Eastwood & Partners
CONSULTING ENGINEERS

GEOTECHNICAL AND GEO-ENVIRONMENTAL SITE INVESTIGATION REPORT

PHASE 3 LOWFIELD ROAD, BOLTON ON DEARNE,

FOR

GLEESON DEVELOPMENTS LIMITED

ISSUE 1



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Eastwood & Partners, St Andrew's House, 23 Kingfield Road, Sheffield S11 9AS
Tel: 0114 255 4554 Fax: 0114 255 4330 mail@eastwoodandpartners.com www.eastwoodandpartners.com

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PHASE 3 LOWFIELD ROAD, BOLTON ON DEARNE

FOR

GLEESON DEVELOPMENTS LTD

ISSUE 1

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P. Richardson

Also at:- Principle House, 121-123 Fleet Road, Fleet, Hampshire, GU51 3PD Tel: 01252 360580 Fax: 01252 360581

Directors: **P Richardson** BSc, CEng, MICE, MIStructE **S D Preston** BEng, CEng, FICE, FIStructE **N J Baines** BSc, CEng, MICE, MCIWEM
M J Yates BSc(Eng), ACGI, CEng, MICE, FIStructE
S R Ellis, BEng, CEng, MIStructE, AMICE **K R Pursall** BEng, CEng MIStructE
Senior Associates: **K Newsome** BSc, CEng, MICE, MIStructE **S J Mitchell** BSc, MSc, CEng, MEI, MCIBSE, MASHRAE
Associates: **A Jones** BEng, CEng, MICE, MIStructE **M Young** MA, CEng, MICE, MIStructE **A Allison** B.Eng **C A Wood** BSc, CEng, MIStructE, AMICE
C A Topliss BSc, CEnv, CSci, CGeol, AMICE, FGS **S J English** BEng, CEng, MIStructE **A R Priest** BEng
Consultants: **G M Seaman** BSc, CEng, FICE, FIStructE **J M Wood** BSc, CEng, MICE, FIStructE

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CONTENTS

1.0 EXECUTIVE SUMMARY 4

2.0 INTRODUCTION 5

2.1 Terms of Reference 5
2.2 Context 5
2.3 Aims and Objectives 5
2.4 Scope of Investigation 5
2.5 Limitations of Investigation 7

3.0 THE SITE 8

3.1 Description 8
3.2 History 8
3.3 Geology 9
3.4 Hydrogeology 9
3.5 Hydrology 9
3.6 Mining 10
3.7 Ground Gas 10
3.8 Pollution Incidents to Controlled Waters 11
3.9 Discharge Consents 11
3.10 Flooding 11

4.0 OUTLINE CONCEPTUAL MODEL 12

4.1 Possible Significant Pollutant Linkages 12

5.0 GROUND INVESTIGATION 13

5.1 Site Works 13
5.2 Laboratory Testing 13

6.0 GROUND CONDITIONS 14

6.1 Surface Covering 14
6.2 Made Ground 14
6.3 Natural Ground 14
6.4 Obstructions 14
6.5 Groundwater 14
6.6 Evidence of Contamination 14

7.0 GEOTECHNICAL APPRAISAL 15

7.1 General 15
7.2 Foundations 15
7.3 Ground Slabs 15
7.4 Superstructure Precautions 15
7.5 Excavation Problems 15
7.6 Roads 16
7.7 Surface Water Drainage 16

8.0 REFINEMENT OF OUTLINE CONCEPTUAL MODEL 17

8.1 Source Characterisation 17
8.2 Gas Precautions 17
8.3 Unexpected Contamination 17
8.4 Chemical Testing 17
8.5 Assessment Criteria 18
8.6 Chemical Test Results 18

9.0 RISK ASSESSMENT 19

9.1 Human Health: Future Residents and Visitors 19
9.2 Human Health: Construction Workers 19
9.3 Plants 19
9.4 Concrete 19
9.5 Controlled Waters 19
9.6 Disposal of Material 19

10.0 CONTAMINATION - RECOMMENDATIONS AND APPROVALS 20

APPENDICES

Appendix 1 *'Exploratory Hole Location Plan'*, Drawing Number 37666/006/A

Appendix 2 Envirocheck Report

Appendix 3 Trial Pit Logs TP1 to TP15 and Soakaway Pit Logs SA1 to SA4

Appendix 4 Infiltration Test Results

Appendix 5 Chemical Testing Results, Chemtech Report 53074(1)

Table of Assessment Values

1.0 EXECUTIVE SUMMARY

1. The site has an area of approximately 2.6 hectares and is located south of Lowfield Road, at Bolton On Dearne. The site is centred on National Grid Reference 446090, 402390 and comprises an undeveloped field.

