would preclude any redevelopment and therefore no reason why the subsequent Phase 2 contamination assessment could not be addressed through appropriately worded conditions on a future planning permission for the proposed development.
GEOTECHNICAL GROUND INVESTIGATION	For any form of development, BRD recommend that an intrusive ground investigation is undertaken in order to confirm ground conditions and allow design of the new structures. Such an investigation could easily be incorporated into the Phase 2 contamination assessment that is recommended for the site.

1. INTRODUCTION TO TECHNICAL REPORT

1.1. CONTRACT DETAILS

CLIENT	Roseband Developments Ltd.
SITE	Land situated at the rear of 12-26 Delamere Road, Hayes.
CLIENT'S ADVISORS	BRD Environmental Limited (BRD) has been commissioned by planning consultants Woolf Bond Planning on behalf of the Client.
REPORT CONTEXT	It is understood that the Client intends to purchase the site and develop it for residential housing.
REPORT TYPE	Factual and interpretative geo-environmental desk study.
REPORT OBJECTIVES	The site was previously refused planning by the London Borough Council of Hillingdon as no assessment in relation to contaminated land issues was completed prior to the application being submitted. The purpose of the report is to undertake a Phase 1 contamination assessment of the site in support of a planning application for the proposed development.

1.2. SCOPE OF WORKS

The agreed scope of works was:

- Desk based research through the purchase of an Envirocheck report, including:
    - Environmental database search.
    - Environment Agency data.
    - BGS radon maps.
    - Available historical Ordnance Survey plans.
- Interpretation of the geological, hydrogeological and hydrology setting of the site from published sources.
- Enquiries to local contaminated land officer and to the Environment Agency, as required, to see if obtain any pertinent information on the site.
- Undertake a preliminary UXO risk assessment in line with CIRIA 681 "Unexploded ordnance (UXO) A guide for the construction industry".
- A site walkover will be undertaken by a Geo-Environmental Consultant to identify any potential sources of contamination or indication of other ground related hazards at the site and its surroundings.
- Prepare a Phase 1 desk study report including copies of the purchased information, interpretation of the collected data to identify and assess contamination hazards together with any other environmental issues.

1.3. REPORT LIMITATIONS

Any site boundary lines depicted on plans included within this report are approximate only and do not imply legal ownership of land. Any observations of tree species, asbestos containing materials within structures or invasive weeds, does not constitute a formal survey of such features. The identification of such features is therefore tentative only. In the case of Japanese Knotweed, BRD can undertake separate surveys for this plant undertaken by a Property Care Association qualified surveyor.

The report does not consider whether sensitive ecology or archaeology is present as these require consideration by professionals specialising in these matters. It should be recognised that the collection of desk study information may not be exhaustive and that other information pertinent to the site may be available.

It is emphasised that a desk study and walkover can only indicate the potential for contamination on the site. This study aims to highlight potential pollutant linkages in line with current guidance. The plausibility of these linkages can only be proved by an intrusive ground investigation.

It should be noted that a desk study and walkover can only reveal the potential for certain types of ground conditions and geotechnical hazards. For any form development an intrusive ground investigation is recommended. The scope of this investigation excludes a formal slope stability study and any observations made regarding slopes are for information only.

2. SITE CHARACTERISTICS

2.1. SITE SETTING

SITE ADDRESS AND POST CODE	Rear of 12-26 Delamere Road, Hayes, London, UB4 0NL.
NATIONAL GRID REFERENCE	511745E, 180890N.

2.2. SITE DESCRIPTION

INSPECTION DATE	21st March 2023.
CURRENT USE	The site forms a section of land behind some houses and is currently used entirely for storage of old fridges and fridge parts, which are present as a massive stockpile across the site. The site is currently in the process of being cleared of materials and a pathway has been cleared through the middle of the site between the stockpiles of old fridges and metallic waste.
AREA	Approximately 0.18 hectares.
SHAPE	The main body of the site is triangular. The existing / proposed access road section then extends to the north east towards Delamere Road.
ACCESS	The access road is directly off Delamere Road. At present the site can be accessed on foot via a small gate at the end of the access drive at the north eastern corner.
BOUNDARIES	The boundaries of the storage area are all formed by secure metal fencing, albeit that the western boundary adjacent to Yeading Brook could not be inspected. From Camden Avenue to the west of the site beyond the river, it was evident that the far river bank adjacent to the site consisted of a sheet piled wall, but the site itself could not be seen from this location. The northern boundary is formed by the various garages to the north associated with the adjacent Berwick Avenue.
TOPOGRAPHY	The site is relatively flat.
SURFACING	The exposed surfacing under the stockpiled fridges / fridge parts / metal waste in the main site area all appears to be soft cover. The access road is covered in tarmac at the eastern end, concrete in the central section the gravel at the far end at the west.
BUILDINGS	No buildings are present on those sections of the site that could be inspected.
VEGETATION	Several trees had been recently cleared which were presumably growing though the stored material. Several semi-mature deciduous trees were still observed to be growing through the stockpiled materials in the southern section of the site. It was also evident that a large amount of ivy and brambles had been cleared.

NOTABLE FEATURES AND OBSERVATIONS	The waste material stockpiled at the site predominantly appeared to comprise old fridges, both domestic and commercial, and parts associated with these. In particular in the western part of the site were old stockpiles of metal condenser elements, presumably from refrigeration units. There were also various plastic, wire and copper pipes associated with this. Other items included gas canisters, occasional old empty metal barrels and stainless steel basins and kitchen units. Where the path had been cleared through the stockpiles, it was evident that these sections of the site were underlain by soft cover. In the north western corner near the access the soils appeared to contain abundant burnt and metallic material. Towards the south eastern section there was dense vegetation debris and beneath this, a flinty Made Ground soil was encountered in one location and an ashy soil was encountered in another. As discussed below in the Site History section, the original course of the Yeading Brook ran alongside the south eastern boundary. This was then either culverted/piped or backfilled in the 1950s. Whilst there is no evidence of this former watercourse next to the site, there is a gap between the houses on the opposite side of Delamere Road along the line of this former stream.

SURROUNDING LAND USE	The site is set in a residential area.
TO THE NORTH	To the north are residential properties with associated domestic garages bordering the north west corner of the site.
TO THE EAST	To the east are residential properties.
TO THE SOUTH	To the south are residential properties and to the south west, the site is bordered by more domestic garages associated with these properties. Further to the south east, the Grand Union Canal is approximately 170m from the site boundary.
TO THE WEST	Adjacent to the western boundary is Yeading Brook, beyond which are residential properties.

2.3. SITE HISTORY

MAPPED HISTORY		
DATE RANGE	**SITE**	**SURROUNDING AREA**
1868 to 1920	The first available map edition from 1868 shows the site as being part of a field. Along the northern boundary of the site is a track which leads from Hayes Gate Farm approximately 150m to the south west of the site	The first available map edition from 1868 shows the site to be surrounded by fields with the following additional features of note: • Yeading Brook is adjacent to the western site boundary as a straight cutting, suggesting this section is a

MAPPED HISTORY		
DATE RANGE	**SITE**	**SURROUNDING AREA**
	A stream / ditch is shown to be present along the south eastern site boundary.	manmade channel. A crossing over the brook is present in to the north western corner of the site. • The stream / ditch along the south eastern boundary of the site extends parallel to the canal before looping back to the Yeading Brook. It would appear that this section of the brook was the original course of the Yeading Brook, before the manmade channel cut off the corner. • The Paddington Branch of the Grand Union Canal is approximately 150m to the south east of the site. There is a connecting drainage channel between Yeading Brook and the canal around 50m to the south of the site. • Hayes Gate Farm is approximately 150m to the south west, with a pond shown around 100m from the site. • A large brick field (pit) approximately 250m to the south east. By 1880 a large brick works is also shown approximately 500m to the east of the site. The map edition from 1914 shows the brick works to the east to have expanded right up to the east of the canal, around 160m from the site. Beyond this mass residential development has occurred. To the south, the channel to the canal is shown to cross Yeading Brook as an 'aqueduct'. By the 1920 map edition, a further large brick works is now shown to the approximately 400m to the south west of the site.

MAPPED HISTORY		
DATE RANGE	**SITE**	**SURROUNDING AREA**
1935 to 1948	The map edition from 1935 shows the majority of the site to be an undeveloped parcel of land. The northern boundary of the site appears to have been redeveloped as an access road to the rear gardens of neighbouring properties, with the crossing across Yeading Brook still evident. The stream / channel along the south east boundary is confirmed to be outside the site by these map editions.	The map edition from 1935 shows the site to now be surrounded by residential houses which extend some 250m to the north and west of the site. To the east a concrete works is shown approximately 400m from the site boundary. The brick works to the east is now shown as Allotment Gardens. Approximately 250m to the south of the site a tyre factory is shown, as well as the brick works to the south west that still remains. The map edition from 1938 shows the construction of a number of large commercial / industrial units approximately 75m to the south east of the site next to the canal. These are labelled as a depot from the 1960 map edition.
1960 - 2022	The 1960 map edition still shows the site as being undeveloped, however, the crossing over the Yeading Brook and the access track from that are no longer apparent. The 1999 aerial image shows the site to be surrounded by trees and covered by the storage of waste materials.	The 1960 map edition shows the immediate site surroundings to remain unchanged. The drainage channel loop of the Yeading Brook that extended past the south eastern boundary of the site and parallel to the Grand Union Canal would appear to have been infilled or culverted as development is apparent over the line of the ditch. The brick works to the south west is now shown as a works. A number of other factories have now been constructed approximately 250m to the south / south west of the site. The concrete works to the east is now shown as a works and has expanded to approximately 250m from the site boundary. By the 1999 map edition this works has been redeveloped as residential properties. The 1973 map shows the depot to the east to be reconfigured with larger works buildings. The 1999 aerial image shows this area to have been redeveloped with residential properties.

AERIAL IMAGERY	The aerial images from 1999 to 2022 shows the site to be covered by stockpiles of waste materials and surrounded by trees. There are trees shown within the stockpiled material from the 1999 image onwards suggesting that the waste may have been present for many years beforehand.
INTERNET SEARCH	Internet research of the local area revealed the following document: • 'Exceeding good brick-earth - The Victorian Brickfields of Northolt' Some pertinent points from this document as summarised below. The superficial soils across the Yeading and Northolt areas were known as 'brickearth' and were extensively worked for brick making. The clay materials were excavated from shallow opencast excavations. Brick making increased rapidly during the end of the 18th Century to meet the demands of the expansion of London at that time. The brickworks were typically located in close proximity to the Paddington Arm of the Grand Union Canal as the canal was the preferred method to transport the bricks. The Paddington Arm of the Grand Union Canal opened in 1801.
ANECDOTAL	The current owner stated that the site has been owned by his family since the 1930s when the surrounding houses were built. This spare plot of land was originally the builder's yard for the estate. Following this, the site has been used for storage by a fridge repair company and the owner says this is how all the fridge parts have become built up over the years. Old fridges were stored on site for spare parts and eventually the amount of became excessive with the entire site consisting of piles of fridges and parts. The current owner is in the process of slowly clearing the site of the stockpiled materials. He says he has had dealings with the EA regarding waste management issues, but his opinion is that the material stored on site is his own property and not waste.
PRELIMINARY UXO RISK ASSESSMENT	BRD instructed Zetica Ltd to undertake a Preliminary UXO Risk Assessment for the site. The preliminary assessment did not identify any significant source of military activity or increased potential UXO on the site. It has determined that the UXO risk is low at this site and that a detailed desk study is not required. The Zetica Preliminary UXO Risk Assessment is included in Appendix 4.

2.4. GEOLOGY

GEOLOGICAL CONTEXT	The site lies in an area of Quaternary superficial deposits, mainly of fluvial and windblown origin. These were mainly deposited as River Terrace Deposits from the post-diversionary River Thames. This overlies bedrock of Eocene clay of deep marine origin. These superficial deposits known as brickearth were extensively worked via shallow opencast excavations in the local area for brick making.

SUPERFICIAL DEPOSITS	The site is shown to be underlain by the superficial deposits of the Langley Silt Member which are part of the Maidenhead Formation and was formerly mapped as 'brickearth'. It is described as 'very fine-grained sand, silt, and clayey silt, which is brown to orange-brown in colour'. The Langley Silt deposits are generally less than 3m thick. Underlying the Langley Silt Member it is anticipated that River Terrace Deposits containing sands and gravels are likely to be encountered. Whilst not shown on the geological mapping, there is also the potential for alluvial / fluvial soils to be present from the former stream that ran along the south eastern boundary of the site and off parallel to the Grand Union Canal. This would appear to have been the original course of the Yeading Brook before the culverted section was created running along the western site boundary and extending to the north, cutting off the original stream loop.
BEDROCK GEOLOGY	The underlying bedrock geology is shown to comprise the London Clay Formation, which is described as blue-grey to grey-brown, calcareous, silty to very silty clay or clayey silt, with occasional bioturbation and laminations. It may also contain thin carbonate concretions and disseminated pyrite.
BGS BOREHOLE RECORDS	Three BGS boreholes records are located approximately 180m to the south of the site, which revealed the following geological strata. <u>TQ18SW152</u> Made Ground - Concrete and ash to 0.5m bgl Superficial clay soils – Peat and gravel over soft brown clay to 1.2m bgl. Superficial sand and gravel to 4.2m bgl. Groundwater at 1.0m bgl <u>TQ18SW153</u> Made Ground – Concrete 0.2m bgl. Superficial grey peat to 0.8m bgl. Superficial sands and gravels to 4.2m bgl London Clay to >9.1m bgl. Groundwater at 0.8m bgl. <u>TQ18SW154</u> Made Ground - Concrete and ash to 1.15m bgl Superficial sand and gravel to 4.4m bgl. London Clay to > 4.7m bgl. Groundwater was not encountered in this borehole.
GROUND STABILITY HAZARDS	No significant ground stability hazards have been identified by the Envirocheck report.
SOIL GEOCHEMISTRY	The site is situated in an area where the natural background concentrations of Lead are elevated, most likely as a consequence of urban atmospheric fallout.

2.5. RADON

The site is not situated within an area where radon gas protection measures are required in new buildings.

2.6. HYDROGEOLOGY

SUPERFICIAL AQUIFER	The Langley Silt Member is designated as Unproductive Strata. The River Terrace Deposits in the area are designated as a Principal Aquifer.
BEDROCK AQUIFER	The London Clay Formation is designated as Unproductive Strata.
LICENSED GROUNDWATER ABSTRACTIONS	None within 250m from the site.
GROUNDWATER SOURCE PROTECTION ZONE (SPZ)	Not located within a SPZ.

2.7. HYDROLOGY

SITE DRAINAGE CHARACTERISTICS	The majority of the site is covered by soft soils overlain by scrap metal. Rainwater and surface water will largely infiltrate into the surface soils in this area of the site, although surface run off in to the surrounding areas would also be expected. Along the tarmac access road surface water will run off onto the site or into the drainage system for the neighbouring residential properties. No gullies along the access road were observed during the walkover.
SURFACE WATER FEATURES	The closest surface water feature to the site is Yeading Brook running adjacent to the western site boundary. This flows in a southerly direction. Approximately 170m to the east of the site is the Paddington Branch of the Grand Union Canal. The nearest river is the River Crane approximately 3.6km to the south west of the site.
SURFACE WATER ABSTRACTIONS	None within 250m from the site.
DISCHARGE CONSENTS	None relevant to consideration of the site.
FLOODING	The site is located in a Zone 2 area and may be affected by extreme levels of flooding. Additionally, the site is in an area of low risk of flooding from surface water.

2.8. ENVIRONMENTAL ASPECTS

LANDFILL	There are a number of recorded landfills in the wider area, but none within 250m of the site. The nearest recorded landfill is approximately 450m to the south west of the site in the location of the former brick works.
WORKED / INFILLED GROUND	Extensive areas of worked ground and infilled ground are identified in the Envirocheck report to the east, south and south west of the site, all associated with the former brickworks in the area. The nearest worked ground shown is approximately 200m to the south east of the site. This entry relates to the BGS recorded mineral site associated with "Uxbridge Road, Brickworks" which employed historic opencast extraction of the near surface Langley Silt Member.
POTENTIALLY INFILLED PONDS / DITCHES	The Envirocheck report identifies a potentially infilled drainage ditch approximately 40m to the south west of the site, which relates to the drainage channel connecting the Yeading Brook to the Grand Union Canal. A potentially infilled pond is also identified approximately 96m to the west of the site, which correlates to the pond within the former Hayes Gate Farm farmyard.
CONTEMPORARY TRADE DIRECTORY ENTRIES	There are no contemporary trade entries in the immediate vicinity of the site relevant to this contamination assessment.
REGISTERED HAZARDOUS SITES	None within 250m of the site.
POLLUTION INCIDENTS TO CONTROLLED WATERS	There have been no recorded pollution incidents within 250m of the site.
SUBSTANTIATED POLLUTION INCIDENT REGISTER	In 2003 a "Category 1 Major Incident" was recorded for the site itself in relation to Land Impact, albeit from inert pollutants. In terms of the impact to air and water the identified pollution was a "Category 4 – No Impact" incident and therefore is unlikely to have resulted in any significant contamination to these receptors. No further information regarding this pollution incident is provided in the Envirocheck report other than the incident reference being 163848. As discussed in the next section, this incident is connected to the EA raising waste management issues in connection with the stockpiled scrap metal / waste rather than any actual pollution incident.
ECOLOGICALLY SENSITIVE LAND USE	None identified within 250m.

2.9. ENQUIRIES TO REGULATORY AUTHORITIES

2.9.1. Environmental Services at London Borough Council of Hillingdon

An enquiry was made to the local council to establish if they had any records of contaminated land entries, pollution incidents or environmental nuisances at the site. They responded to say that they did not have any records relating to the site.

2.9.2. Environment Agency

An enquiry was also made to the EA to establish what records they have for the site, in addition to enquiring about the pollution incident register for the site.

The following information was received:

- There are no records of site investigations or remediation works on the site or in the immediate area.
- The site is not designated as a Special Site under Part IIa of the EPA 1990.
- There are no records of permits being allocated to the site.

The EA also provided some limited information on the Substantiated Pollution Incident identified in the Envirocheck report. The incident related to an unauthorised waste management activity associated with inert materials and waste, namely the storage of waste fridges / scrap metal on the site.

As discussed above, during the site walkover the current owner's opinion on this is that the material stored on site is his own property and therefore not waste. Although this aspect should have no bearing on this contaminated land assessment (as the material will be removed regardless), BRD do not concur with the current owner's opinion and would agree with the EA's position that the material stockpiled on site is all waste.

2.10. PREVIOUS GROUND INVESTIGATIONS

BRD is not aware of any previous ground investigation at the site.

3. PRELIMINARY CONTAMINATION RISK ASSESSMENT

3.1. HAZARD IDENTIFICATION

INVALID CONTAMINATION SOURCES	
HISTORIC LAND USE	**DISCUSSION AS TO WHY THE HISTORICAL USE IS NOT CONSIDERED TO PRESENT A PLAUSIBLE HAZARD**
Infilled pond / ditch	Approximately 40m and 96m to the south west and west of the site, records of potentially infilled water features are indicated in the Envirocheck report. Based on the historical mapping these features were quite small in size and given the distance to the site as well as the subsequent residential development in the area, these potentially infilled features are not considered to present an a plausible hazard to the site from the migration of soil gasses.