2. The surface was covered with around 0.3 m of dark brown clayey sandy topsoil overlain by grass. No made ground was encountered on site. The natural ground comprises brown and light brown fine to coarse brown gravelly sand, occasionally clayey, to depths of between 0.5 m and 2.2 m bgl, over moderately strong sandstone, which was recovered as gravel and cobbles in a sand matrix.

3. For the low rise housing scheme proposed, the most suitable foundations are considered to be unreinforced strip or trench fill footings taken through any soft ground at a minimum depth of 750 mm below ground level. If competent sandstone is encountered at shallower depths, no further excavations are required.

4. Variable infiltration rates were recorded. Soakaways are not considered to be a viable solution for surface water drainage.

5. Service records show an underground electric cable and a gas pipe to cross the site from the north west to the south east. Strong rock is also expected at shallow depth.

6. Significant contamination was not encountered in the materials tested. Remedial measures are not considered necessary. The topsoil can be considered suitable for re-use.

7. DS-1 AC-1 sulphate precautions are appropriate for the below ground concrete on the site.

8. The conclusions made in this report in relation to contamination are subject to agreement by the approving bodies such as the Local Authority and your warranty provider.

2.0 INTRODUCTION

2.1 Terms of Reference

This report presents the findings of a geotechnical and geo-environmental site investigation carried out by Eastwood & Partners (Consulting Engineers) Ltd for, and on the behalf of Gleeson Developments Ltd. Any other parties using the information in this report do so at their own risk and any duty of care is excluded.

2.2 Context

No previous geotechnical or geo-environmental investigations are known to have been undertaken on the site in the past.

2.3 Aims and Objectives

The aims and objectives of this investigation were as follows:

- Assimilate Phase 1 data to derive an outline conceptual model identifying potential contaminants, pathways and receptors, as well as possible linkages between these;
- Obtain information enabling refinement and subsequent testing of the conceptual model;
- Carry out tiered risk assessment to establish the likely risks to future receptors, involving the use of generic assessment criteria and where unacceptable risks are identified, site specific assessment criteria within a detailed quantitative risk assessment;
- Identify feasible remediation options if unacceptable risks are highlighted;
- Develop an appropriate remediation strategy where remediation is required; and
- Detail the ground conditions and their geotechnical properties enabling outline foundation proposals to be made.

2.4 Scope of Investigation

This document is split into two sections. These constitute the findings of the Phase 1 and Phase 2 investigations, consecutively.

2.4.1 Phase 1

The Phase 1 investigation involved a review of information extracted from published documentation as well as that obtained from a site reconnaissance. Information regarding the current and former land uses both on and surrounding the site, as well as the environmental sensitivity of the site location as determined by factors including geology, hydrogeology and hydrology have been examined.

Information analysed in this section of the report has been obtained from a variety of sources and included the following:

- A Landmark Envirocheck Report. This includes historical Ordnance Survey maps, as well as information regarding environmental issues such as abstraction licenses, pollution incidences and waste facilities;
- Coal Authority Report;
- British Geological Survey maps and memoirs;
- A site walkover.

The results of the Phase 1 investigation were used to derive an outline conceptual model from which a preliminary risk assessment was made.

2.4.2 Phase 2

This part of the investigation consisted of intrusive works and laboratory analysis. The findings were used to test the conceptual model and produce a final risk assessment.

The intrusive works comprised trial pits which were excavated to enable:

- Examination of the upper few metres of ground;
- In situ description of soils, enabling any localised lateral and vertical changes in soil conditions to be logged;
- Assessment of any contamination identified using visual and olfactory methods;
- Collection of soil samples for chemical testing;
- Infiltration tests to be undertaken.

2.5 Limitations of Investigation

This report is based on the assumption that the site will be developed with houses up to three storeys in height, with private gardens. These will be of conventional construction and existing ground levels will not alter significantly. If this is not the case, then the advice given in this report may not be appropriate.

Where assessments of site areas affected in particular ways are given, these are approximate. All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, on the results of laboratory testing carried out as part of the investigation and information gained from a geological and historical desk study. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata and water conditions between or below investigation points. It should be noted that groundwater varies due to seasonal or other effects, and may at times differ from this measured during the investigation.

3.0 THE SITE

3.1 Description

The site has an area of approximately 2.6 hectares and is located south of Lowfield Road, at Bolton Upon Dearne. The site is centred on National Grid Reference 446090, 402390 and comprises an undeveloped field.

The '*Exploratory Hole Location Plan'*, drawing 37205/006/A in Appendix 1, shows the features described.

3.2 History

Historical maps, obtained as part of the Envirocheck Report, have been reviewed to assess the previous use of the site and surrounding area. Copies of the maps are presented in Appendix 2.

3.2.1 The Site

The earliest historical map, dated from 1851 to 1855, indicates the site to comprise agricultural land with a field boundary that trends north east to south west across the centre of the site. By 1962 the field boundary has been removed. The site has remained undeveloped to the present day.

3.2.2 The Surrounding Area

The earliest historical map reviewed, dated from 1851 to 1855, records the surrounding area to be predominantly agricultural fields. Lowfield Lane runs approximately north west to south east around 50 m north of the site. At its closest, the River Dearne lies approximately 110 m from the site's southern boundary and flows towards the east/south east. The town of Bolton Upon Dearne lies around 300 m to the west of the site.

By 1893, the Midland and North-Eastern Railway line has been constructed approximately 160 m west of the site, running north to south.

In 1903, sewage works are labelled on the map, just east of the railway line, about 110 m south west of the site. Between 1903 and 1907, an old clay pit can be observed around 550 m north east of the site. The sewage works have expanded by 1930, and now located approximately 25 m from the south western corner of the site. Residential buildings and allotment gardens have also been constructed along the northern side of Lowfield Lane.

In the subsequent years, residential development has continued in the wider surrounding area.

In 1976, a factory has been constructed on the adjacent land about 150 m west of the site. By this time the original course of the River Dearne has been straightened. An embankment runs along the north side of the river channel, southeast of the site.

Between 2006 and 2014, the Lowfield Lakes complex has been constructed immediately south of the site. By the present day, the factory west of the site has been demolished and the area of the disused tips has been developed as parks and woodland.

3.3 Geology

The Geological Map Sheet 283 NE (1;10560 scale) shows the site to overlie Middle Coal Measures strata, comprising mainly interbedded mudstones and sandstones. The strata are anticipated to dip to the north east at less than 5°.

Faults are present within the Barnsley coal seam at depth but should not affect the development.

No superficial deposits are shown to overlie the site.

BGS borehole records have been reviewed for the local area. One historical borehole is located within the site, reference SE40SE64. This records around 45 feet (14 m) of Mexborough Rock sandstone, with a coal seam 0.75 m thick around 14 m below the base of the sandstone.

3.4 Hydrogeology

3.4.1 Groundwater Vulnerability

The Envirocheck Report states that the site overlies a Secondary A Aquifer, comprising 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.

3.4.2 Water Abstractions

The Envirocheck Report indicates there are no groundwater abstractions within 250 m of the site.

3.5 Hydrology

The Envirocheck Report indicates that the nearest surface water feature is 13 m south west of the site. This is expected to refer to the Lowfield Lakes complex.

According to the Envirocheck Report, the site is not located within a Groundwater Source Protection Zone.

3.6 Mining

From the BGS borehole information, the site is expected to lie towards the base of Mexborough Rock. The shallowest named coal seam is therefore expected to be the Double Smuts coal, found in the BGS borehole to lie around 14 m below the base of the Mexborough Rock and 28 m below site. The seam was found to be 0.75 m thick. The geological memoir does not suggest that the seam is of good quality and it does not refer to it having been worked in the area. Even if the seam was worked, it is expected to lie at a depth at which grouting is not required. Precautions against the effects of shallow mining are therefore not considered necessary.

A Coal Authority report has been obtained and is enclosed in Appendix 2. This states that the site is within the likely zone of influence from workings in five seams of coal at 220 m to 690 m depth, and last worked in 1972. Any ground movement from these coal workings should have stopped by now.

The site is not within the likely zone of influence from any present or future underground coal workings, however, reserves of coal exist in the locality which could be worked at some time in the future subject to feasibility, licences and planning consents. There are no recorded mine shafts or entries within 20 m of the site boundary, although the Coal Authority records may not be complete. The Coal Authority Report states there is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property

The Coal Authority Report also states the site is within an area for which entitlement to withdraw support was published in 1942 and 1982. This has not yet been revoked, however, it is unlikely that underground seams will be mined further in the future, mainly due to the site's location in a built up area.