POTENTIAL ON SITE SOURCES		
HISTORIC LAND USE	**DESCRIPTION OF POTENTIAL CONTAMINATION HAZARD**	**POTENTIAL CONTAMINANTS OF CONCERN**
Storage of fridges / scrap metal.	The site is used for the storage of a vast quantity of fridges and scrap metal across the entire site. Other metal drums and canisters and metal wire, etc, were also present. Many refrigerators, particularly older fridges, contain ozone depleting substances such as chlorofluorocarbons (CFCs) mainly within the coolant and insulating materials. The use of CFCs was phased out in 1994 and modern fridges contain a substitute called pentane. Whilst CFC releases are as gas and do not offer a significant risk of soil or groundwater contamination, there is the potential for pieces of insulating material to be present in the surface soils, which would in turn be hazardous waste. Fridges may also contain hazardous components. For example, the cooling circuit can contain oils and solvents. Some refrigerators manufactured prior to 2000 have mercury-containing components. Appliances manufactured prior to 1979 may contain polychlorinated biphenyls (PCBs) capacitors. Asbestos containing materials could also have been used within some older fridges, as insulation or around pipes or switchgear. Contamination of the soils and groundwater may have occurred through spillages of any of these chemicals.	Metals, including mercury. Solvents. Petroleum hydrocarbons (e.g. oils). Polychlorinated biphenyls (PCBs). Asbestos containing materials (e.g. flash guards, pipe insulation, thermal insulation). Insulation foam fragments.

POTENTIAL ON SITE SOURCES		
HISTORIC LAND USE	**DESCRIPTION OF POTENTIAL CONTAMINATION HAZARD**	**POTENTIAL CONTAMINANTS OF CONCERN**
Builder's Yard in the 1930s.	Generally there is a limited potential for contamination from this land use as the majority of buildings materials are relatively inert. However, localised spillages of fuels may have occurred as well as the contamination of the surface soils by asbestos.	Petroleum hydrocarbons (TPH). Asbestos containing materials (e.g. cement asbestos building products). Polycyclic Aromatic Hydrocarbons (PAH).
Elevated concentrations of Lead in the soils.	The Envirocheck report indicates that the background concentrations of Lead within the surface soils may be elevated in the local area. Such elevated concentrations are typically encountered in urban environments as a consequence of air pollution from industries and vehicles.	Lead.
Ashy soils / bonfires.	Evidence of ashy soils and bonfires were observed during the walkover which could result in localised contamination of the near surface soils from burned chemicals and materials.	Polycyclic Aromatic Hydrocarbons (PAH). Metals

POTENTIAL OFF SITE SOURCES		
HISTORIC LAND USE	**DESCRIPTION OF POTENTIAL CONTAMINATION HAZARD**	**POTENTIAL CONTAMINANTS OF CONCERN**
Historic Worked Ground / deep Made Ground soils.	The wider area surrounding the site has been subject to widespread historic infilling and worked ground associated with historic brickworks. The nearest reported worked ground is approximately 200m to the south east of the site, which relates to the former Uxbridge Road, Brickworks. This worked ground could have been infilled with organic materials that could degrade and generate landfill gases, which could in turn migrate to the site.	Soil gases (mainly carbon dioxide and methane).

3.2. RECEPTOR ASSESSMENT

CONTEXT	
ASSESSMENT LAND USE CATEGORY	Residential.
DESCRIPTION OF PROPOSED LAND USE	It is proposed that the site will be developed with an apartment block of 8No. flats surrounded by communal landscaping and also one separate house with a private garden. A new access road and car parking area will also be constructed.

RECEPTORS	
RECEPTOR	**DISCUSSION**
HUMAN HEALTH	Residents with zero to 6 year old child being the most sensitive receptor.
CONTROLLED WATERS GROUNDWATER	The Langley Silt Member is designated as Unproductive Strata, however, the underlying River Terrace Deposits in the area are designated as a Principal Aquifer. The deeper London Clay Formation is also designated as Unproductive Strata.
CONTROLLED WATERS SURFACE WATER	Yeading Brook is located adjacent to the western site boundary.
BUILDING MATERIALS AND SERVICES	Water service pipes and buried concrete.

3.3. INITIAL CONCEPTUAL MODEL

POLLUTANT LINKAGES	The pollutant linkages are best presented in a diagrammatic form and therefore the initial conceptual site model plan is presented in Appendix 1. The individual pollutant linkages as numbered on the plan are described further in Section 3.4.
INVALID POLLUTANT LINKAGES	Generally no invalid pollutant linkages to the receptors have been identified. The only exceptions are that the elevated background concentrations of Lead in the surface soils don't present a risk to the wider water environment (as the Lead is a function of the wider soils in the area and not unique to the site) or to the building materials and services (as Lead has no effect on them).
LIMITATIONS AND UNCERTAINTIES	Whilst some limited clearance of the site has commenced, large areas of the site remained covered by fridges / scrap metal which prevented inspection of the soils across much of the site. The preliminary conceptual model has been developed based solely on desk based research and assessment. The only way to conclusively determine the presence or absence of contamination is with intrusive site investigation.

3.4. PRELIMINARY ASSESSMENT OF CONTAMINATION RISKS

The following table identifies the potential risks that exist to the receptors through each of the identified pollutant linkages in the conceptual site model. It should be noted that the numbers referred to for each of the pathways refers to the numbered pollutant linkages from the Initial Conceptual Site Model Plan, as presented in Appendix 1.

POTENTIAL SOURCES AND CONTAMINANTS	PATHWAYS (REFERENCE FROM MODEL)	RECEPTORS	HAZARD SEVERITY	PROBABILITY OF OCCURRENCE	POTENTIAL RISK
Use of the site for storage of fridges / scrap metal / as a builders yard. Presence of ashy soils. - Metals - Polycyclic Aromatic Hydrocarbons (PAH) - Petroleum Hydrocarbons (Oils) - Polychlorinated biphenyls (PCBs) - Asbestos containing materials - Solvents - Insulation foam fragments	Ingestion Inhalation Consumption of home grown produce [1]	Future residents	Human health effects [Medium]	Potential for some contamination of surface soils, particularly given the volume of stored scrap fridges on the site. [Likely]	Moderate risk
	Inhalation of vapours [2]				Moderate risk
	Horizontal & vertical migration [3]	Groundwater	Principal Aquifer associated with the underlying River Terrace Deposits [Medium]	Potential for some contamination of surface soils, particularly given the volume of stored scrap fridges on the site. However, the Langley Silt Member beneath the site is also likely to minimise the migration of contaminants to the underlying River Terrace Deposits aquifer. [Low Likelihood]	Moderate to Low risk
	Migration of surface contaminants [4]	Surface Water - Yeading Brook	Contamination of controlled watercourse [Medium]	Potential for some contamination of surface soils, particularly given the volume of stored scrap fridges on the site. However, the sheet piled wall alongside the site will greatly limit any groundwater and surface water flow through the site and into the brook. [Low likelihood]	Moderate to Low risk
	Direct contact [5]	Water supply pipes	Tainting of water supply [Mild]	Potential for some contamination of surface soils, particularly given the volume of stored scrap fridges on the site. [Likely]	Moderate to Low risk

Background elevated concentrations of Lead.	Ingestion Inhalation Consumption of home grown produce [6]	Future residents	Reduced human health effects from elevated background levels. [Mild]	The site has remained undeveloped throughout its history so will have been subject to atmospheric fallout throughout this time. [Likely]	Moderate to Low risk
Migration of soil landfill gasses from historic worked ground.	Inhalation [7]	Future residents	Human health effects [Medium]	Potential for migration of soil gasses from historic worked ground is unlikely due to the distance from site and age of the worked ground. [Unlikely]	Low risk

3.5. RECOMMENDATIONS

This Phase 1 desk study assessment has identified some potential pollutant linkages on the site arising from the stockpiled fridges and scrap metal on the site, largely arising from potential leakages of chemical and incorporation of materials into the surface soils. Accordingly, some Phase 2 Contamination Assessment is necessary to assess the significance of these potential pollutant linkages and whether they pose any contamination risk to the receptors.

However, it is not considered that this Phase 1 assessment has identified any significant contamination risks on the site that would preclude any redevelopment and therefore no reason why the subsequent Phase 2 contamination assessment could not be addressed through appropriately worded conditions on a future planning permission for the proposed development.

In the first instance, the site will need to be cleared of all the stockpiled fridges and scrap metal. This will need to be undertaken appropriately with the fridges and other waste streams removed to properly licensed disposal sites. Following the removal of all of this material, it should be confirmed with the EA that there are no ongoing waste management legacy issues for the site that could arise in future conveyancing searches.

Once the site is clear, then in terms of the Phase 2 assessment, it is recommended that this includes the following investigation elements:

- A series of trial pits across the site surface to enable the near surface soil make-up to be inspected, particularly in regard to identifying whether any fragments of insultation materials or solid waste items remain in the soils.

- A series of shallow boreholes (4m-5m depth) should be drilled around the site to determine the soil and groundwater profile and to enable the installation of gas and groundwater monitoring installations.

- Chemical analysis of the soils taken from the trial pits and boreholes, together with surface water samples from Yeading Brook and groundwater samples for a contaminant suite appropriate to the identified potential sources.

- A programme of gas monitoring visits to determine whether there is any requirement for gas protection measures at the site.

4. IMPLICATIONS FOR CONSTRUCTION

4.1. GEOTECHNICAL CONSIDERATIONS

The following is a checklist summary of geotechnical hazards and their likelihood to have an impact on the proposed development of the site.

GEOTECHNICAL HAZARD	LIKELY TO AFFECT SITE?	COMMENT
Existing sub-structures affecting new foundations.	✓	The presence of the sheet piled wall alongside the Yeading Brook to the west of the site needs to be considered in foundation design for the new development. Any new foundations and structures should be designed to avoid any influence on this wall.
Deep Made Ground.	✘	None identified.
Historic wells.	✘	None identified.
Soft or compressible natural deposits such as Alluvium or Peat.	✓	Could be present across the site associated with the former stream / brook that flowed alongside the south eastern boundary.
Changes in ground conditions within short distances.	✓	The potential for alluvial deposits, coupled with a potentially variable Langley Silt Member may result in differing soil properties across the site, which in turn may complicate the design and construction of foundations.
Fine soils that have a volume change capacity.	✓	The soils of the Langley Silt are likely to have an increased volume change potential which will likely impact on foundation design and depths. Existing and proposed trees will further complicate foundations.
Dissolution features or 'swallow holes'.	✘	None identified.
Cambering of valley sides with possibility of 'gulls'.	✘	None identified.
Risk of slope instability.	✘	The site is flat.

GEOTECHNICAL HAZARD	LIKELY TO AFFECT SITE?	COMMENT
Shallow groundwater.	✓	Given the presence of the Yeading Brook next to the site and its original course on the opposite side of the site, it is likely that there is shallow groundwater beneath the site. This could result in construction difficulties and have implications for the design of sub-surface structures.
Underground mining.	✘	None identified.
Geological faults.	✘	None identified.
Aggressive chemical environment for concrete e.g. expansive slag or high sulphate soils.	✓	The soils of the Langley Silt and the deeper London Clay are likely to be elevated in sulphates. This may affect the design and construction of sub-surface structures.

4.2. PRELIMINARY GEOTECHNICAL ASSESSMENT

Whilst the soils of the Langley Silt Member would usually be suitable for conventional spread foundations, it is considered that the following factors will likely result in a piled foundation solution for the proposed new buildings:

- Shallow groundwater is likely to be present across the site which will enter foundation excavations and make them difficult to form.
- Shallow foundations will likely have an impact on the sheet piled wall alongside the site. Deeper foundations, e.g. piles, would be needed to avoid this.
- There are several trees along the boundary of the site and within it which will impact the foundation depths, assuming clay soils are present, and will likely necessitate deeper foundations.
- If present, any alluvial soils are likely to be highly variable and not suitable for foundations. However, to extend through these soils and into the underlying Langley Silt will lead to the other construction difficulties identified above.

It should also be noted that the former stream / brook alongside the south eastern boundary was either culverted or backfilled and its presence could have an impact on construction in proximity to this boundary.

The anticipated clayey ground conditions combined with likely shallow groundwater would suggest that soakaways for surface water drainage are unlikely to be suitable.

For any form of development, BRD recommend that an intrusive ground investigation is undertaken in order to confirm ground conditions and enable design of the new structures. Such an investigation could easily be incorporated into the recommended Phase 2 Contamination Assessment.

4.3. CONSTRUCTION CONSIDERATIONS

As with any construction site, if any anomalous material is encountered during the redevelopment then expert environmental advice should be sought.

REPORT SPECIFIC REFERENCES

- https://northoltgrange.files.wordpress.com/2010/06/brick-making-in-northolt.doc

- British Geological Survey, Sheet 256, 'North London', Solid and Drift Geology Edition (1:50,000), published 2006.

SUPPORTING INFORMATION

SITE CHARACTERISTICS

The site characteristics are collated from various information sources, including but not limited to Ordnance Survey, British Geological Survey (BGS), Environment Agency (EA) and local authorities.

BRD generally commission the Landmark Information Group to produce an Envirocheck Report for study sites and where employed this is included in the Appendices. It should be noted that some of the data provided in the Envirocheck report is not considered within BRD's interpretation for the site characteristics as it is not relevant. Examples of this are:

- *Nitrate Sensitive Zones and Nitrate Vulnerable Zones are ignored as these are only applicable to agricultural activities relating to the application of manure and fertilisers to land.*
- *River Quality is ignored as at this preliminary stage of risk assessment as all surface water bodies are considered equally sensitive to contamination risks.*

In assessing site characteristics, BRD also consider the area within a surrounding 250m buffer zone extending from the site boundary.

HISTORY

Mapped History

The site history summarises the changes in use or layout of the site over time and is largely developed from a study of available Ordnance Survey maps. It should be noted that changes to the site may have occurred between the editions of the maps employed to assess the history of the site. Historical information of relevance within the 250m surrounding the site is also discussed in a separate section. The historical plans referred to in the text are generally included in an Appendix.

Aerial photography

As a minimum, current and historical aerial images of the site and surrounding areas are studied from the Google Earth program. Where additional historic aerial photographs have been purchased then these are referenced within the technical report.

Internet Searches

A simple search of the internet for relevant material relating to the use or history of the site is made. Information obtained from internet searches has been accepted as fact without validation by BRD except for ensuring the source is reputable. It should be recognised that due to programme and budgetary constraints the search conducted may not have revealed all the information available.

GEOLOGY

The geology of the site is assessed by reference to the relevant British Geological Survey (BGS) 1:50,000 scale sheet in Bedrock and Superficial (historically Solid and Drift) edition. Many of these geological maps are relatively old with superseded terminology and descriptions. BRD therefore employ the BGS Open Geoscience website to determine current nomenclature of strata and to assist in determining geological boundaries against current topographic features. BRD also employ BGS Regional Geology Guides to assist in understanding the geological context of the site.

Ground Stability Hazards

Ground stability hazards caused by mining, ground dissolution, landslide potential, collapsible ground and natural cavities are identified by the Envirocheck database search of records held by The Coal Authority, British Geological Survey and studies completed by Ove Arup and Peter Brett Associates.

The Envirocheck database ground stability hazard entries for compressible ground, running sands and shrinking or swelling clays are not discussed directly. This is because these hazards are very common and are considered within the preliminary geotechnical assessment where necessary.

Radon

Radon is a naturally occurring colourless and odourless gas that is radioactive. It is formed by the radioactive decay of radium which in turn is derived from the radioactive decay of uranium, both of which are minerals that can be found in many soil types. Whilst it is recognised that the air inside every house contains radon, some houses built in certain defined areas of the country might have unacceptably high concentrations and require special precautions to be taken during construction to reduce this risk.

Radon can move through cracks and fissures in the soil into the atmosphere or into buildings via basements and/or underfloor voids. If radon enters the living space of buildings its concentration can potentially increase and provide a risk to human health as the inhalation of the radioactive decay products of radon gas can increase the risk of developing lung cancer.

The maps contained within 'Radon: Guidance on protective measures for new buildings' (2015) identify areas where no radon protection measures are necessary or where higher concentrations are present that either basic or full radon protection measures are required to be fitted to all new buildings together with supplementary advice concerning extensions, conversions and refurbishments. However, some local authorities have local bylaws, that BRD may not be aware of, that insist on radon protection to all new dwellings within their area regardless of the recommendations of the 'Radon: Guidance on protective measures for new buildings' (2015) report.

Basic radon protection measures comprise incorporation of a continuous gas resistant membrane sealed at joints and around service entries into the floor construction and extended across the cavity tray.

Full radon protection measures comprise incorporating a continuous gas resistant membrane into the floor construction together with a ventilated sub-floor void through either the use of suspended floor construction or a 'radon sump'. The membrane is sealed at joints and around service entries into the floor and extended across the cavity tray.

'Radon: Guidance on protective measures for new buildings' (2015) should be referred to for detail on the construction of the protective measures.

HYDROGEOLOGY

Aquifer Designations

The Environment Agency's Groundwater Protection Policy uses designations that reflect the importance of aquifers in terms of groundwater as a drinking water resource, but also their role in supporting surface water flows and wetland ecosystems.

In defining groundwater vulnerability, both the superficial (drift) deposits and bedrock (solid) geology are considered separately with the following aquifer designations:

- *Principal Aquifers: These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.*
- *Secondary Aquifers: These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:*
    - *Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.*
    - *Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.*
- *Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type.*
- *Unproductive Strata: These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.*

Source Protection Zones

The Environment Agency (EA) has defined Source Protection Zones for groundwater sources, such as boreholes and springs, that are used for public water supply. The EA uses the zones to target pollution prevention measures and monitor the activities of potential polluters within the affected area. There are three types Source Protection Zone:

- *Zone 1(Inner Protection Zone) is the most sensitive area within which pollution could reach the borehole within 50 days. Alternatively it is defined by a minimum 50m radius around the borehole.*
- *Zone 2 (Outer Protection Zone) are defined by the area within which pollution could reach the borehole within 400 days or 25% of the total catchment area.*
- *Zone 3 (Total Catchment) are defined by the total area required to support the removal of water from the borehole.*

HYDROLOGY

Flooding

The Environment Agency has zoned England and Wales in respect of the risk from flooding from 'highly unlikely' in Zone 1 to 'likely' in Zone 3. The zones ignore the presence of flood defences or certain other manmade structures and channel improvements.

National Planning Policy Framework, Department for Communities and Local Government, dated March 2012 states "A site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding".

ENVIRONMENTAL ASPECTS

Landfill

The database of the Environment Agency of active and historic landfills is searched for all sites. Sometimes additional historic landfill data is available from the British Geological Society and local authorities to identify nearby landfill sites. It should be noted that landfill sites that closed prior to 1974 and unlicensed disposal activities will not necessarily be revealed by this search.

Pollution Incidents

The Environment Agency ceased recording 'Pollution Incidents to Controlled Waters' in 2000, when they commenced the replacement 'Substantiated Pollution Incident Register'. BRD do not consider any 'Category 3 – Minor Incident' on the 'Pollution Incidents to Controlled Waters' database as relevant to assessing the site due to the time elapsed and the low level of impact that occurred. Again due to the time elapsed and the fact that remedial measures would have been undertaken at the time, 'Category 1 – Major Incident' and 'Category 2 – Significant Incident' are only considered relevant if the impacted controlled water was on or immediately adjacent to the site.

On the 'Substantiated Pollution Incident Register', BRD approach to this information in the following manner:

- *Pollution incidents impacting 'air' only are not considered relevant.*
- *Pollution incidents to 'water' are only considered where the surface water impacted is either on, flows through or is immediately adjacent to the site.*
- *Pollution incidents to 'land' are only considered where these are on or immediately adjacent to the site unless there are grounds to consider that the incident had the potential to impact groundwater that may have migrated beneath the site.*
- *Category 4 potential pollutant incidents are recorded, but upon investigation were found to have had no impact and accordingly are not considered relevant.*

Ecologically Sensitive Land Use

The land uses that are identified as ecologically sensitive are those identified as Sites of Special Scientific Interest (SSSI), Special Areas of Conservation, Special Protection Areas, Ramsar sites, Natural Parks, Natural Nature Reserves, Marine Nature Reserves, Local Nature Reserves, Green Belt, Forest Parks, Environmentally Sensitive Areas, or Areas of Outstanding Natural Beauty.

CONTAMINATION ASSESSMENT METHODOLOGY

UK Policy

The UK Government's policy in relation to land affected by historic contamination is based on a 'suitable for use' approach. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Contamination risks therefore need to be assessed on a site-by-site basis. The 'suitable for use' approach limits requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to either the current use or future use of the land.