3.7 Ground Gas

The Envirocheck Report states that the site is in an intermediate probability radon area, as between 1 and 3% of homes are above the action level. However, the Envirocheck Report indicates that the site lies in an area where no radon precautions are required.

The Envirocheck Report indicates that the site is not within 500 m of an active or historic landfill. Deep made ground is not expected across the site, as there is no evidence of past development. Ground gas precautions are not considered necessary.

3.8 Pollution Incidents to Controlled Waters

The Envirocheck Report indicates there are six pollution incidents to controlled waters within 250 m of the site boundary. One was classified as a major incident. It occurred 98 m from the site on Lowfield Road. Unknown sewage was released into a freshwater stream/river in February 1989.

Four incidents were classed as significant. These occurred between 1989 and 1992, at distances of between 100 and 192 m from the site. One occurred on Lowfield Road and the others occurred on Road Bridge/Bolton Bridge B6098. The pollutants were either of treated or unknown sewage, and were received by a freshwater stream/river. The last incident occurred in 1992, 200 m from the site boundary. This was again at Road Bridge/Bolton Bridge B6098. It was a minor incident and the pollutant type received by a freshwater stream/river is unknown.

3.9 Discharge Consents

The Envirocheck Report indicates the nearest discharge consents to be registered to the sewage works, south west of the site.

3.10 Flooding

Information provided in the Envirocheck Report does not show the site to lie within a flood plain. However, a full flood risk assessment will be required due to the size of the site. Additionally, land adjoining the site to the south and east is shown on historical maps to be at risk from flooding.

4.0 OUTLINE CONCEPTUAL MODEL

The site is being considered for development with housing, with private gardens and areas of associated soft landscaping and hardstanding.

The site has not previously been developed. The topsoil and natural ground may contain naturally elevated heavy metals such as arsenic. Polycyclic aromatic hydrocarbons may also be present. The natural ground may contain sulphates.

The following table details the possible sources and associated contaminants of concern, pathways and receptors, highlighted by the Phase 1 investigation as potentially present.

4.1 Possible Significant Pollutant Linkages

Potential Contaminants	Pathway	Receptor
Heavy metals and PAHs in topsoil or any made ground.	Ingestion, inhalation, direct contact Migration through ground	Site workers, future residents, plants Principal aquifer
Naturally elevated levels of heavy metals in the natural ground	Ingestion, inhalation, direct contact Migration through ground	Site workers, future residents, plants Principal aquifer
Sulphates in natural ground and in any made ground	Direct contact Migration through ground	Below ground concrete
PAH in the natural ground and in any made ground	Direct contact Migration through ground	Water supply pipes

5.0 GROUND INVESTIGATION

5.1 Site Works

We visited site on 08 October 2014 and excavated fifteen trial pits, TP1 to TP15, using a JCB 3CX excavator in order to determine the underlying ground conditions. These reached depths of between 1.35 and 2.35 m below ground level. Four additional pits (referenced SA1 to SA4) were excavated on 09 October 2014 and used for soakaway testing.

Copies of the trial pit logs are presented in Appendix 3, and their positions are plotted on the Exploratory Hole Location Plan, Drawing number 37666/006A in Appendix 1.

5.2 Laboratory Testing

Ten samples of topsoil and three samples of natural ground were dispatched for chemical testing. Soil samples were taken in 500 g plastic tubs and 60 ml Amber jars. All samples were analysed at Chemtech Laboratories, using MCERTs accredited methodologies where available.

Laboratory testing results are presented in Appendix 5 and discussed further in Sections 8.0 to 9.0.

6.0 GROUND CONDITIONS

6.1 Surface Covering

The surface was covered with grass over around 0.3 m of dark brown clayey sandy topsoil.

6.2 Made Ground

No made ground was encountered within the exploratory holes.

6.3 Natural Ground

The natural ground comprises brown and light brown fine to coarse brown gravelly sand, occasionally clayey, to depths of between 0.5 m and 2.2 m bgl, over moderately strong sandstone, which was recovered as gravel and cobbles in a sand matrix.

6.4 Obstructions

No obstructions were encountered during the investigation.

Service records show an underground electric cable and a gas pipe to cross the site from the north west to the south east.

6.5 Groundwater

No groundwater was recorded during the excavations.

6.6 Evidence of Contamination

No visual or olfactory evidence of significant contamination was identified in any of the exploratory holes.

7.0 GEOTECHNICAL APPRAISAL

7.1 General

The ground conditions on site generally comprise around 0.3 m of topsoil over brown fine to coarse, occasionally clayey, gravelly sand, to depths of between 0.5 m and 2.2 m bgl, over sandstone recovered as gravel and cobbles in a sand matrix. No groundwater was encountered.

7.2 Foundations

For the low rise housing scheme proposed, the most suitable foundations are considered to be unreinforced strip or trench fill footings taken through any made or soft ground and founded at a minimum depth of 750 mm below ground level in sand. If competent sandstone is encountered at shallower depths, no further excavations are required.

7.3 Ground Slabs

A ground bearing slab may be considered where there is less than 600 mm of made ground beneath the floor slab, which appears to be the case for this site. If levels are to be raised, a reinforced suspended or precast concrete floor should be used.

7.4 Superstructure Precautions

Superstructure precautions are not considered to be required as a result of the ground conditions encountered within the trial pits.

7.5 Excavation Problems

Excavations may be difficult within the sandstone, which was found at depths as shallow as 0.5 m.

An underground electric cable and a gas pipe are crossing the site, and will need to be diverted.

The sides of trenches and excavations may be slightly unstable within the sand and temporary support may possibly be required in some areas.

Where excavations which workers are required to enter are over 1.2 m deep, or less where there is a risk of harm from collapse of the sides of the excavation, the sides should be supported or battered back to make them safe.

7.6 Roads

The natural ground encountered in the upper 600 mm generally comprised occasionally clayey, gravelly sand. This is likely to have a CBR value of at least 3%. It is recommended that this value is used as a guide only and that full scale CBR tests are undertaken along roadways prior to construction so that accurate values can be obtained to satisfy the Local Authority.

7.7 Surface Water Drainage

Four pits, referenced SA1 to SA4, were excavated for soakaway testing. The infiltration calculations and results are provided in Appendix 4. Eight infiltration tests were carried out across the four pits.

Test	Water Level	BR365 Infiltration Rate (m/sec)	Average Infiltration Rate (m/sec)
SA1 (1)	440 mm in 96 minutes	35×10^{-06}	N/A
SA1 (2)	400 mm in 172 minutes	20×10^{-06}	N/A
SA1 (3)	180 mm in 60 minutes	N/A	19×10^{-06}
SA2 (1)	400 mm in 194 minutes	20×10^{-06}	N/A
SA2 (2)	260 mm in 141 minutes	N/A	14×10^{-06}
SA3	390 mm in 290 minutes	10×10^{-06}	N/A
SA4 (1)	420 mm in 94 minutes	57×10^{-06}	N/A
SA4 (2)	230 mm in 110 minutes	N/A	13×10^{-06}

Generally, moderate to poor infiltration rates were recorded. Soakaways are therefore not considered to be a viable method of surface water drainage for the proposed development.

8.0 REFINEMENT OF OUTLINE CONCEPTUAL MODEL

8.1 Source Characterisation

An outline conceptual model, detailing the possible sources and associated contaminants of concern, potential pathways and receptors identified in the Phase 1 report, is set out in Section 4.0 above.

This section of the report documents the works undertaken to obtain information to test and refine this model enabling a risk assessment to be produced and, where significant risks are expected, remediation recommendations.

8.2 Gas Precautions

The site is in an area where no radon protections are required for new dwellings.

The Envirocheck Report indicates that the site is not within 500 m of a current or historic landfill. Made ground has not been encountered on site. Ground gas precautions are not considered to be necessary.

8.3 Unexpected Contamination

No visual or olfactory evidence of significant contamination was identified during the site investigation.

8.4 Chemical Testing

Ten samples of topsoil and three samples of natural ground were dispatched for chemical testing. Each of the samples was analysed for the suite of contaminants listed in the table below:

Contaminant Type	Actual Contaminants
Metals/Metalloids	Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Copper and Zinc
pH	pH
PAHs	Speciated PAH
Sulphates*	Water soluble sulphate, acid soluble sulphate and sulphur

*Natural ground only

8.5 Assessment Criteria

The proposed development of the site is for residential properties with private gardens. Therefore the assessment criteria relating to a residential end use have been used. Tables detailing the relevant assessment concentrations used are included in Appendix 5.