The three main drivers for contamination assessment and remediation are:

- *Voluntary action.*
- *Development as part of the planning regime.*
- *Regulatory action to mitigate unacceptable risks e.g. Part 2A of the Environmental Protection Act 1990.*

Pollutant Linkages

For a contamination risk to exist there must be a 'pollutant linkage' from the contaminant (source) via a pathway (the route from contaminant to receptor) to a receptor (the entity that could be harmed). The absence of a contaminant, pathway or receptor breaks the pollutant linkage and therefore no contamination risk exists.

Contamination is typically present at a site (in the ground and/or in the underlying groundwater) as a result of a historic or current industrial use, usually as a result of leaks, spills or disposal of residues, wastes and excess raw materials from the industrial processes. Contamination may also be present due to:

- *The deliberate application of chemicals e.g. the spraying of herbicide/pesticide.*
- *Migration of pollutants from adjacent land.*
- *Naturally occurring processes e.g. elevated concentrations of particular heavy metals associated with specific geological strata.*

Conceptual Site Model

The conceptual site model can be defined as a textual or graphical representation of the identified pollutant linkages for a given site. The model forms the basis for designing the investigation as the aim will be to target all of the potential pollutant linkages to determine, through the subsequent phases of risk assessment, whether or not they pose an actual risk.

It is important that the conceptual site model is updated with new information as the various investigation, risk assessment and remediation works are completed.

Technical Guidance

The technical and legal framework for contamination assessment is complex. The process adopted through this report for assessing contamination risks is in general accordance with the following guidance, as listed below:

- *'Investigation of Potentially Contaminated Sites - Code of Practice - BS 10175: 2011', BSi, 2011.*
- *'Model Procedures for the management of Land Contamination - CLR Document No. 11', Environment Agency, 2004.*
- *'Guidance for the safe development of housing on land affected by contamination - R&D66: 2008', NHBC/Environment Agency, 2008.*

Risk Assessment Methodology

In line with the technical guidance, the contamination risk assessment follows a series of phased stages for each particular site:

PHASE	***DESCRIPTION***	***RISK ASSESSMENT STAGE***
PHASE1	*Generally limited to desk based research and a site walkover survey to develop an initial conceptual site model and identify what risks, if any, are likely to be presented by the site.*	*Hazard Identification and Assessment* *A preliminary stage of risk assessment concerned with identifying and characterising the hazards that may be associated with a particular site and identifying potential pollutant linkages.*
PHASE 2	*This phase is concerned with establishing whether contamination is present, usually through intrusive ground investigation, and then evaluating the degree and magnitude of the associated risks.*	*Risk Estimation* *A stage concerned with estimating the likelihood that receptors will suffer adverse effects if they come into contact with, or are otherwise affected by, a hazardous substance or agent under defined conditions.* *Risk Evaluation* *A stage of risk assessment concerned with evaluating the acceptability of estimated risks, taking into account the nature and scale of the risk estimates, any uncertainties associated with the assessment and the broad costs and benefits of taking action to mitigate risks.*
PHASE 3	*The appraisal and selection of remediation techniques, their implementation and verification.*	*Risk Management* *The process whereby decisions are made to accept a known or assessed risk and/or the implementation of action to reduce the consequences or probabilities of occurrence.*

Risk Classification

The objective of risk assessment is to identify the nature and magnitude of the potential risks and should be based on a consideration of both:

- *The likelihood/probability of an event [taking into account both the presence of the hazard and receptor and the integrity of the pathway].*
- *The severity of the potential consequence [taking into account both the potential severity of the hazard and the sensitivity of the receptor].*

There is a need for a logical, transparent and repeatable system in defining the categories of severity of consequence and likelihood as well as for the risk itself and therefore the following risk rating matrix is employed:

		SEVERITY OF CONSEQUENCE			
		SEVERE	***MEDIUM***	***MILD***	***MINOR***
PROBABILITY	***HIGH LIKELIHOOD***	*Very High Risk*	*High Risk*	*Moderate Risk*	*Moderate/Low Risk*
	LIKELY	*High Risk*	*Moderate Risk*	*Moderate/Low Risk*	*Low Risk*
	LOW LIKELIHOOD	*Moderate Risk*	*Moderate/Low Risk*	*Low Risk*	*Negligible Risk*
	UNLIKELY	*Moderate/Low Risk*	*Low Risk*	*Negligible Risk*	*Negligible Risk*

These risk classifications are defined as follows:

- *Very High Risk - There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without appropriate remediation action.*
- *High Risk - Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remediation action.*
- *Moderate Risk - It is possible that without appropriate remediation action harm could arise to a designated receptor. It is relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild.*
- *Low Risk - It is possible that harm could arise to a designated receptor from an identified hazard. It is likely that, at worst if any harm was realised any effects would be mild.*
- *Negligible Risk - The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor.*

This preliminary risk assessment matrix and classification system is based on guidance produced by Department for Environment, Food and Rural Affairs (Defra) and the Environment Agency in connection with contaminated land assessment.

APPENDIX 1

Site Location Plan

Not to scale.

Project Title:	Delamere Road, Hayes
Client:	Roseband Developments Ltd
BRD Reference:	BRD4241-OP1-A
Date Issued:	April 2023

BRD
01295 272244
info@brduk.com

Site Walkover Photographs

Plate 1: Photograph showing the site frontage from Delamere Road.

Plate 2: Photograph of the site access road looking towards Delamere Road.

Project Title:	Delamere Road, Hayes
Client:	Roseband Developments Ltd
BRD Reference:	BRD4241-OP2-A
Date Issued:	April 2023

BRD
01295 272244
info@brduk.com

Site Walkover Photographs

Plate 3: Photograph showing the metal waste / scrap parts stored on site.

Plate 4: Photograph showing scrap fridge condensers stored on site.

BRD
01295 272244
info@brduk.com

Site Walkover Photographs

Plate 5: Photograph showing mixed metal waste stored on site

Plate 6: Photograph of the exposed soils in the cleared path through the stockpiles.

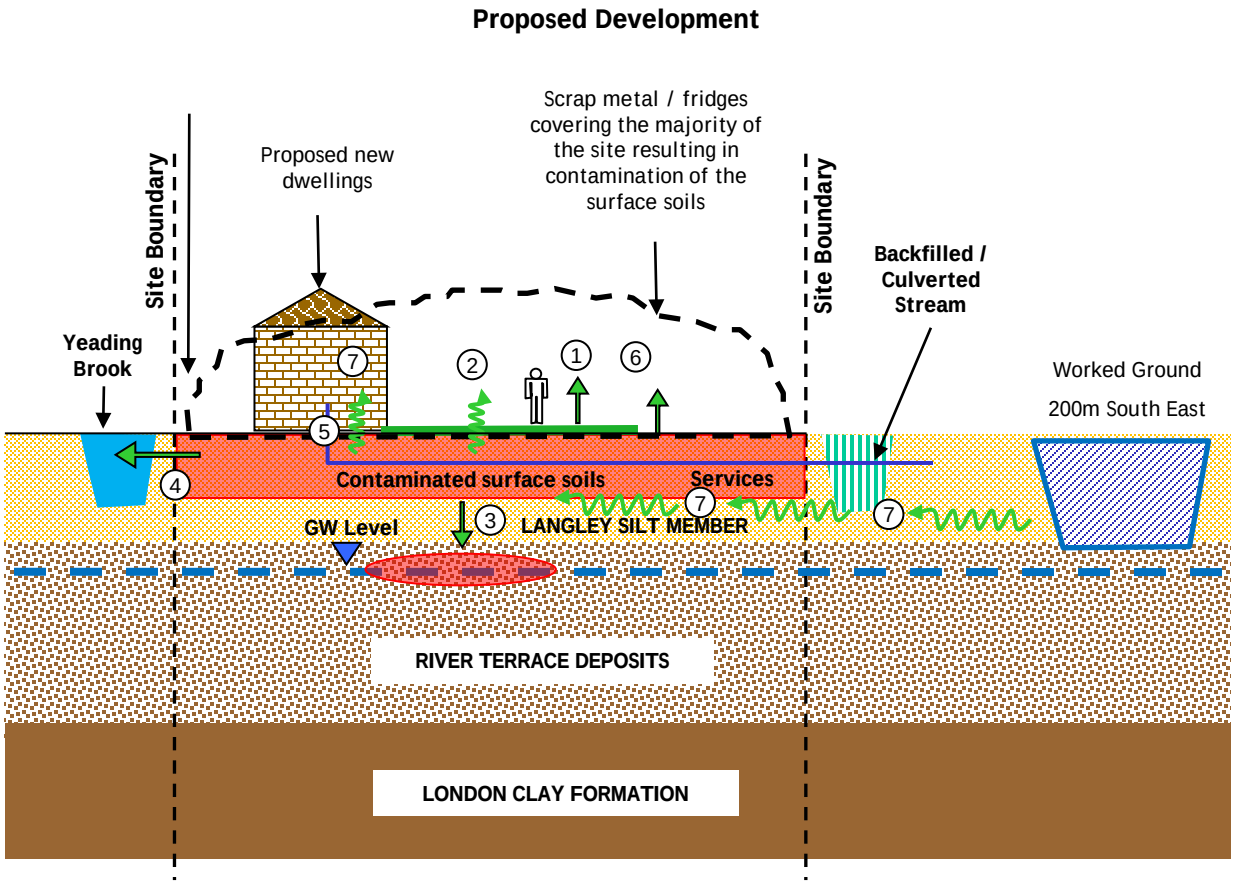
01295 272244
info@brduk.com

Site Walkover Photographs

Plate 7: Photograph of Yeading Brook to the west of the site. The sheet piled wall to the side of the brook can be clearly seen.

Plate 8: Photograph showing the run of the former stream / brook on the opposite side of Delamere Road, opposite the site entrance.

Initial Conceptual Site Model



Project Title:	Delamere Road, Hayes
Client:	Roseband Developments Ltd
BRD Reference:	BRD4241-OP3-A
Date Issued:	April 2023

BRD
01295 272244
info@brduk.com

SITE AREA: 0.1846 ha

ECOLOGICAL BUFFER ZONE: 125.50m²

PROPOSED SITE PLAN

LAND TO REAR OF 12-26 DELAMERE ROAD HAYES UB4 0NL

Coventry Design Limited
River House, 14 Cherry Orchard Road, Molesey
Surrey, KT8 1QZ.
+44 (0) 780 383 0015
info@coventrydesign.com
www.coventrydesign.com

0 10m 20m 30m

Scale (1:500)

PROJECT: Land to rear of 12-26 Delamere Road - UB4 0NL
TITLE: Proposed site plan

SCALE: 1:500 @ A3
DATE: SEP 2022

Coventry Design Associates

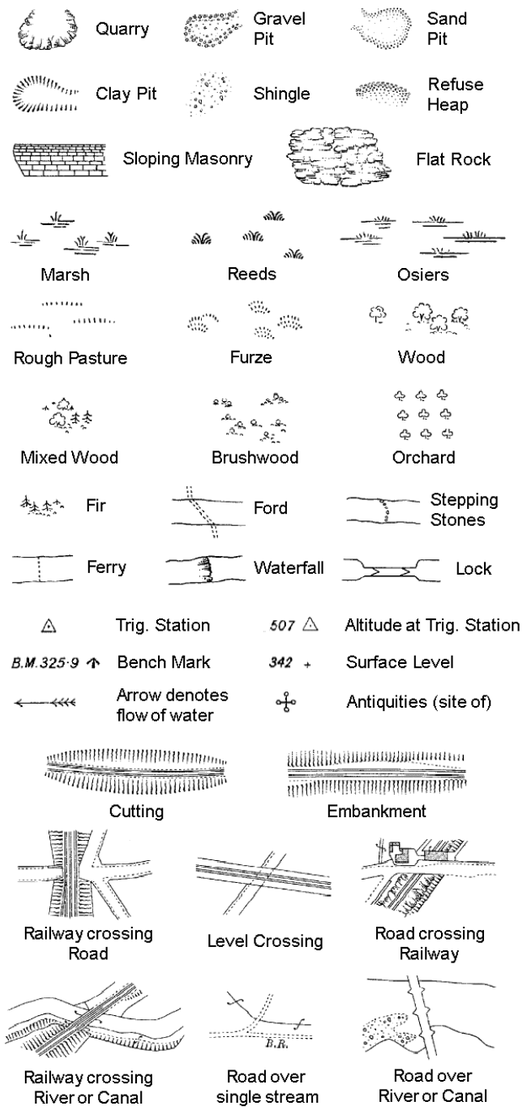
DRG No: 013442

02

APPENDIX 2

Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

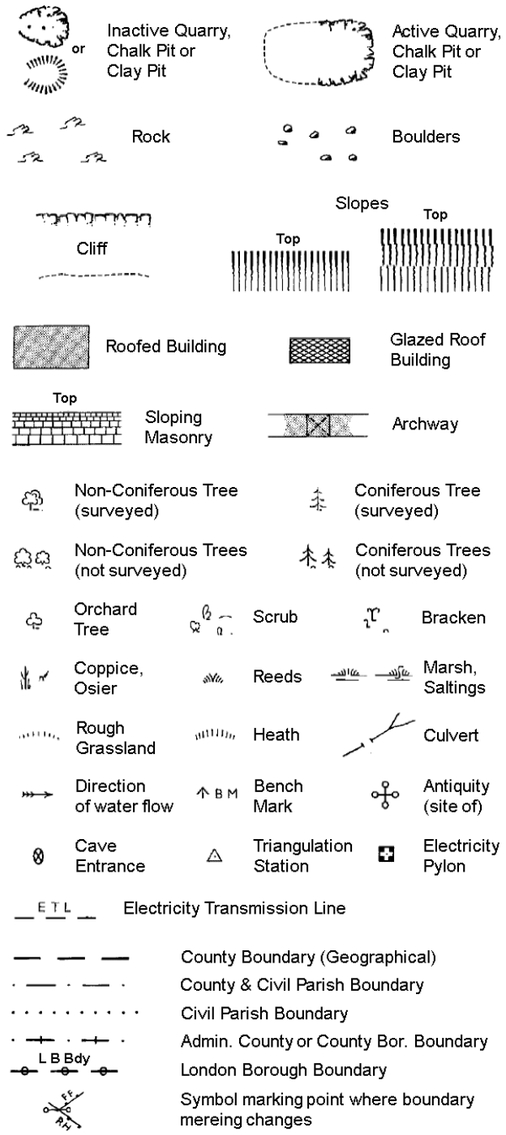
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

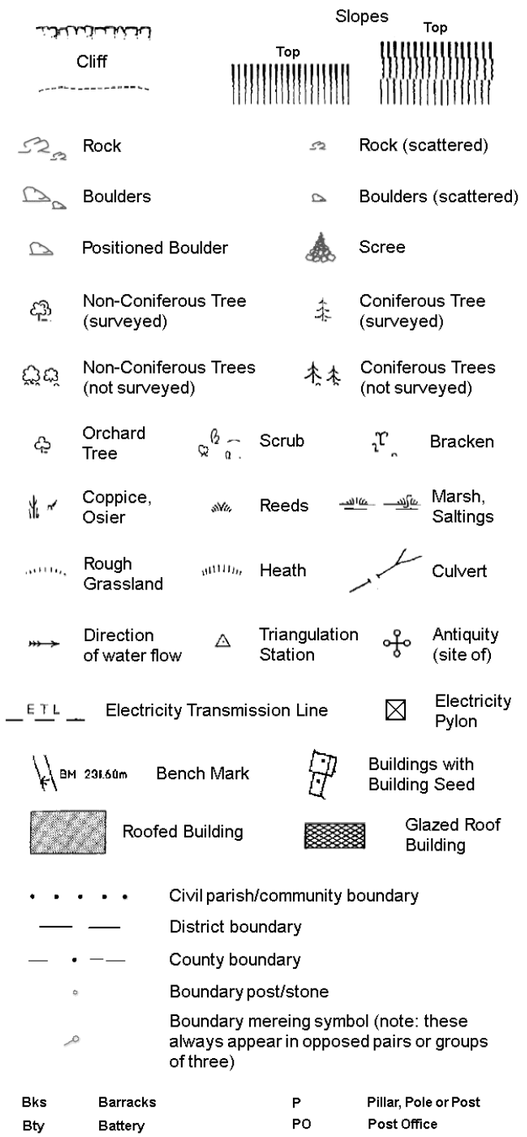
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

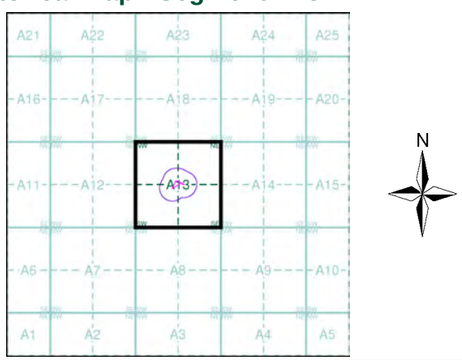
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

BRD

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:2,500	1880	2
Middlesex	1:2,500	1896	3
Middlesex	1:2,500	1914	4
Middlesex	1:2,500	1935	5
Historical Aerial Photography	1:1,250	1947	6
Ordnance Survey Plan	1:1,250	1961	7
Additional SIMs	1:1,250	1961 - 1986	8
Ordnance Survey Plan	1:2,500	1962	9
Additional SIMs	1:2,500	1962	10
Ordnance Survey Plan	1:1,250	1973 - 1974	11
Supply of Unpublished Survey Information	1:1,250	1973	12
Additional SIMs	1:1,250	1981	13
Large-Scale National Grid Data	1:1,250	1991	14
Large-Scale National Grid Data	1:1,250	1993 - 1995	15
Large-Scale National Grid Data	1:1,250	1993 - 1995	16
Large-Scale National Grid Data	1:1,250	1996	17
Large-Scale National Grid Data	1:1,250	1996	18
Historical Aerial Photography	1:2,500	1999	19

Historical Map - Segment A13



Order Details

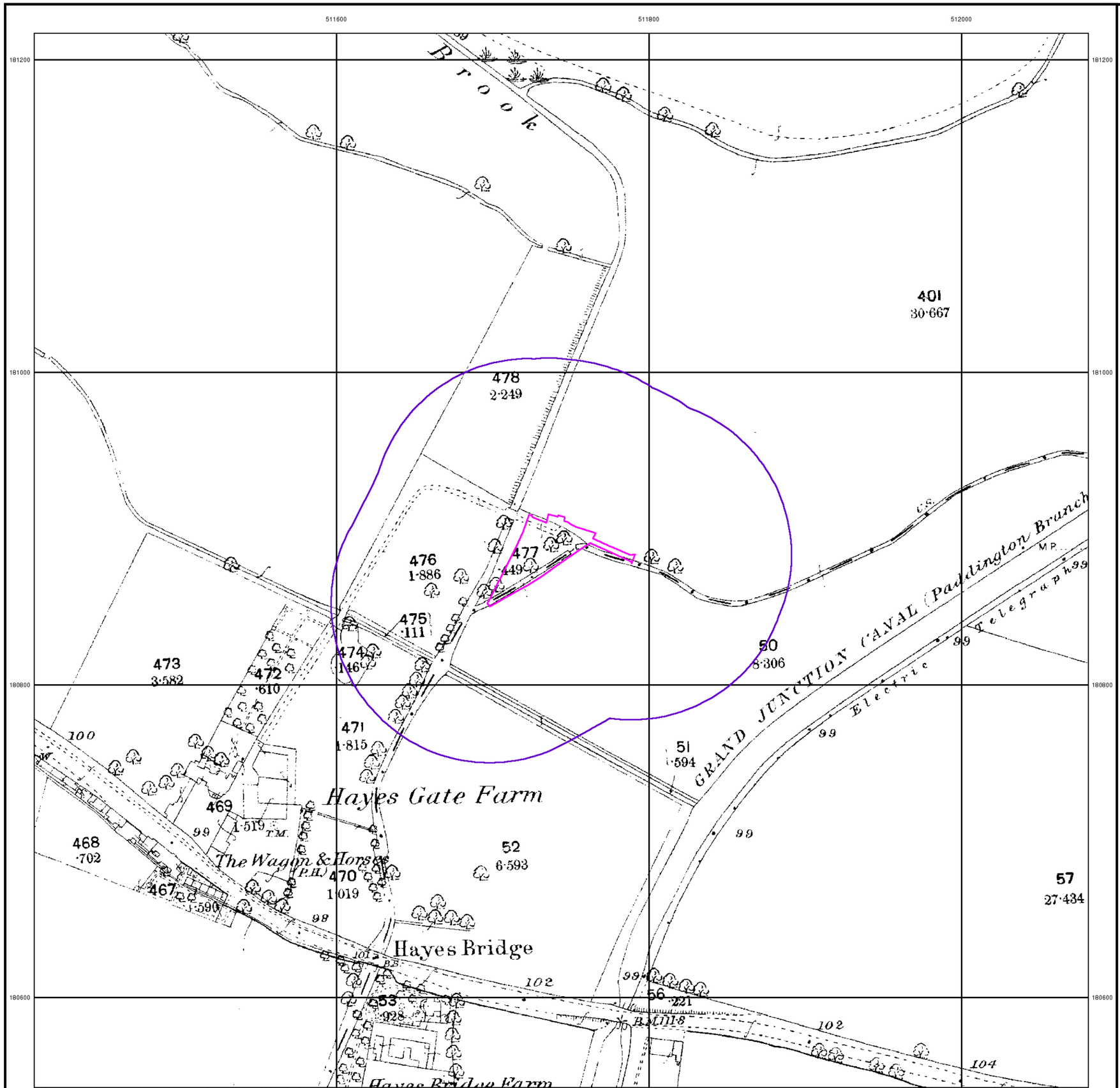
Order Number: 308411552_1_1
Customer Ref: BRD4241
National Grid Reference: 511740, 180880
Slice: A
Site Area (Ha): 0.18
Search Buffer (m): 100

Site Details

Rear of 12-26 Delamere Road, Hayes, UB4 0PW

Landmark INFORMATION GROUP

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



BRD

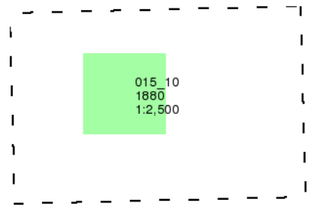
Middlesex

Published 1880

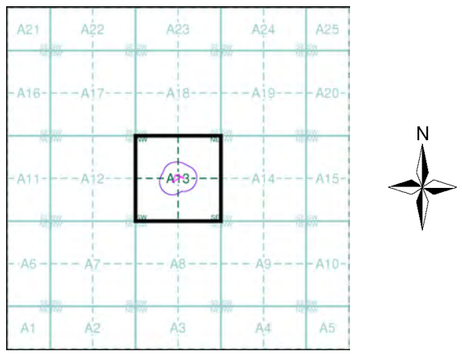
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308411552_1_1
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Site Area (Ha):	0.18
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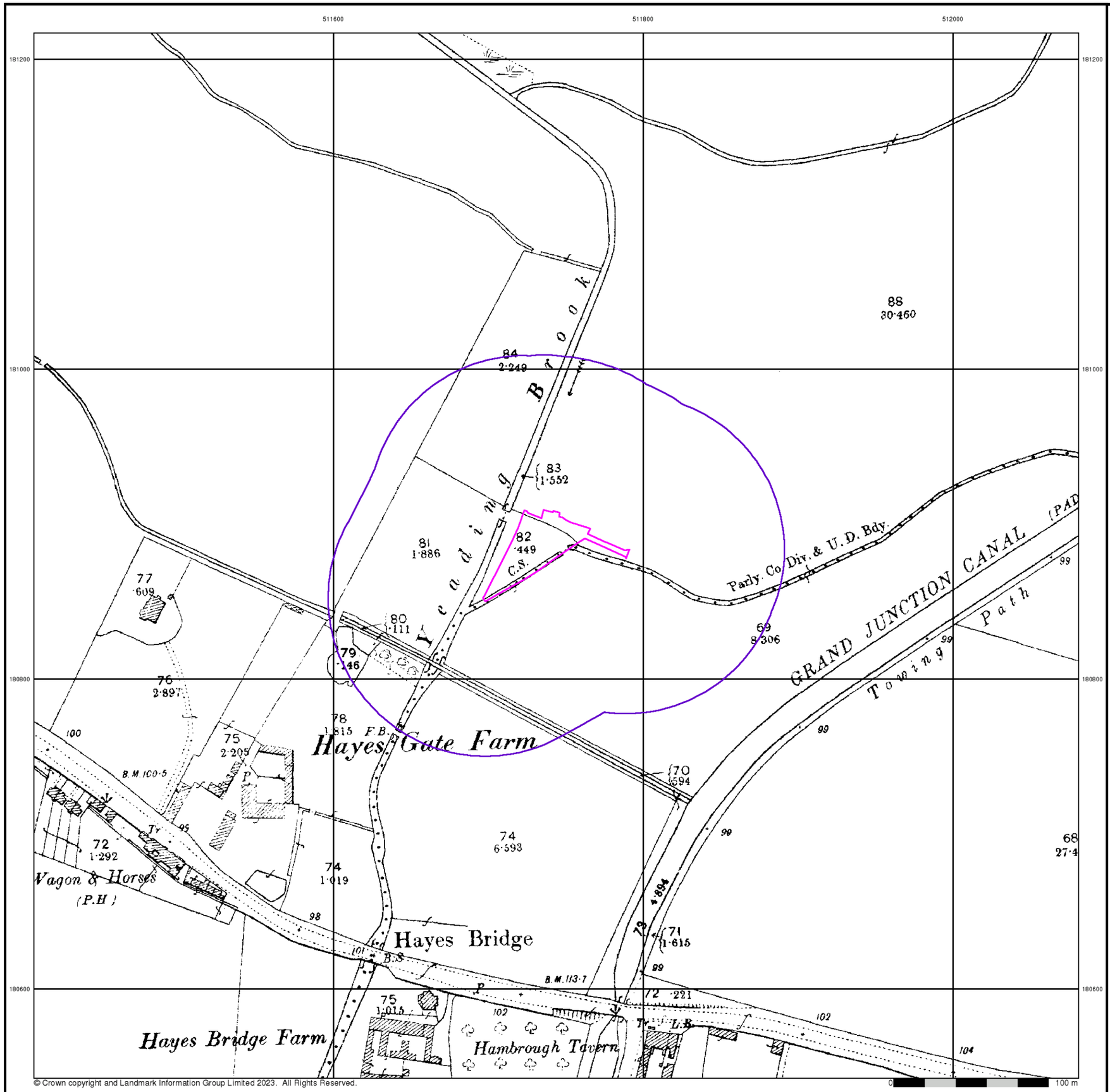


BRD

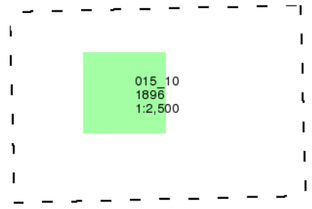
Middlesex

Published 1896

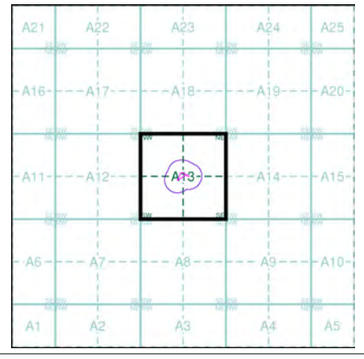
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

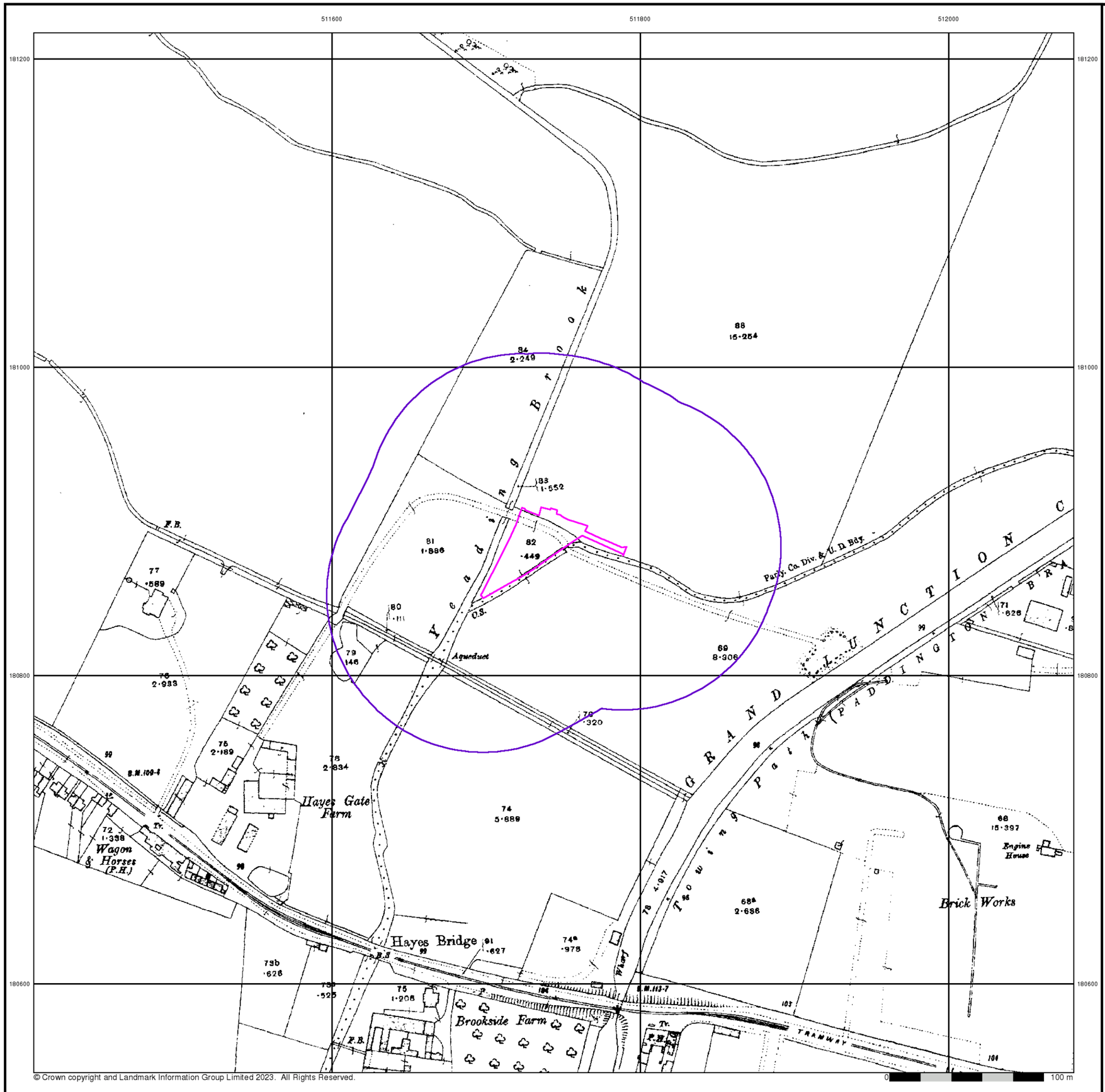


Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

Rear of 12-26 Delamere Road, Hayes, UB4 0PW



BRD

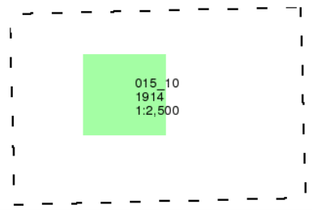
Middlesex

Published 1914

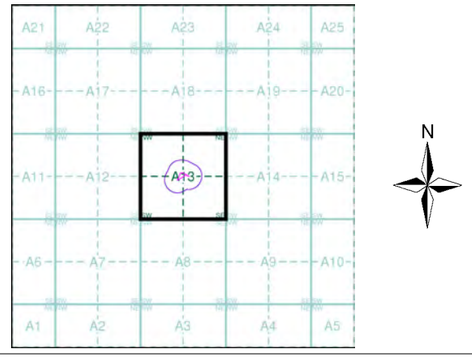
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
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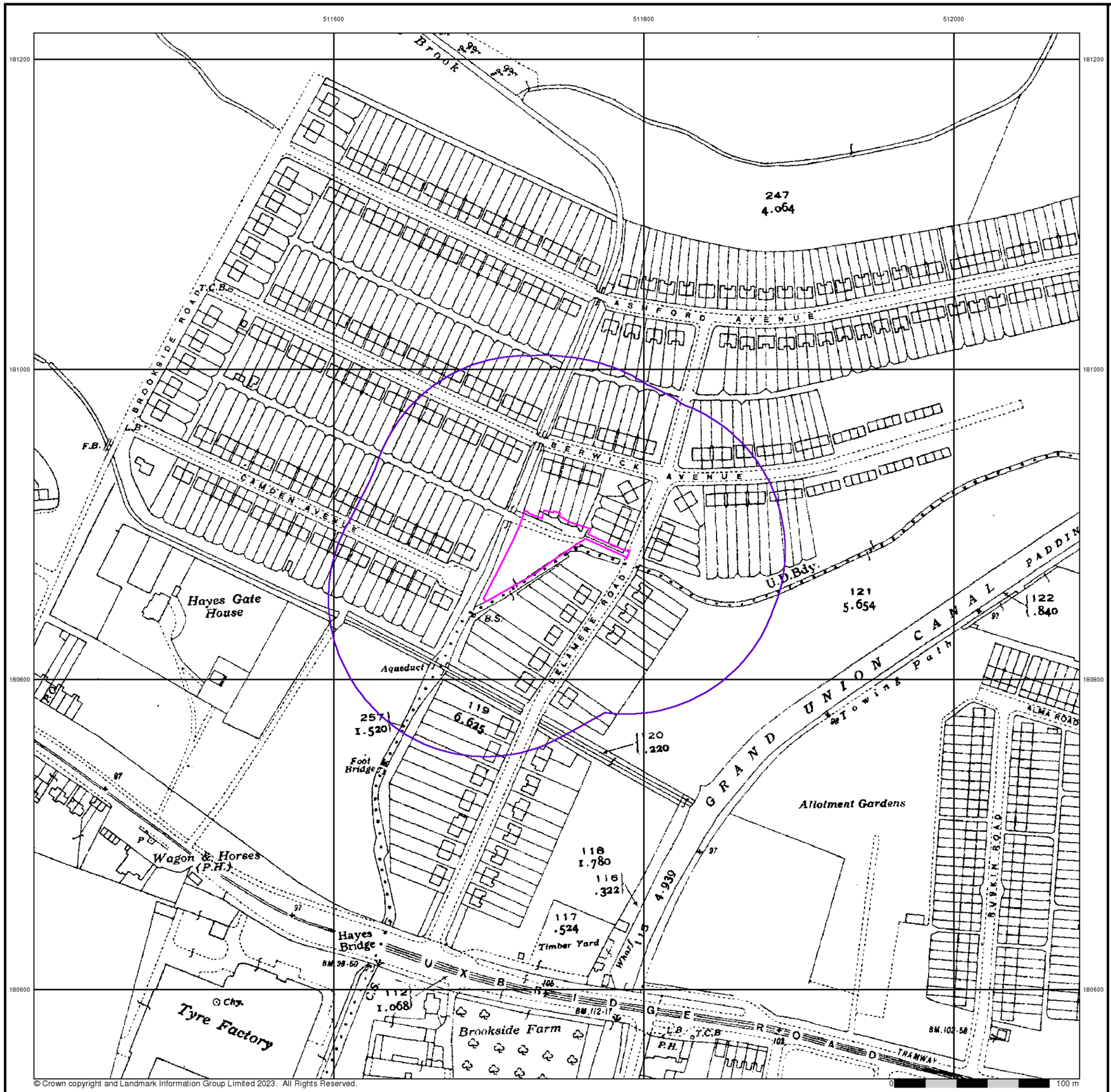


BRD

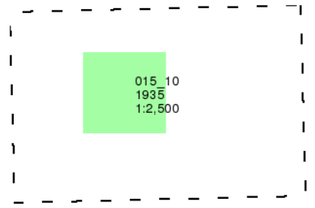
Middlesex

Published 1935

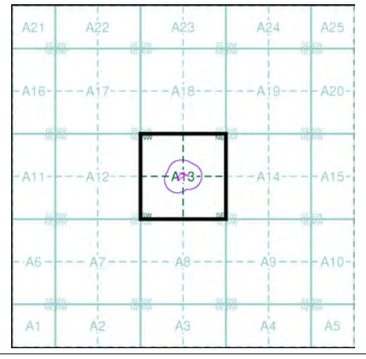
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

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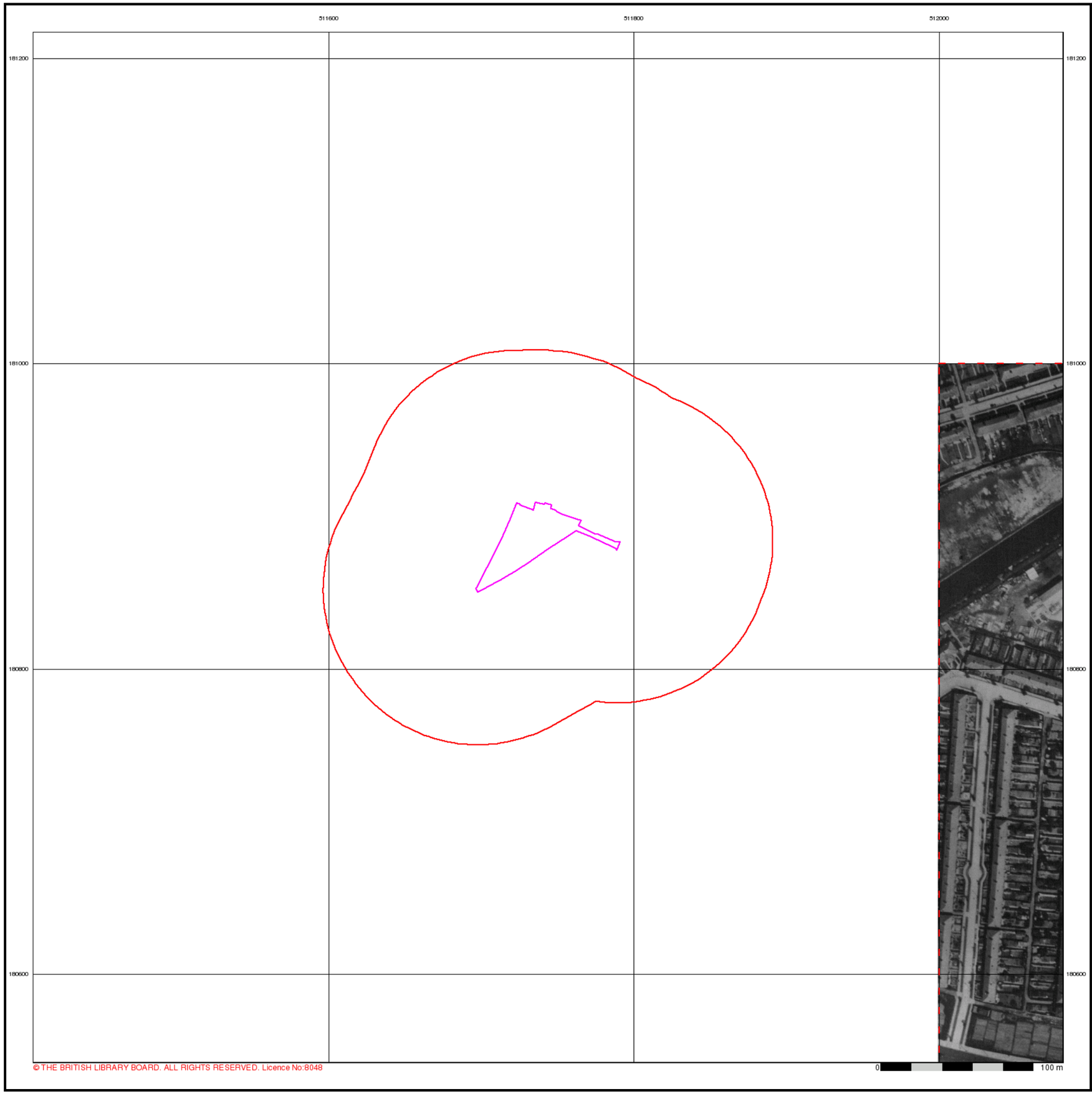