8.6 Chemical Test Results

8.6.1 Topsoil

None of the tested determinands exceeded their respective assessment values.

8.6.2 Natural Ground

None of the tested determinands exceeded their respective assessment values.

8.6.3 Sulphates

The site has been taken as a greenfield location in relation to the Aggressive Chemical Environment for Concrete calculations.

Tests for total sulphur indicate that the total potential sulphates for the natural ground are less than 0.03%, compared with upper class limit of 0.24% for class DS-1.

The concentrations of water soluble sulphate in the natural ground are below 10 mg/l, compared with the upper limit of Design Sulphate Class 1 of 500 mg/l.

pH levels for the natural ground samples varies between 6.9 and 7.4.

9.0 RISK ASSESSMENT

9.1 Human Health: Future Residents and Visitors

The results of the chemical testing undertaken indicate that the topsoil and natural ground on the site are not considered to pose a significant risk to the health of future residents, visitors or other site users.

The topsoil can be considered to be suitable for re-use in the proposed development.

9.2 Human Health: Construction Workers

Significant contamination was generally not encountered. Normal precautions, such as washing hands before eating, should be sufficient to mitigate any risk posed to construction workers. Any unusual, brightly coloured or odorous material encountered during construction should be brought to the attention of the site staff and investigated.

9.3 Plants

Significantly elevated concentrations of phytotoxic elements were recorded. Therefore, no significant risk to plants is anticipated from the soils on site.

9.4 Concrete

The chemical test results indicate DS-1 AC-1 sulphate precautions are appropriate for underground concrete.

9.5 Controlled Waters

No significant risks are expected to be posed to controlled waters.

9.6 Disposal of Material

If material needs to be removed, it should to be taken to a suitably licensed landfill or waste treatment facility. The costs of disposal and landfill tax can be substantial. The disposal of material should therefore be seen as a last resort with options such as treatment and reuse either on-site or off-site considered where possible.

The category of landfill which can accept the waste (inert, non-hazardous or hazardous) would need to be determined and will also have a significant effect on the costs. Additional testing may be required by the landfill operator and the acceptance of material is generally at their discretion.

10.0 CONTAMINATION - RECOMMENDATIONS AND APPROVALS

1. Significant contamination was not encountered in the materials tested. Remedial measures are not considered necessary. The topsoil can be considered suitable for re-use.

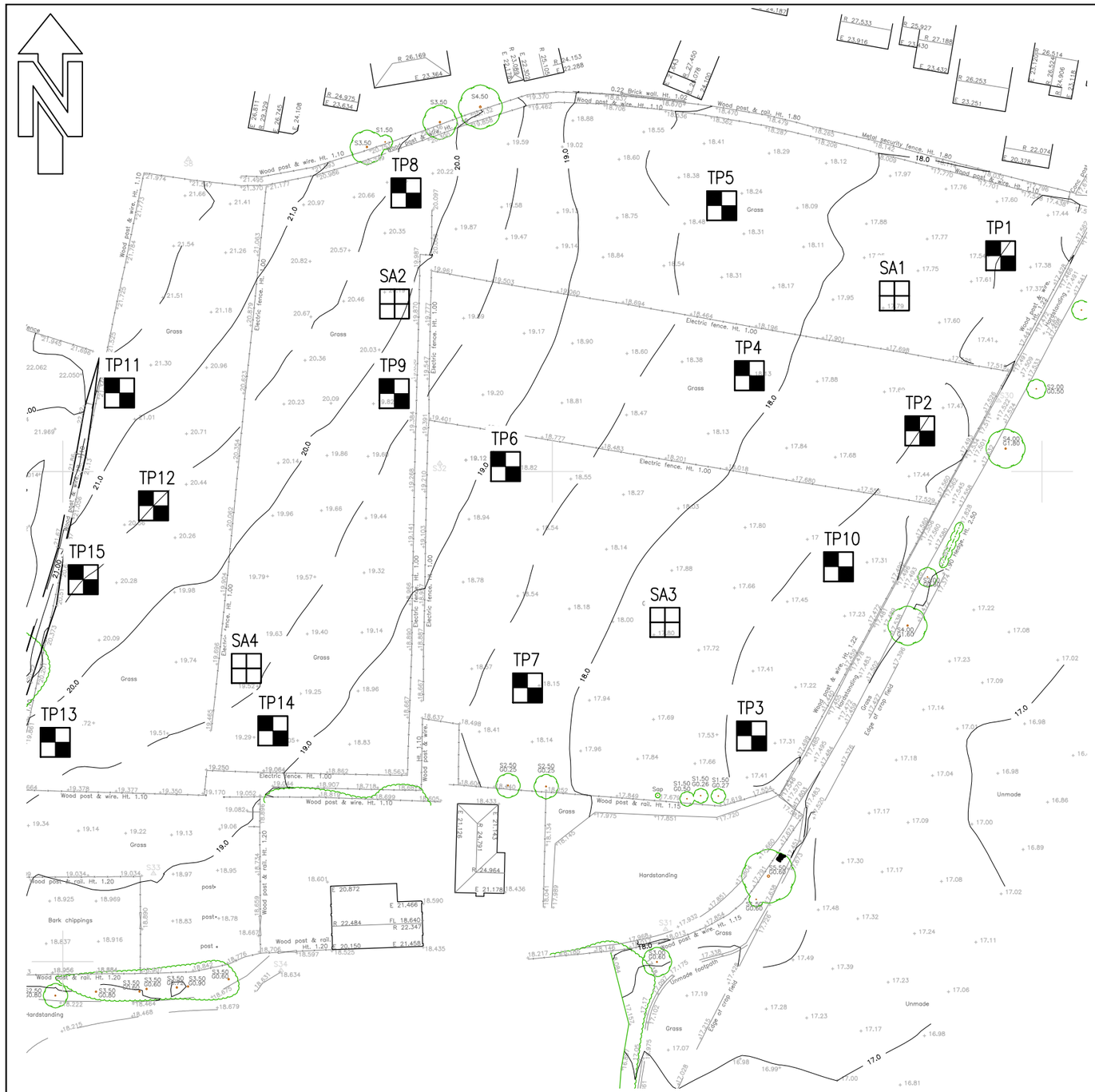
2. DS-1 AC-1 sulphate precautions are appropriate for the below ground concrete on the site.