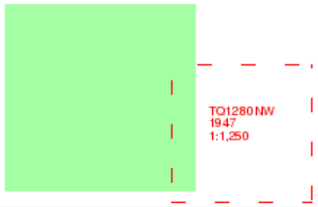
Historical Aerial Photography

Published 1947

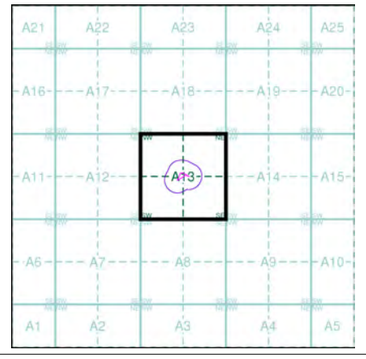
Source map scale - 1:1,250

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

Map Name(s) and Date(s)



Historical Aerial Photography - Segment A13



Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
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Site Details

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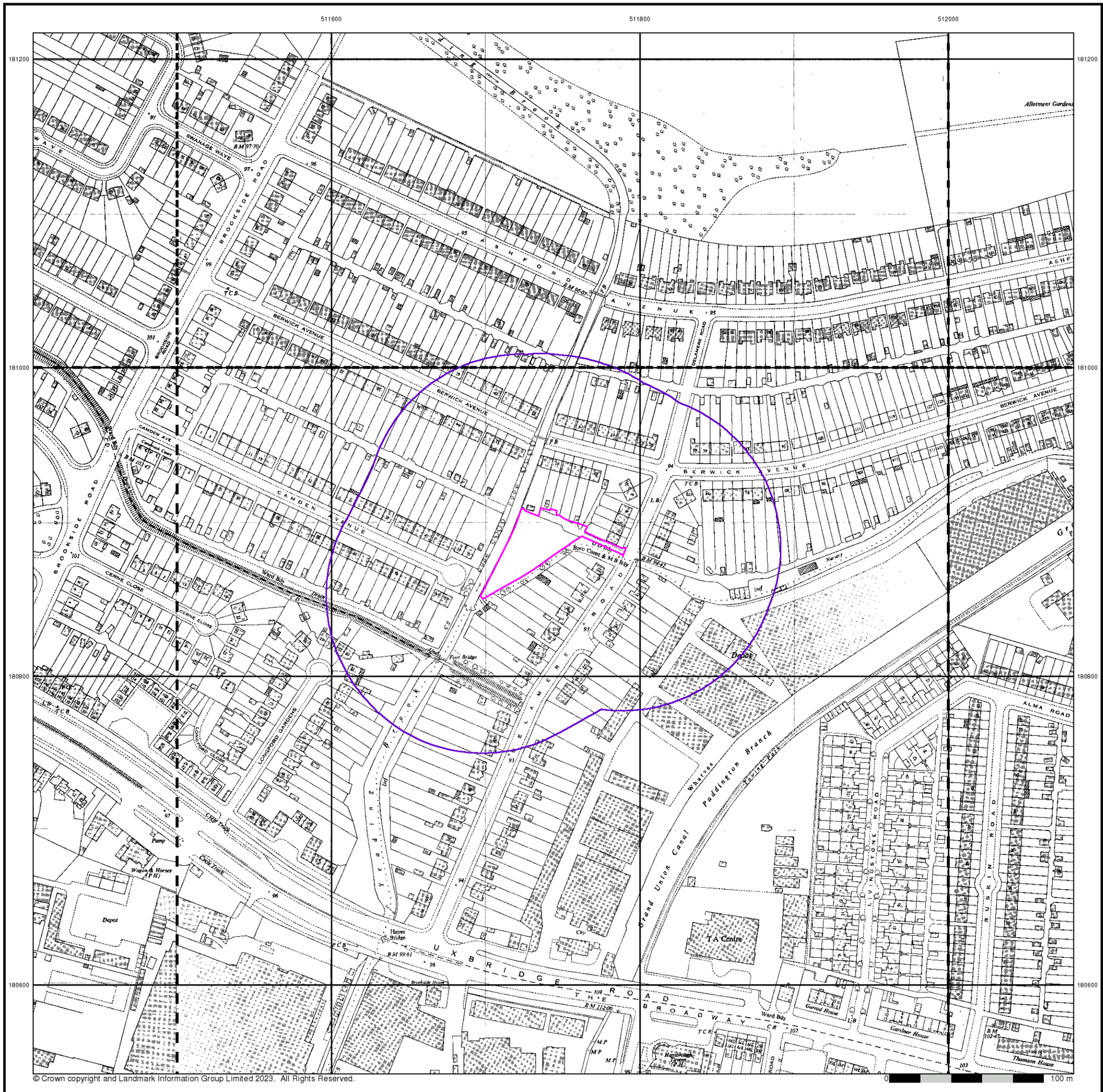


BRD

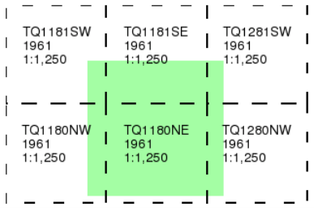
Ordnance Survey Plan

Published 1961

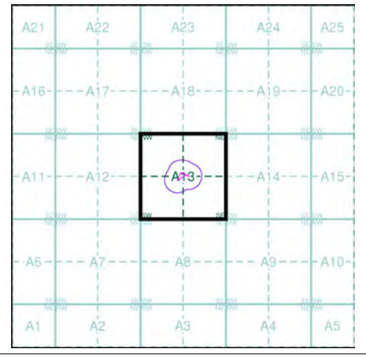
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

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BRD

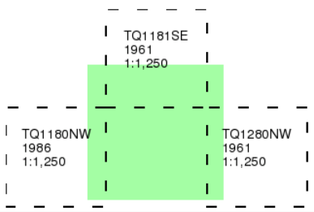
Additional SIMs

Published 1961 - 1986

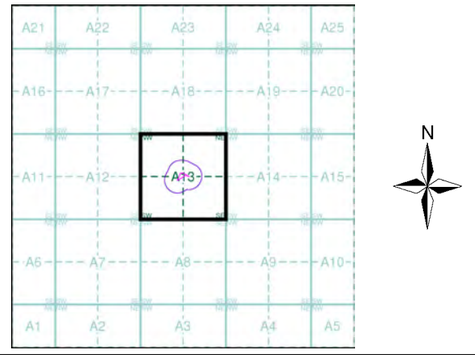
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

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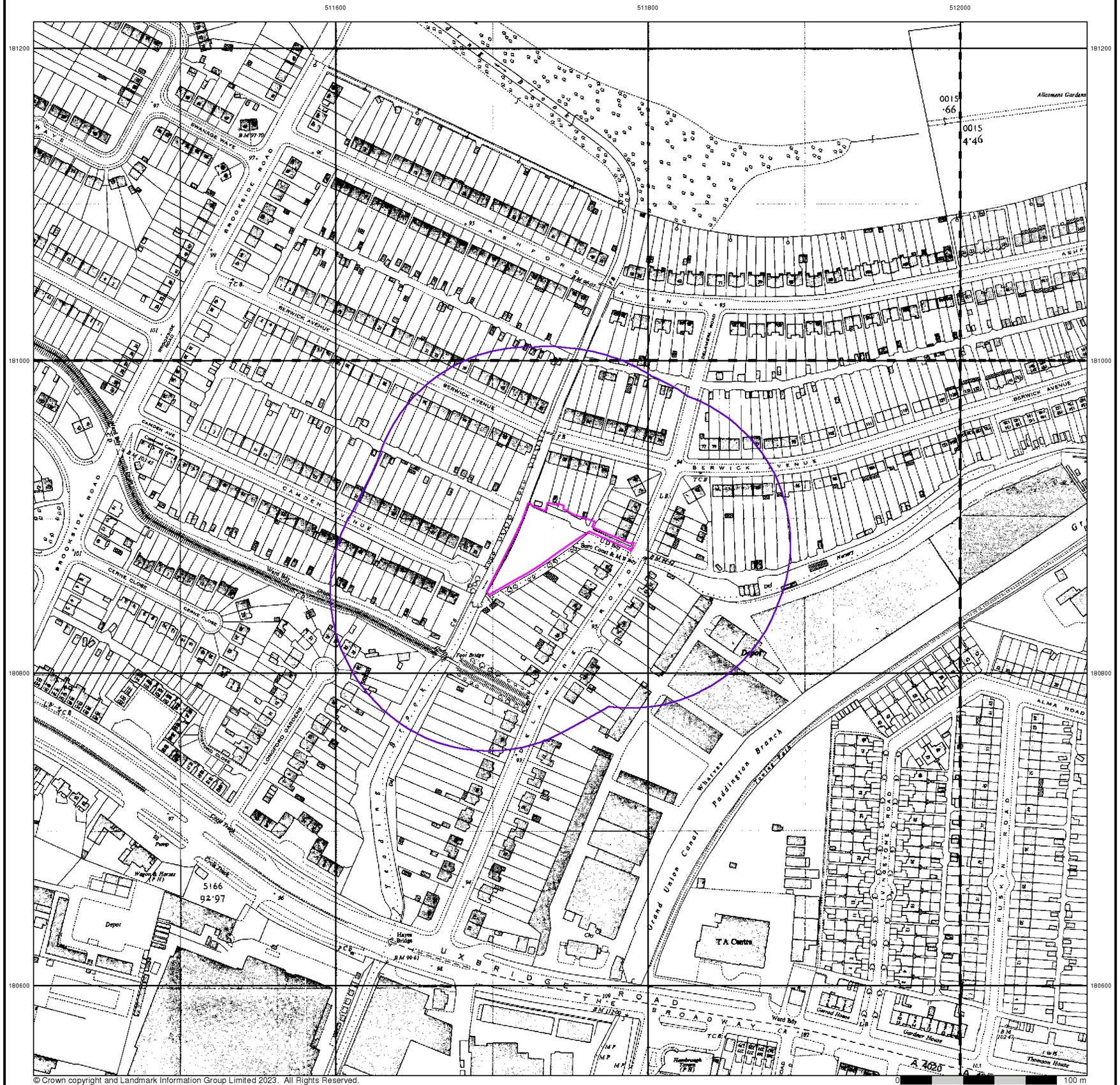


BRD

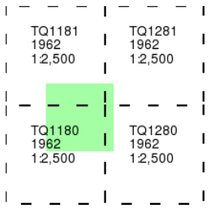
Ordnance Survey Plan

Published 1962

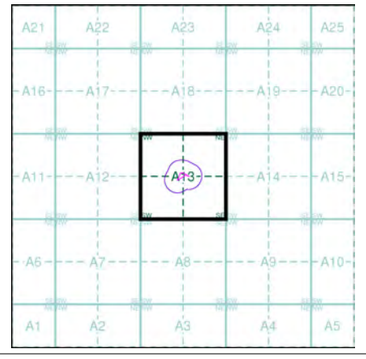
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



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BRD

Additional SIMs

Published 1962

Source map scale - 1:2,500

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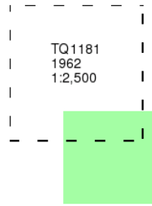
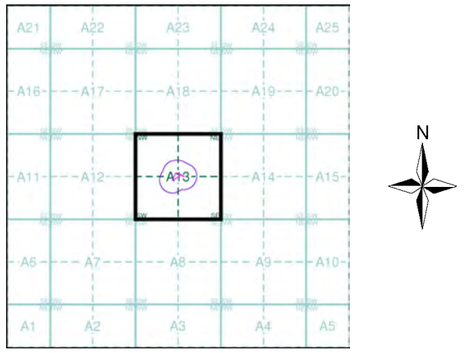
Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	308411552_1_1
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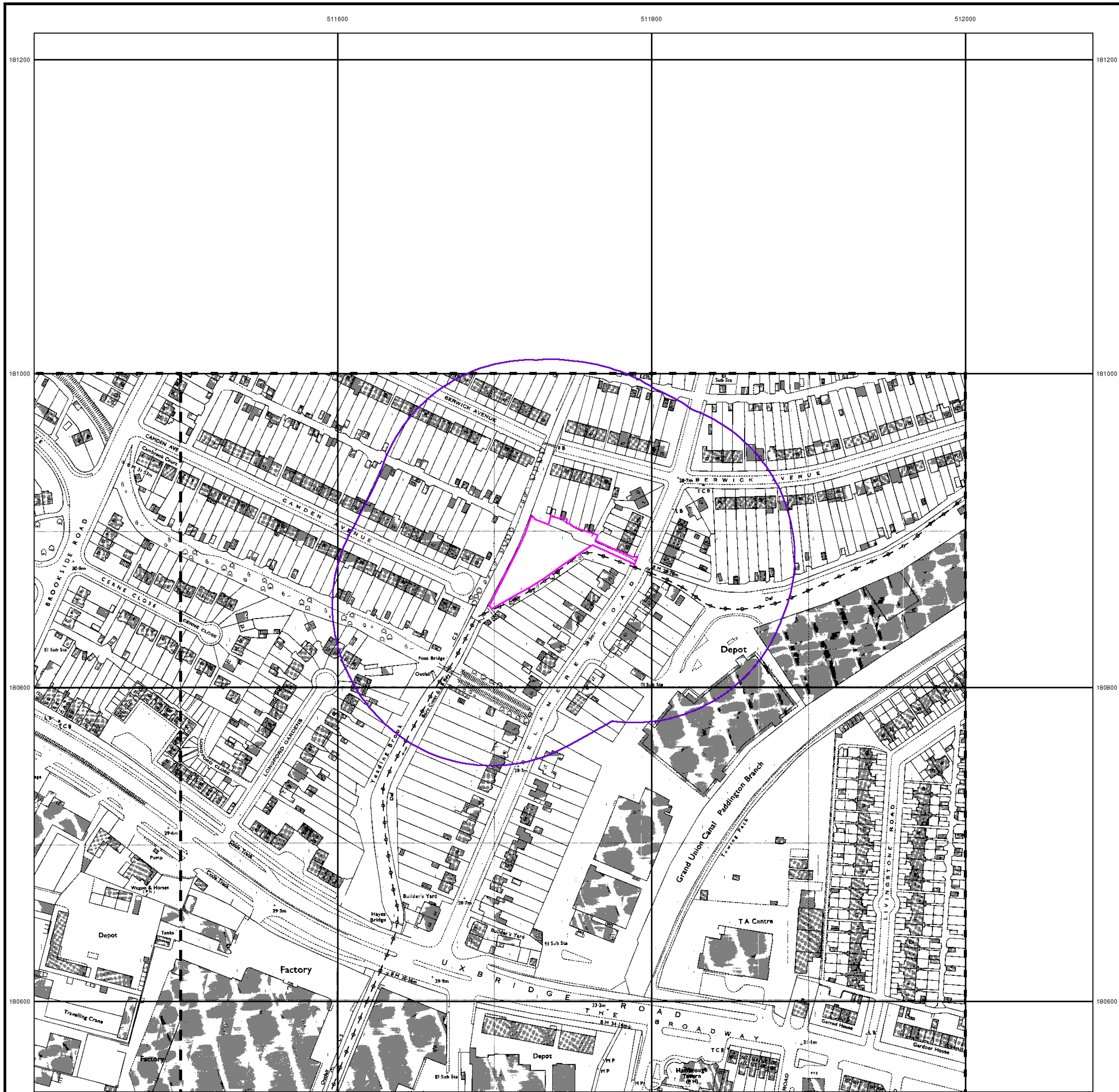


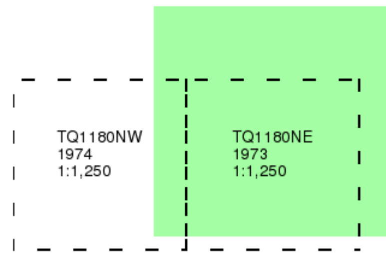
Ordnance Survey Plan

Published 1973 - 1974

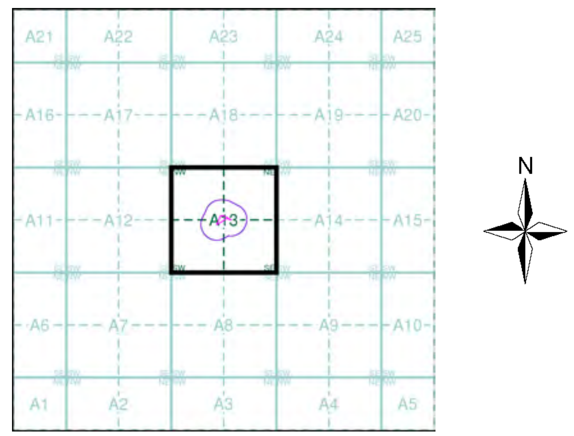
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 308411552_1_1
Customer Ref: BRD4241
National Grid Reference: 511740, 180880
Slice: A
Site Area (Ha): 0.18
Search Buffer (m): 100

Site Details

Rear of 12-26 Delamere Road, Hayes, UB4 0PW

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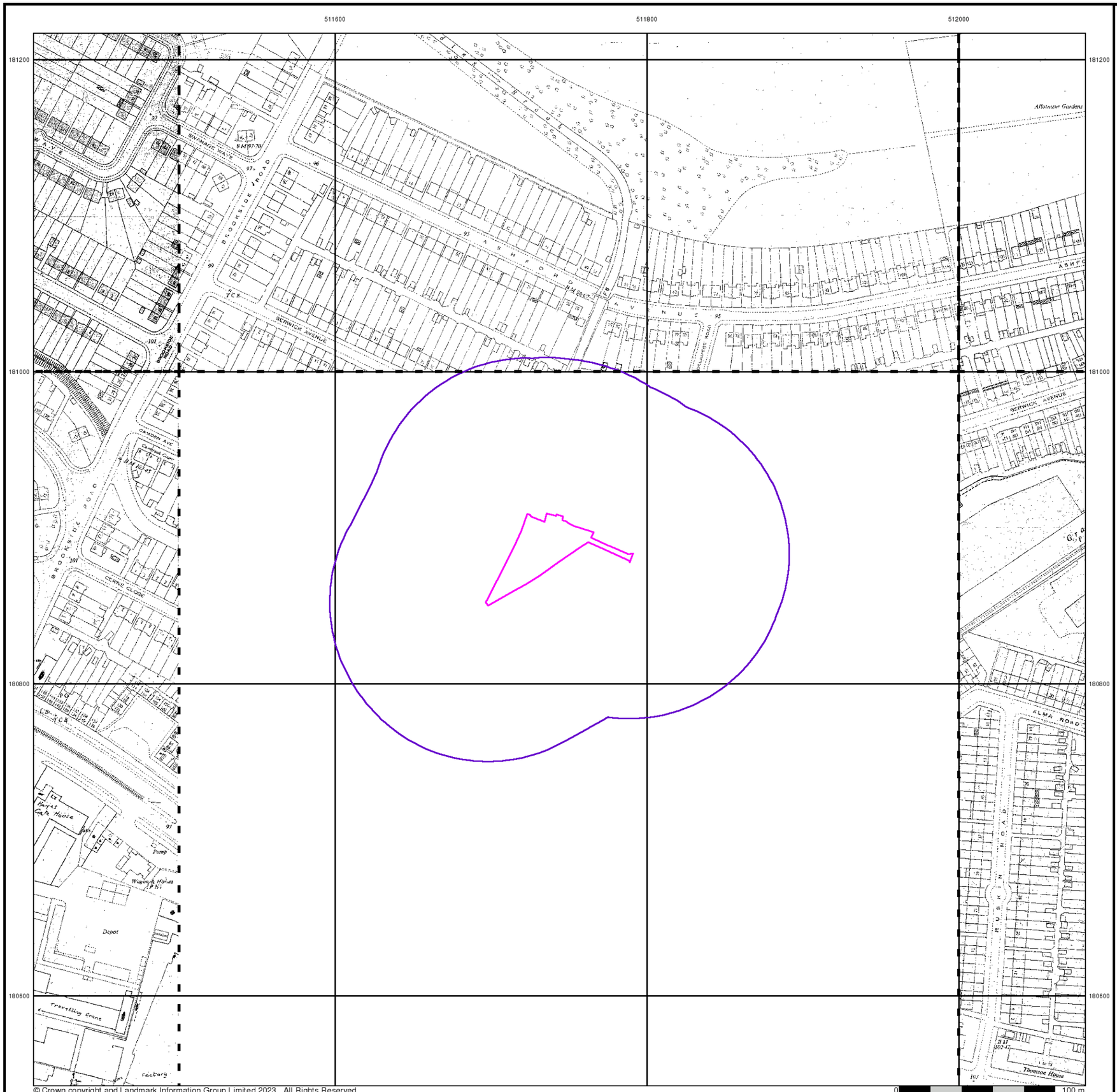


BRD

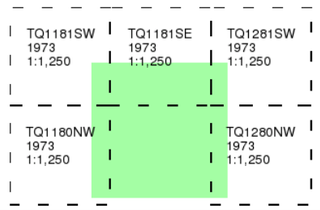
Supply of Unpublished Survey Information

Published 1973

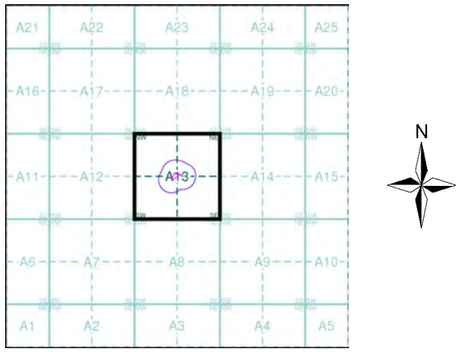
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

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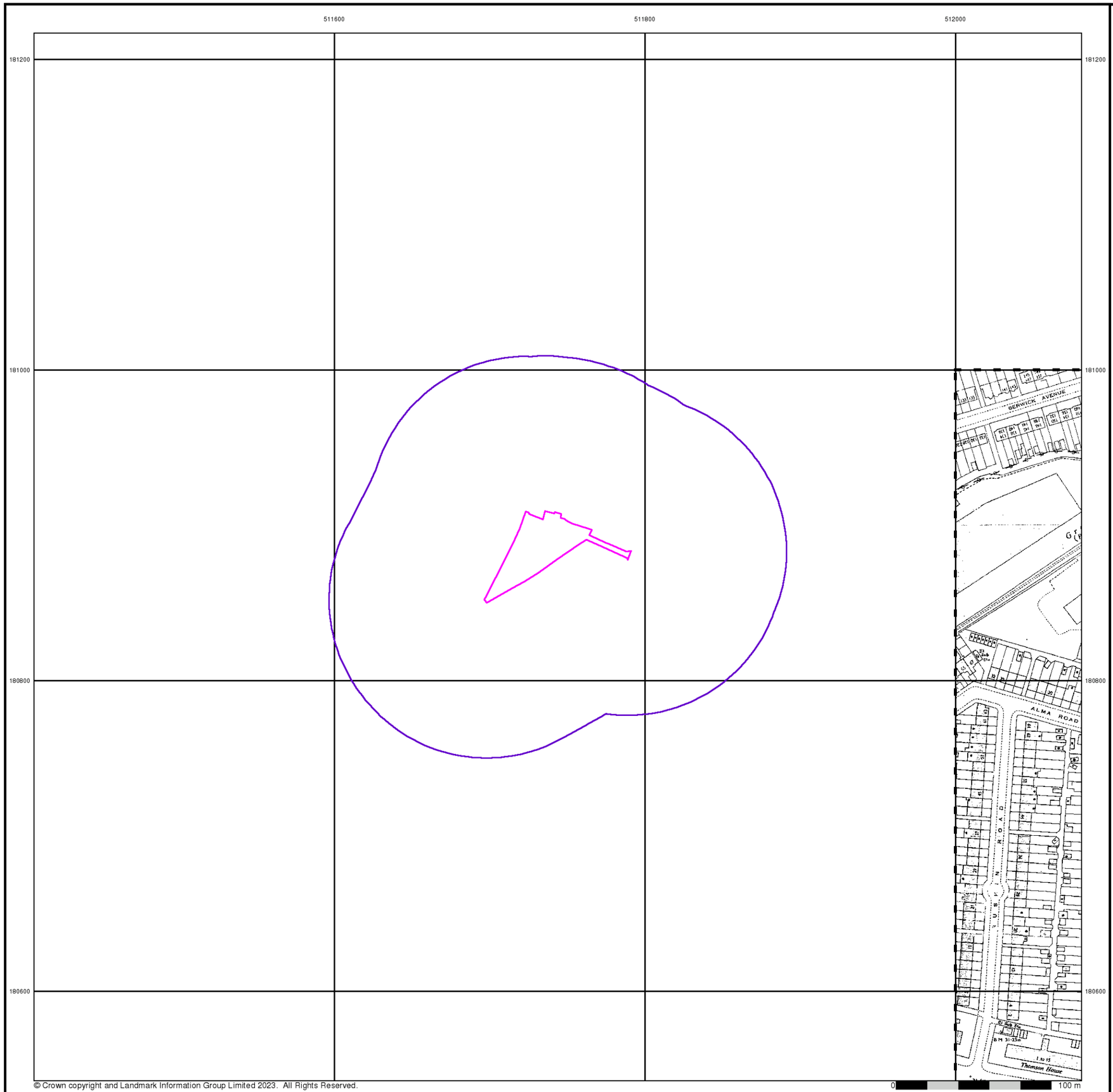


BRD

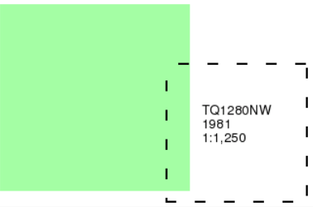
Additional SIMs

Published 1981

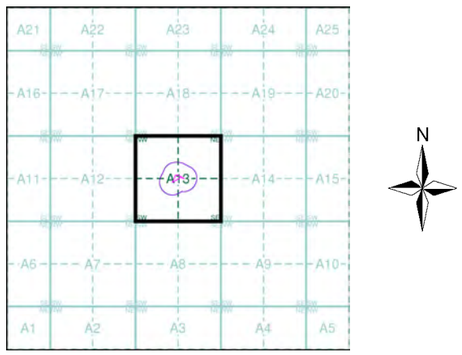
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



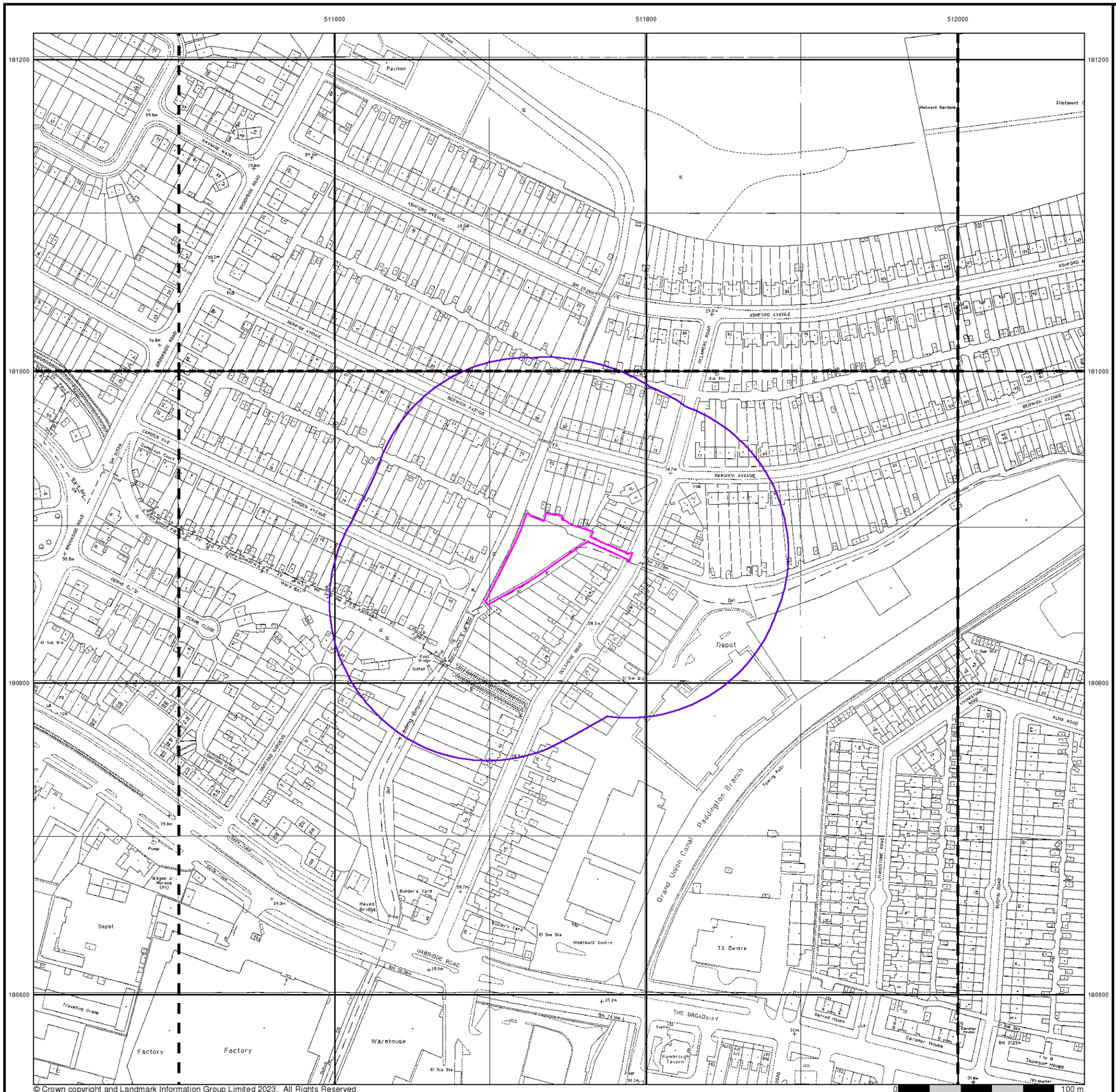
Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

Rear of 12-26 Delamere Road, Hayes, UB4 0PW

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



BRD

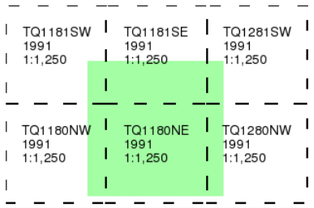
Large-Scale National Grid Data

Published 1991

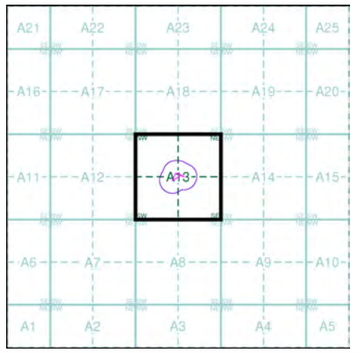
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



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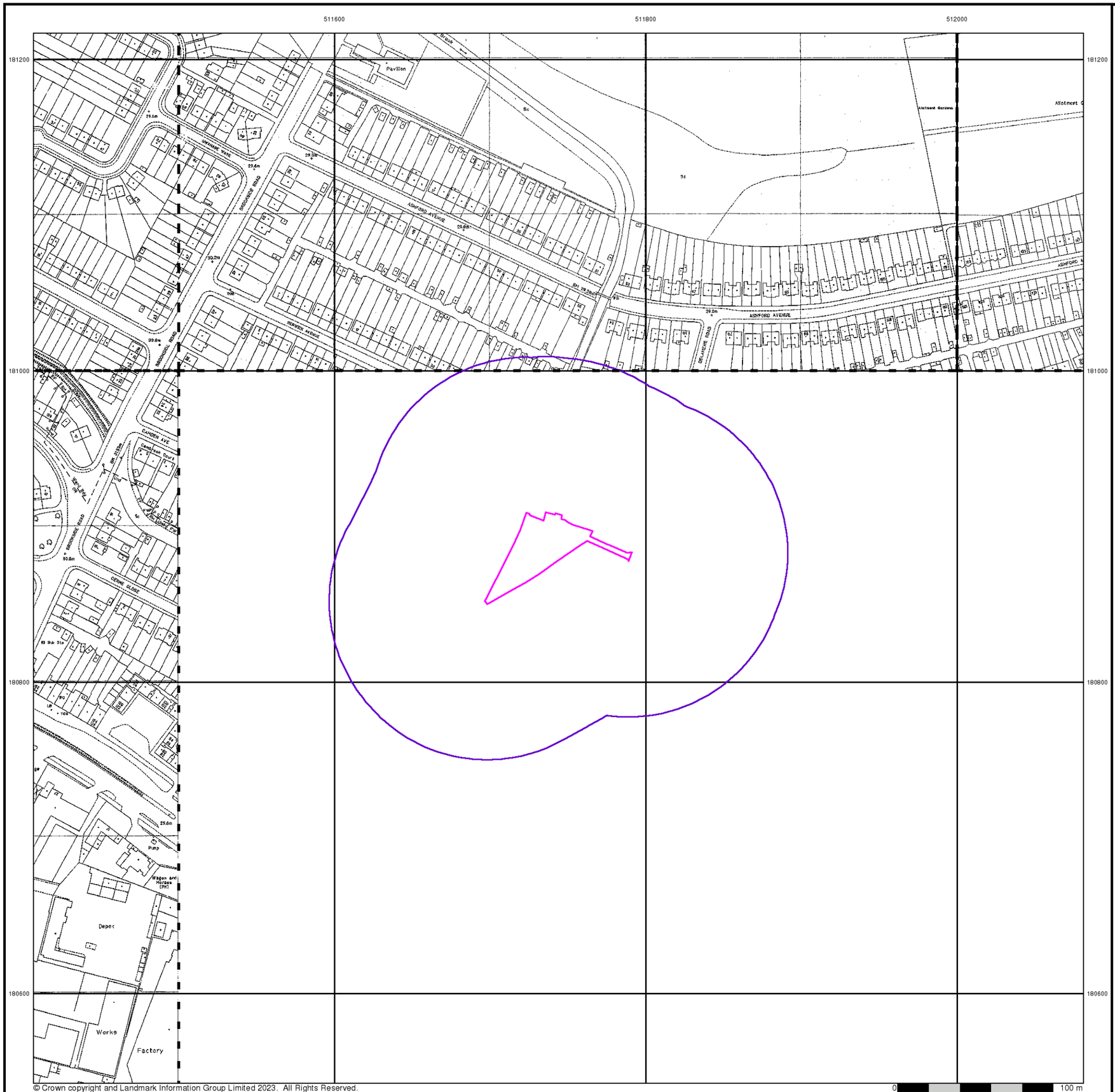

BRD

Large-Scale National Grid Data

Published 1993 - 1995

Source map scale - 1:1,250

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

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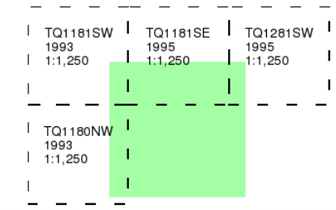
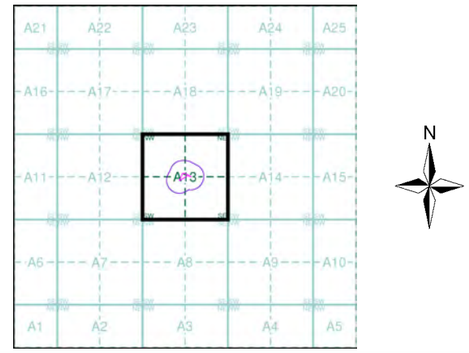


Historical Map - Segment A13



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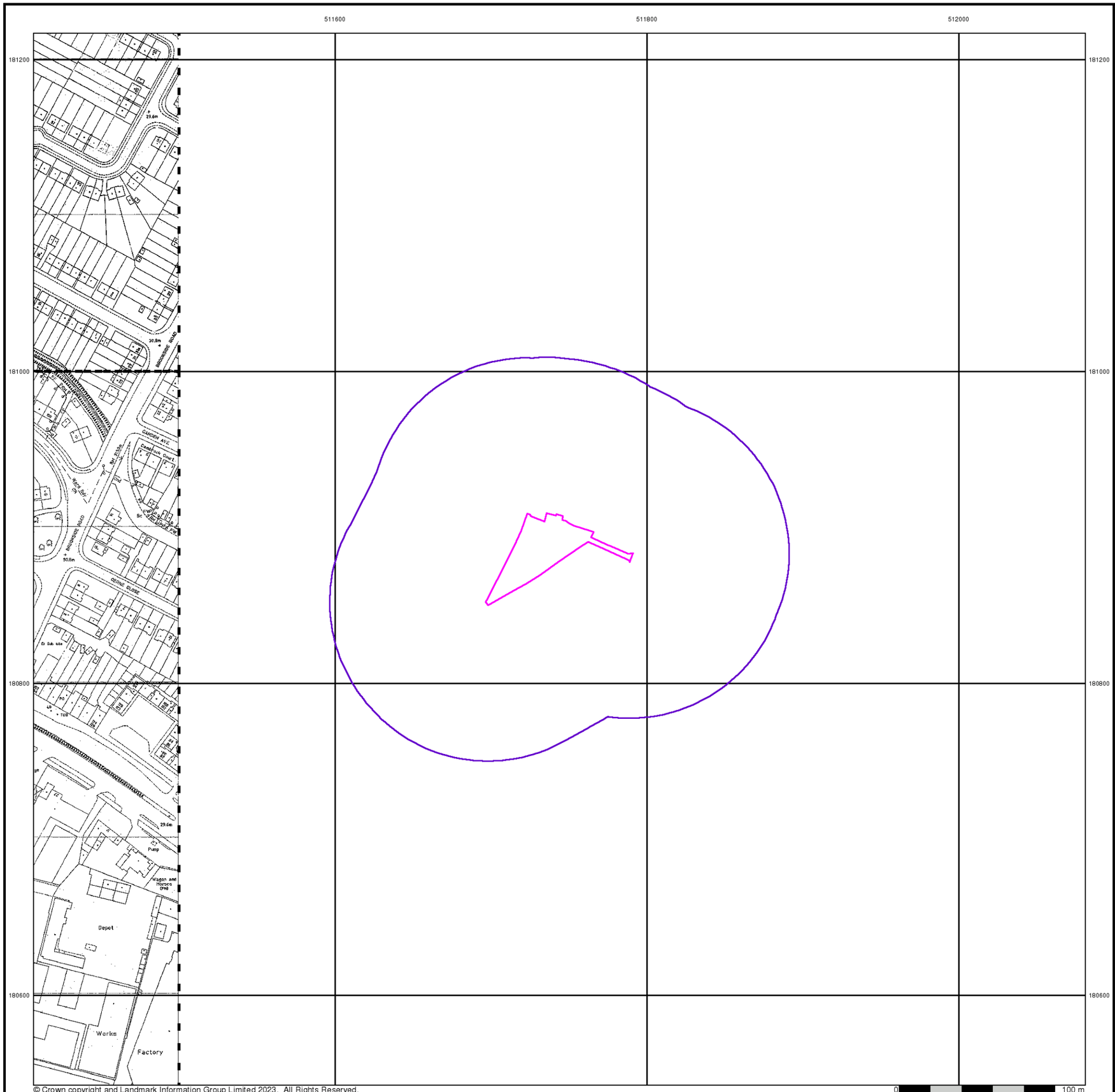