3. The conclusions made in this report in relation to contamination are subject to agreement by the approving bodies such as the Local Authority and your warranty provider.

Appendix 1

'Exploratory Hole Location Plan', Drawing Number 37666/006A

Information within this drawing is not necessarily produced to scale.
Always use figured dimensions and co-ordinates – if in doubt, ask.



Approximate location of trial pits excavated by Eastwood & Partners on 08/10/14.

Approximate location of soakaway tests undertaken by Eastwood & Partners on 09/10/14.

For Western part of the site, please refer to 37666/007.

Eastwood & Partners
CONSULTING ENGINEERS
St. Andrew's House
23 Kingfield Road
Sheffield
S11 9AS
Tel 0114 255 4554
Fax 0114 255 4330
mail@eastwoodandpartners.com
www.eastwoodandpartners.com

GLEESON DEVELOPMENTS LTD

LOWFIELD ROAD PHASE 3, BOLTON ON DEARNE

EXPLORATORY HOLE LOCATION PLAN

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

SCALE WHEN PLOTTED AT A3	DRAWING STATUS
1:1000	PRELIMINARY

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
RH	MM	10.10.14	37666/006	A

Appendix 2

Envirocheck Report

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
Pylon
Electricity Transmission Line
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

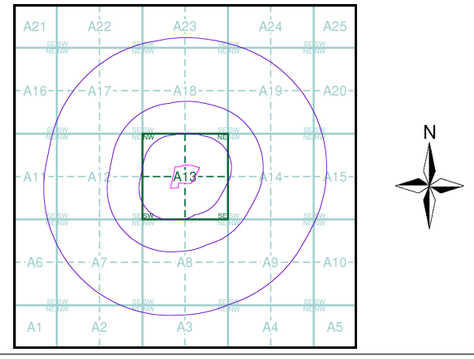
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Mud
Sand
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or 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

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:10,560	1851 - 1855	2
Yorkshire	1:10,560	1893	3
Yorkshire	1:10,560	1894	4
Yorkshire	1:10,560	1903 - 1907	5
Yorkshire	1:10,560	1931 - 1932	6
Yorkshire	1:10,560	1938 - 1948	7
Yorkshire	1:10,560	1948 - 1950	8
Ordnance Survey Plan	1:10,000	1956	9
Ordnance Survey Plan	1:10,000	1966 - 1967	10
Ordnance Survey Plan	1:10,000	1976	11
Ordnance Survey Plan	1:10,000	1980 - 1988	12
Ordnance Survey Plan	1:10,000	1989	13
10K Raster Mapping	1:10,000	2006	14
VectorMap Local	1:10,000	2014	15