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Published 1993 - 1995

Source map scale - 1:1,250

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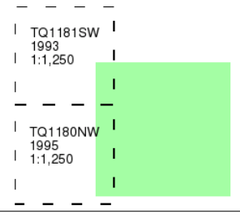
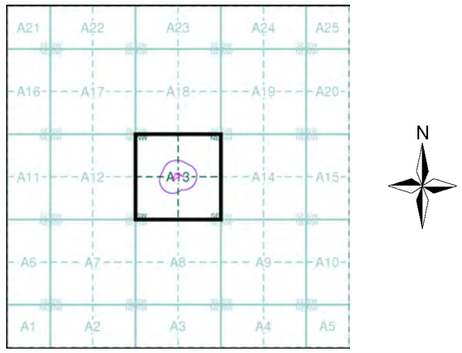


Historical Map - Segment A13



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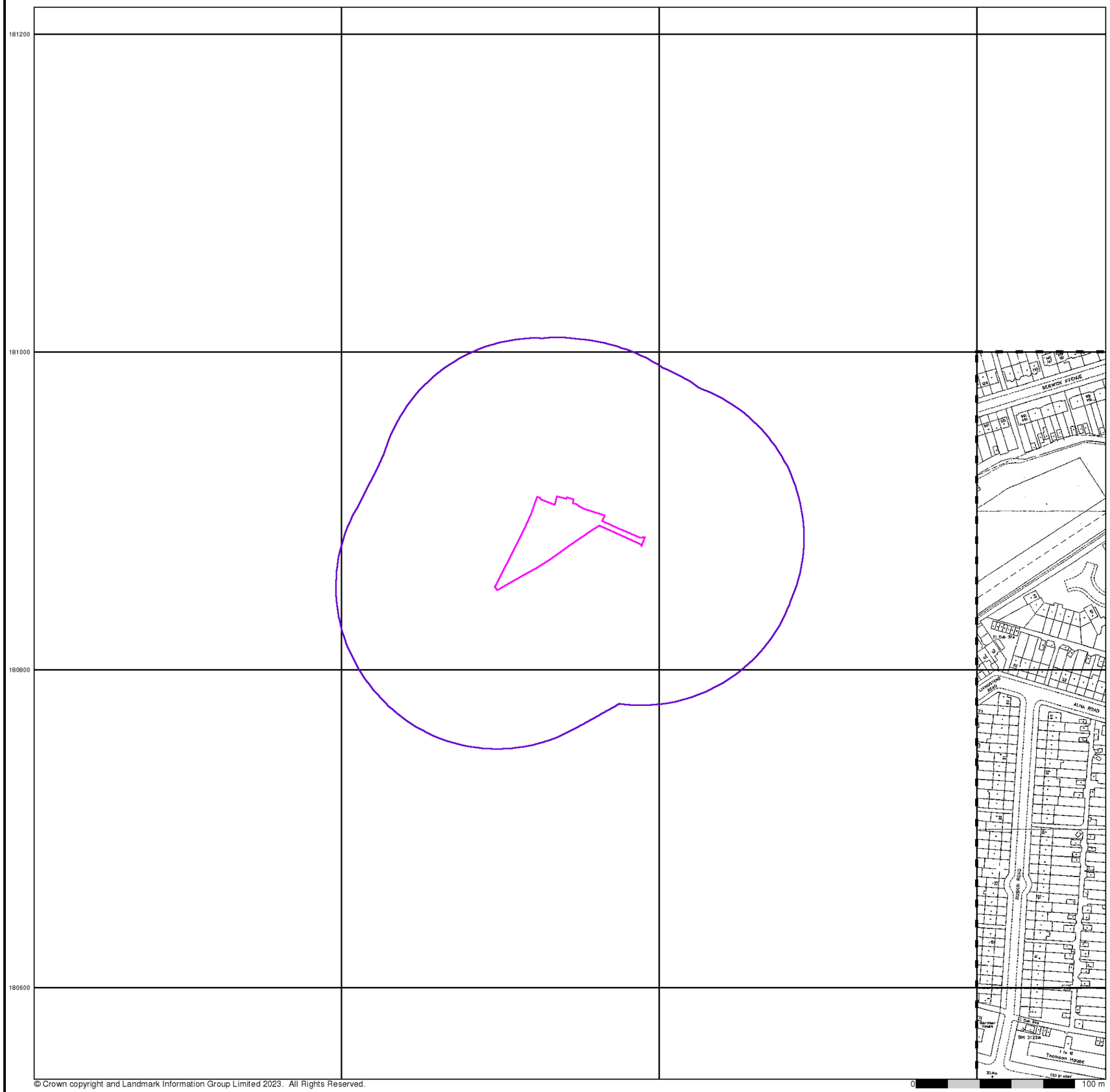

BRD

Large-Scale National Grid Data

Published 1996

Source map scale - 1:1,250

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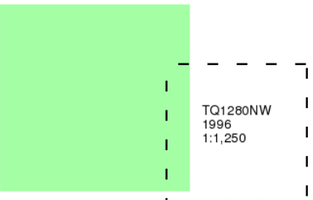
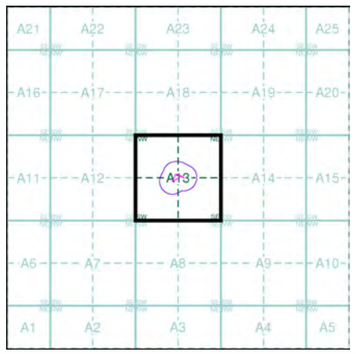


Historical Map - Segment A13



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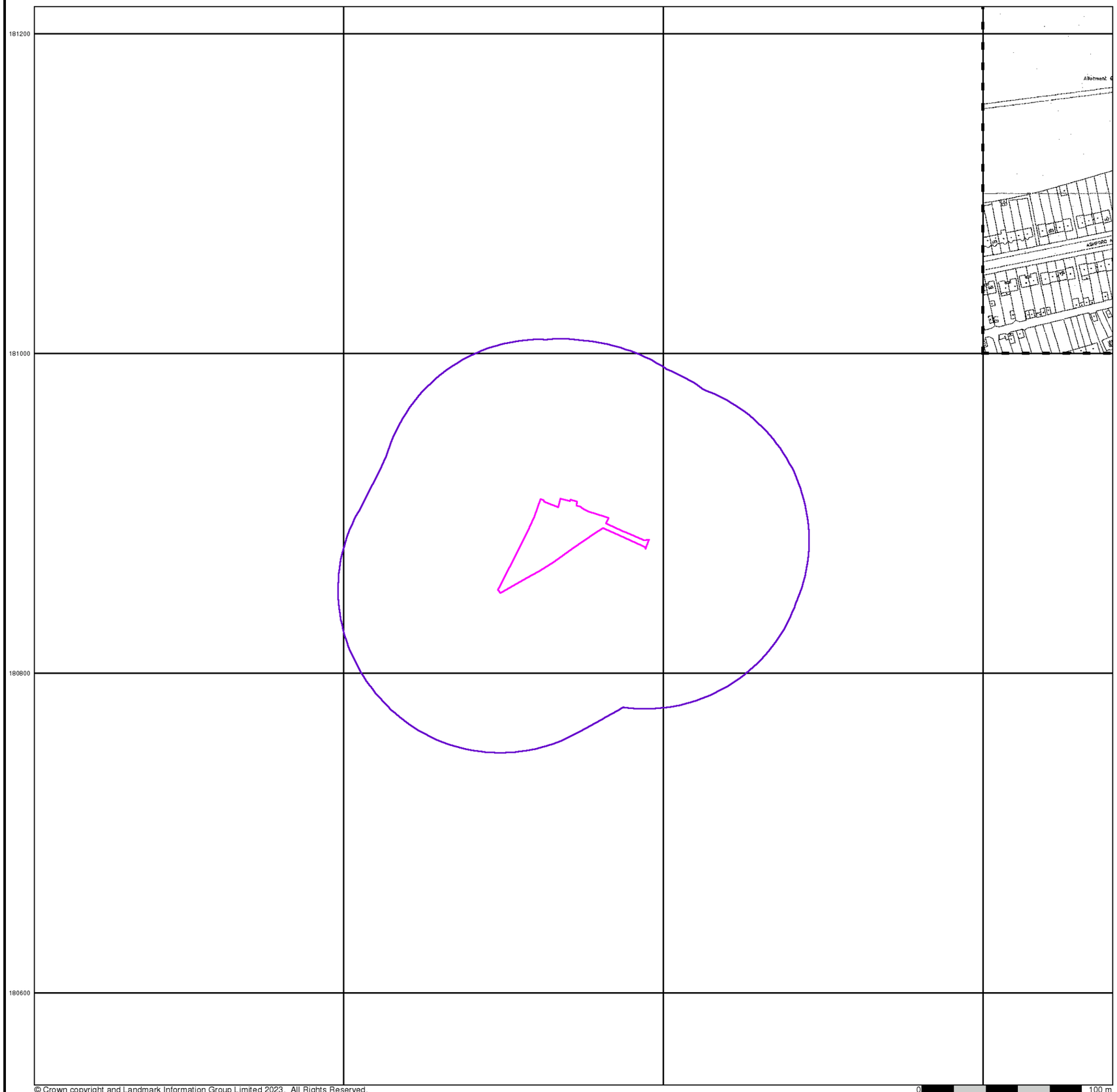

BRD

Large-Scale National Grid Data

Published 1996

Source map scale - 1:1,250

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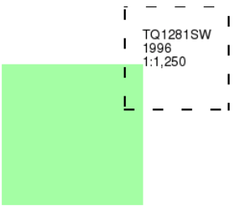
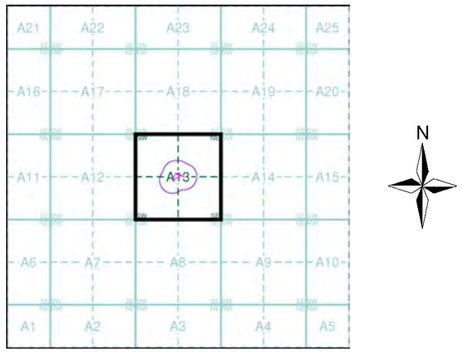


Historical Map - Segment A13



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Site Details

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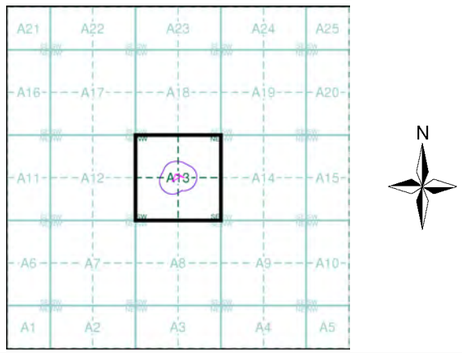
Web: www.envirocheck.co.uk

Historical Aerial Photography

Published 1999

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

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National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

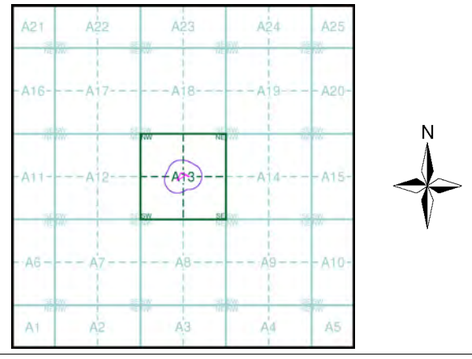
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

BRD

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:10,560	1868	3
Surrey	1:10,560	1871	4
Buckinghamshire	1:10,560	1881	5
Middlesex	1:10,560	1897	6
Middlesex	1:10,560	1919 - 1920	7
Middlesex	1:10,560	1935	8
Middlesex	1:10,560	1938	9
Middlesex	1:10,560	1938	10
Historical Aerial Photography	1:10,560	1948	11
Historical Aerial Photography	1:10,560	1948	12
Ordnance Survey Plan	1:10,000	1960	13
Ordnance Survey Plan	1:10,000	1966	14
Ordnance Survey Plan	1:10,000	1974 - 1975	15
Ordnance Survey Plan	1:10,000	1985	16
London	1:25,000	1985	17
Ordnance Survey Plan	1:10,000	1995	18
10K Raster Mapping	1:10,000	1999	19
10K Raster Mapping	1:10,000	2006	20
VectorMap Local	1:10,000	2022	21

Historical Map - Slice A



Order Details

Order Number: 308411552_1_1
Customer Ref: BRD4241
National Grid Reference: 511740, 180880
Slice: A
Site Area (Ha): 0.18
Search Buffer (m): 1000

Site Details

Rear of 12-26 Delamere Road, Hayes, UB4 0PW

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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Fireproof Building
- Prominent Fireproof Building
- Non-fireproof Building
- Non-fireproof Building (non-dwelling)
- Factory, mill, and flour mill, with chimneys
- Factory, mill, and flour mill, without chimneys
- Power Station, drawn to scale
- Hydroelectric Power Station
- Radio Station, drawn to scale
- Telephone Station, drawn to scale
- Abandoned Open-pit Mine or Quarry
- Open-pit Salt Mine
- Pit
- Oil Deposit or Well
- Oil Seepage
- Tailings Pile
- Fuel Storage Tanks
- Natural Gas Tank
- Bench Mark
- Drill Hole
- Burial Mound
- Triangulation Point on Burial Mound
- Single-track Railroad
- Double-track Railroad and Station Building
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Lawns
- Citrus Orchard
- Wet Ground
- Scattered Vegetation

243,8 — Values for prominent elevations

186.0 — Numbers for spot elevations, depth soundings, contour lines, etc.

0,2 — Velocity of the current, width of river bed, depth of river

Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (–)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Partly Demolished Buildings
- Demolished Buildings
- Built-Up Area with Fireproof Buildings Predominant
- Built-Up Area with Non-Fireproof Buildings Predominant
- Individual Fireproof Building
- Prominent Industrial Building
- Individual Dwelling, Fireproof
- Ruins of an Individual Dwelling
- Factory or Mill Chimney
- Factory or Mill with Chimney (*бум.*)
- Factory or Mill without Chimney (*скип.*)
- Mine or Open Pit Mine (*медн.*)
- Operating Shaft or Mine (*кам. уг.*)
- Non-Operating Shaft or Mine
- Salt Mine (*сол.*)
- Tailings Pile
- Pit (–1.7)
- Stone Quarry (*гл. пес. кам.*)
- Gas Pump or Service Station
- Fuel Storage or Natural Gas Tank
- Oil or Natural Gas Derrick
- Small Hydroelectric Power Station
- Power Station
- Transformer Station (*б.тр.*)
- Cemetery
- Burial Mound (height in metres) (+8.1)
- Triangulation Point on Burial Mound (95.7)
- Triangulation Point (92.6)
- Bench Mark (52.1)
- Bench Mark (monumented) (71.1)
- Telegraph Office
- Telephone Station
- Radio Station
- Radio Tower
- Airfield or Seaplane Base
- Landing Strip
- Main Highway (Cut, Fill, Km Post, Plantings, Telegraph/Telephone Lines)
- Highway under Construction
- Improved Dirt Road (former truck road) (Width of Road 6, Steep Grade)
- Double-track Railroad with First Class Station (Small Bridge, *cm.*, Pipe (Culvert), Tunnel)
- Dismantled Railroad
- Railroad Under Construction
- Shore Embankment
- River or Ditch with Embankment (+2.4)
- Direction and velocity of current (0.2, 135.1, Water Gauge, Water Level Mark)
- Well (*к. (г.-сол.)*)
- Water Reservoir or Rain Water Pit (*вдхр.*)
- Spring (156.2 *кл.*)
- Isobath with value (20)
- Heavy (Index) Contour Line
- Contour Line and Value (20)
- Half Contour Line
- Spot Elevation Value (347.1)
- Coniferous
- Deciduous
- Mixed
- Scrub

Key to Numbers on Mapping

TQ18_London

No.	Description
70	Factory (Cars)

BRD

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:10,560	1868	3
Surrey	1:10,560	1871	4
Buckinghamshire	1:10,560	1881	5
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Historical Aerial Photography	1:10,560	1948	12
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Ordnance Survey Plan	1:10,000	1966	14
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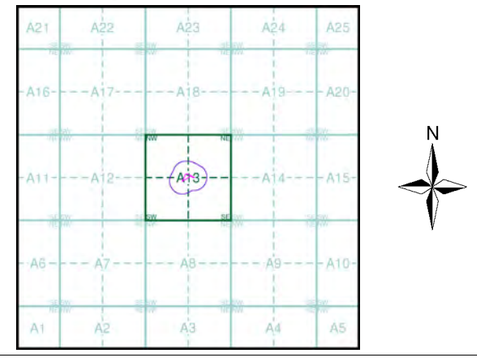
Ordnance Survey Plan	1:10,000	1995	18
10K Raster Mapping	1:10,000	1999	19
10K Raster Mapping	1:10,000	2006	20
VectorMap Local	1:10,000	2022	21

Russian Map - Slice A



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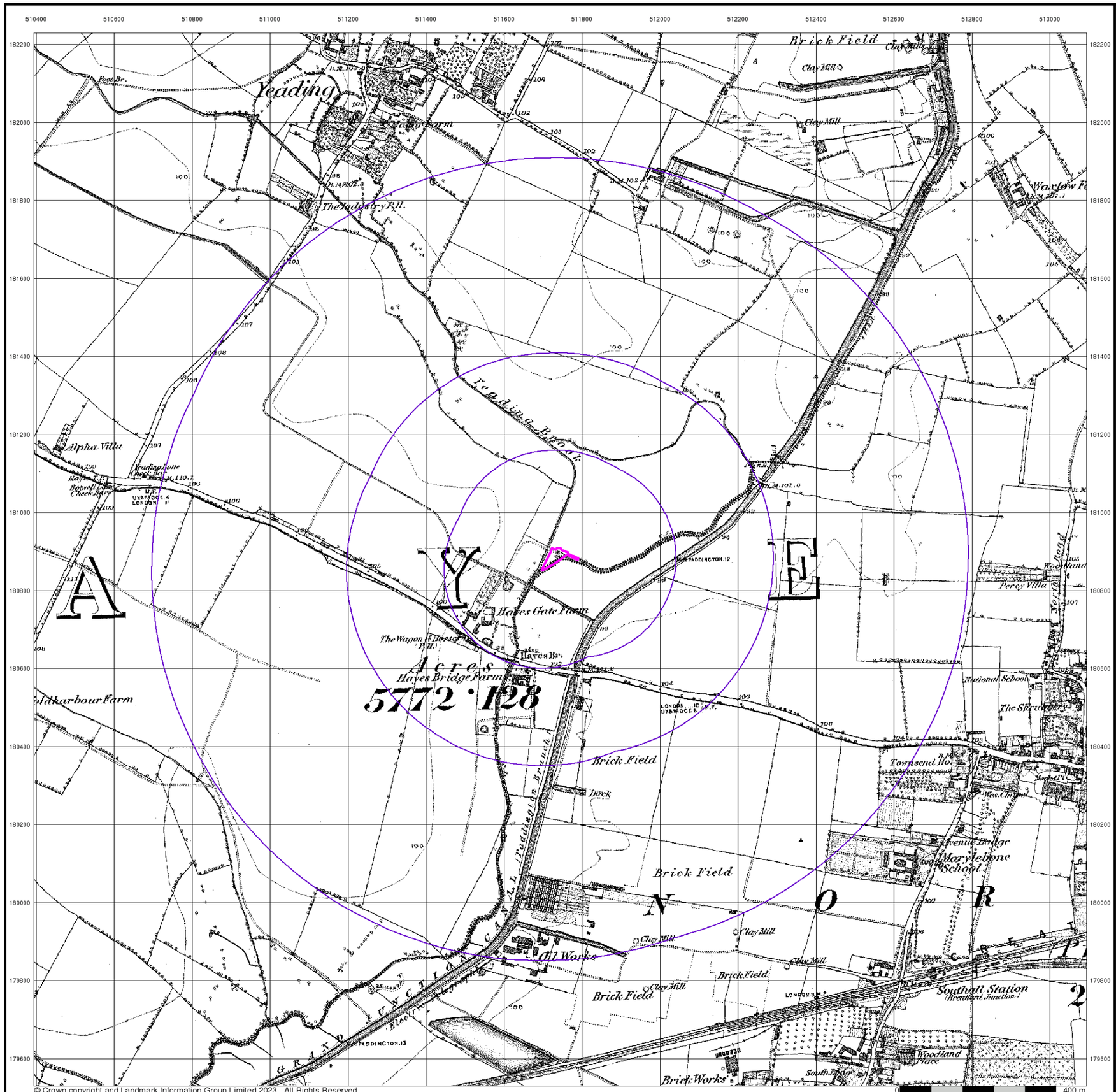


0 400 m

BRD

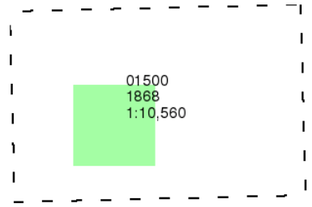
Middlesex

Published 1868

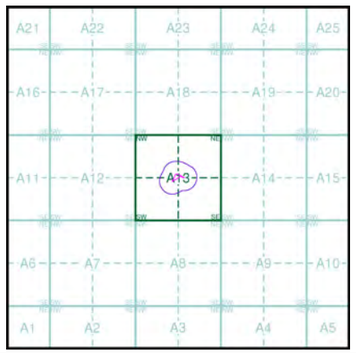
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



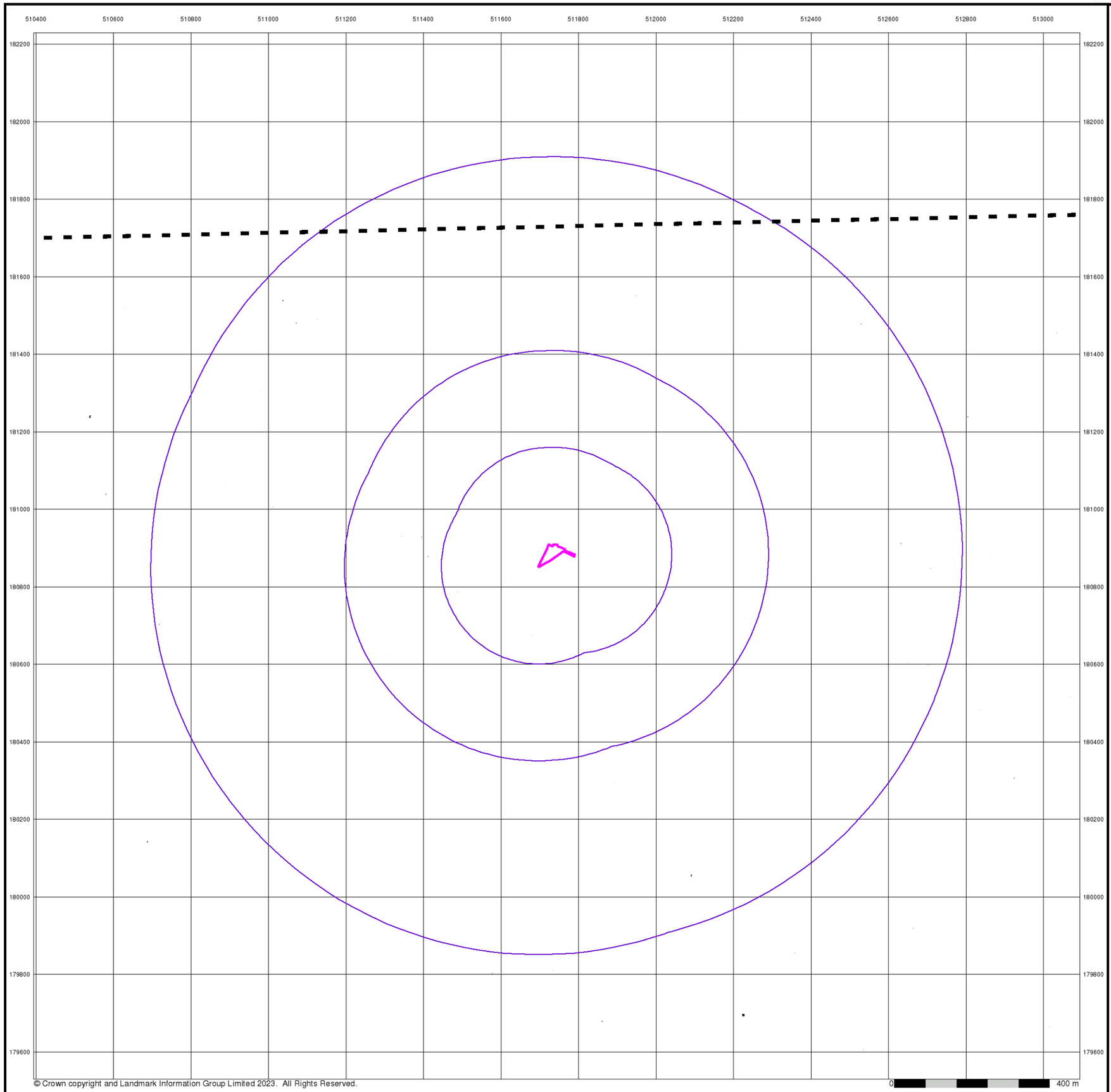
Order Details

Order Number:	308411552_1_1
Customer Ref:	BRD4241
National Grid Reference:	511740, 180880
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Rear of 12-26 Delamere Road, Hayes, UB4 0PW

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



BRD

Surrey

Published 1871

Source map scale - 1:10,560

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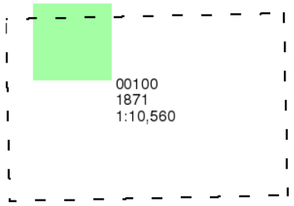
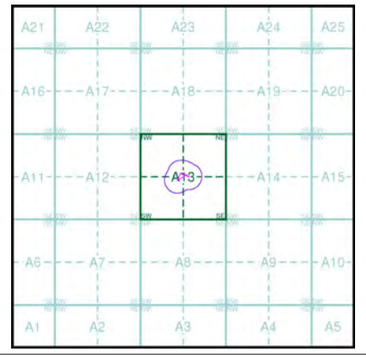


Historical Map - Slice A



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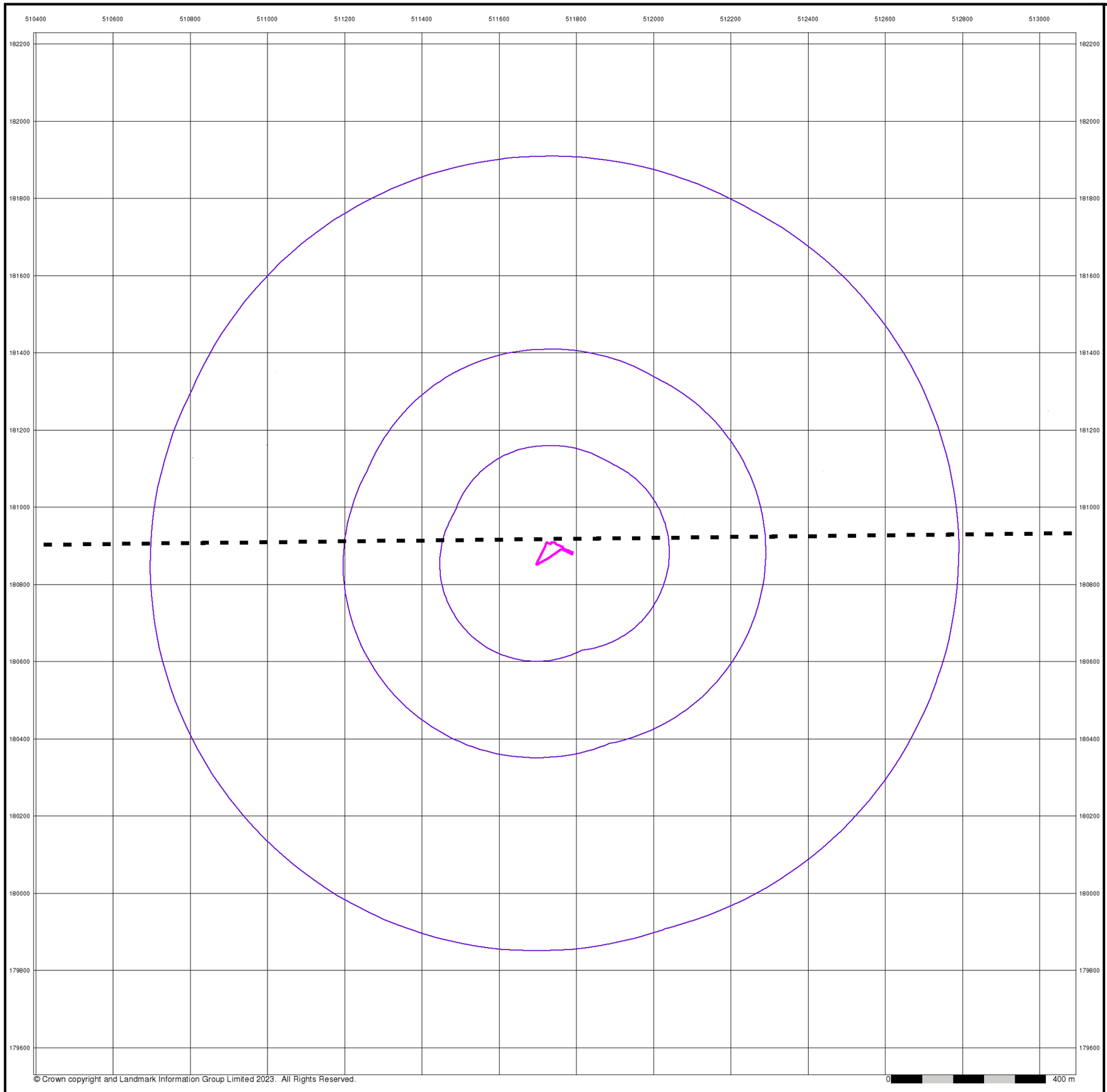

BRD

Buckinghamshire

Published 1881

Source map scale - 1:10,560

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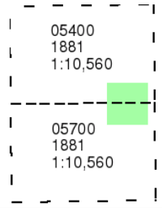
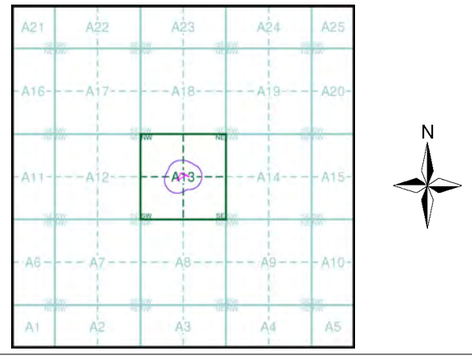


Historical Map - Slice A



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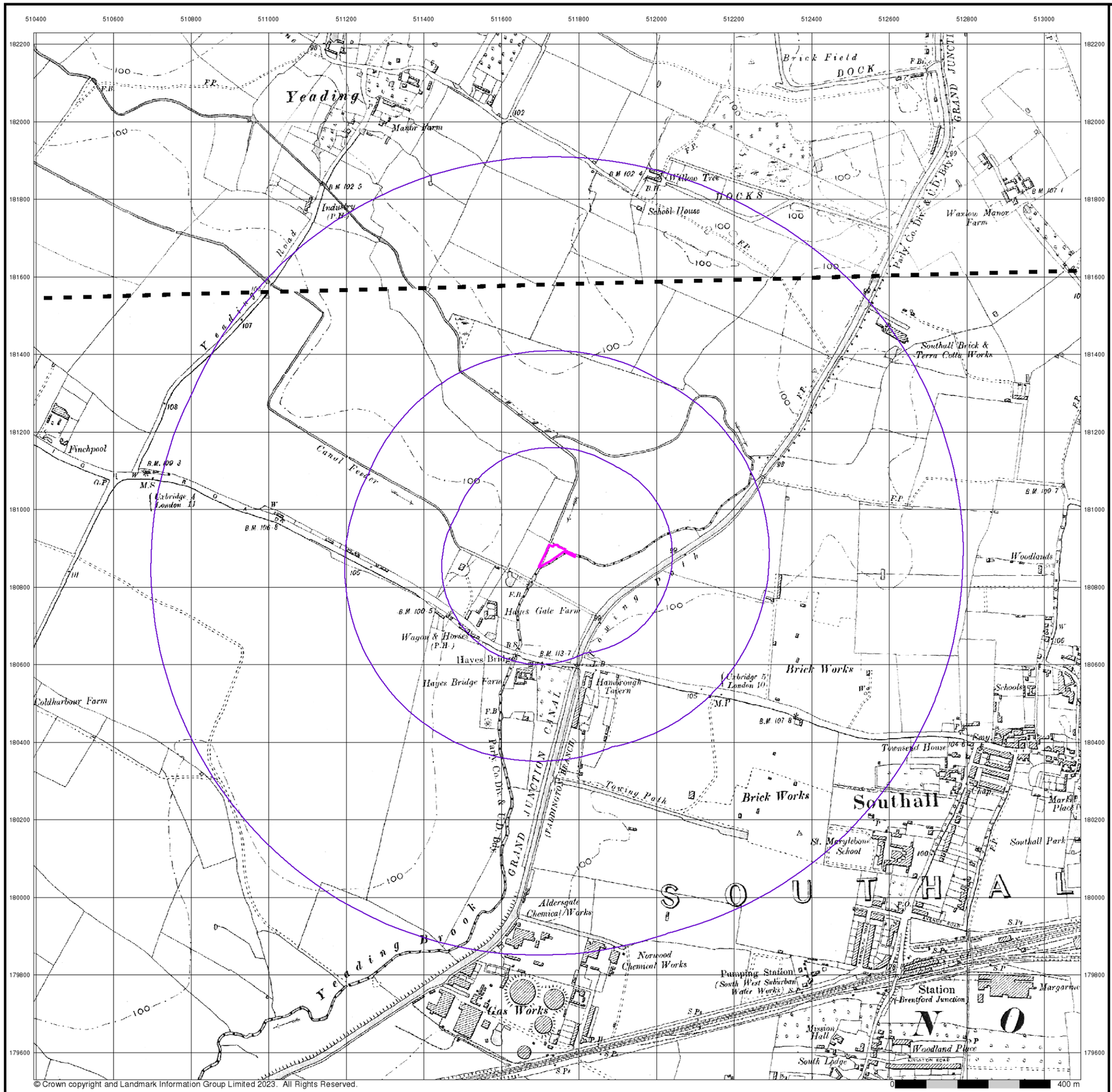

BRD

Middlesex

Published 1897

Source map scale - 1:10,560

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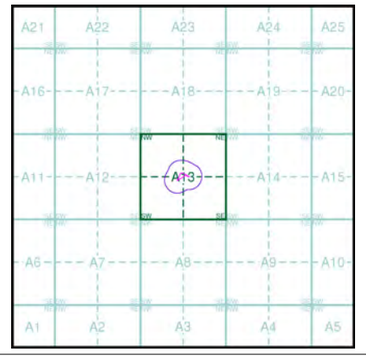
Map Name(s) and Date(s)

015NW
1897
1:10,560

015SW
1897
1:10,560

Historical Map - Slice A



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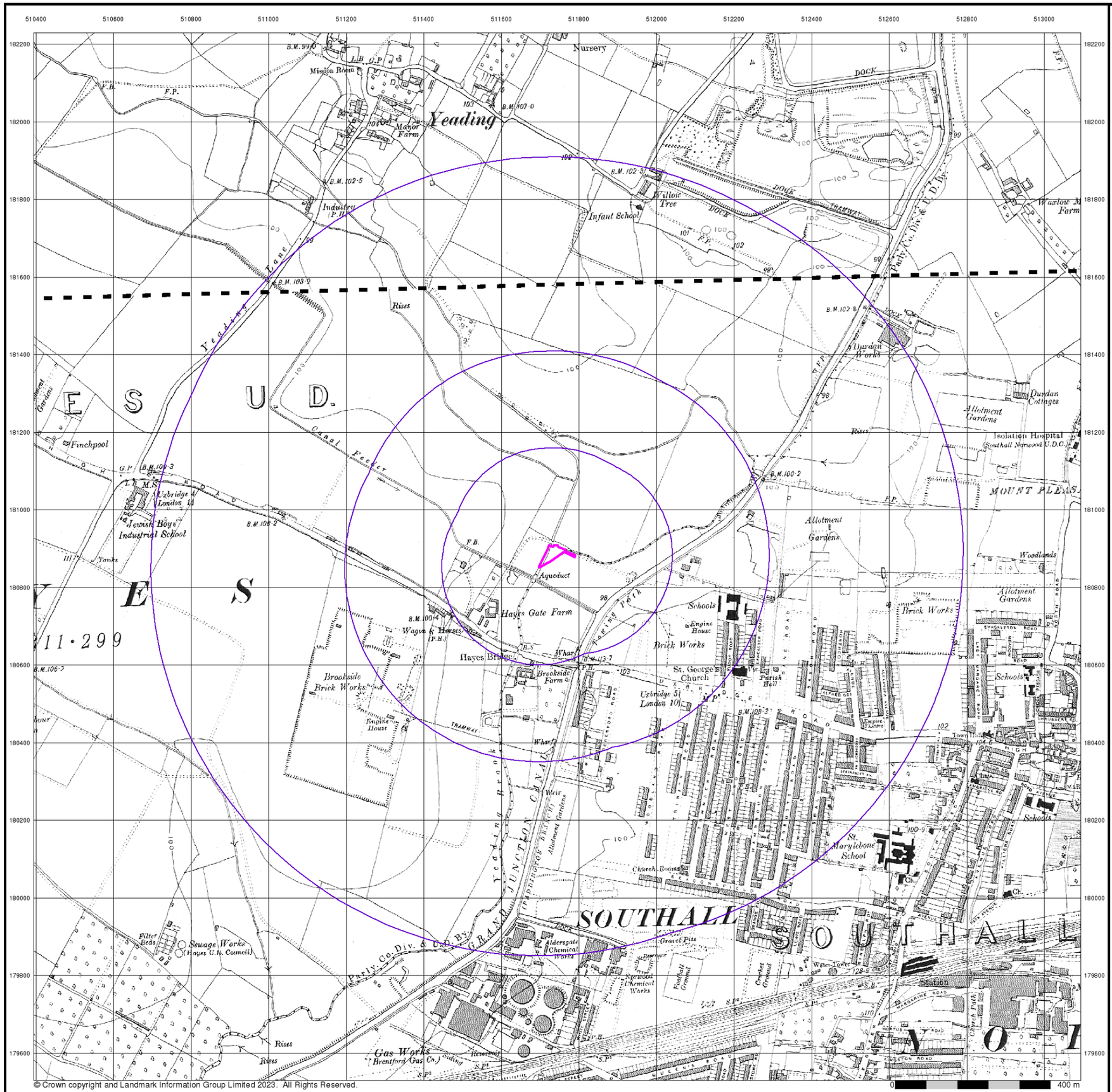

0 400 m

BRD

Middlesex

Published 1919 - 1920

Source map scale - 1:10,560

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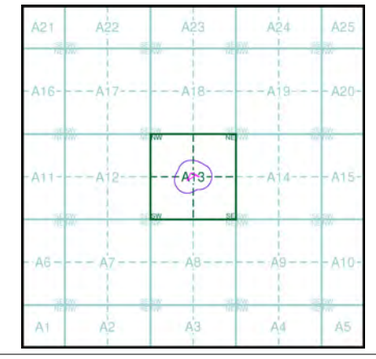
Map Name(s) and Date(s)

015NW
1919
1:10,560

015SW
1920
1:10,560

Historical Map - Slice A



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