Historical Map - Slice A



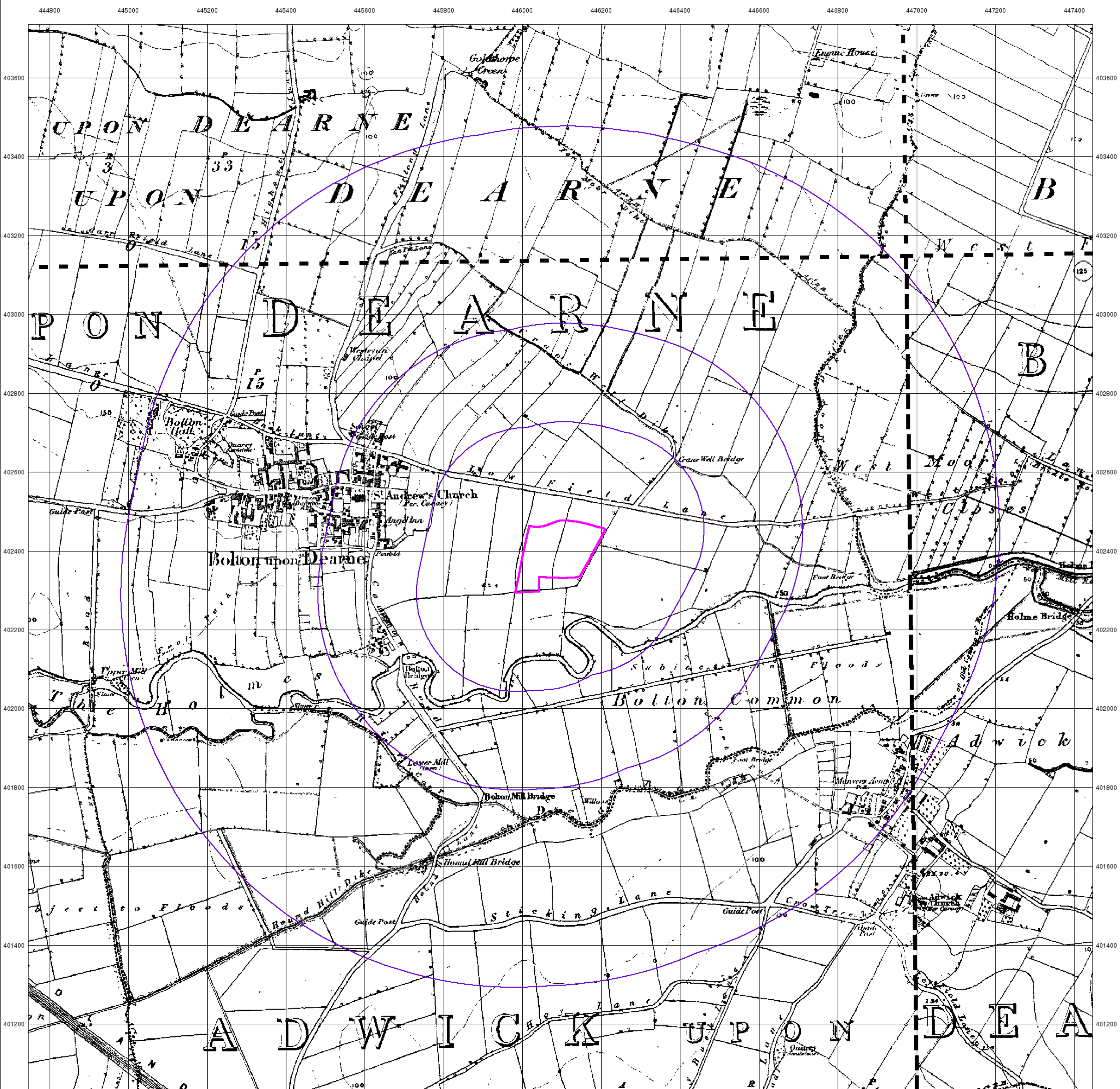
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Slice: A
Site Area (Ha): 2.62
Search Buffer (m): 1000

Site Details

Bolton-upon-Dearne, ROTHERHAM, South Yorkshire, S63 8JQ

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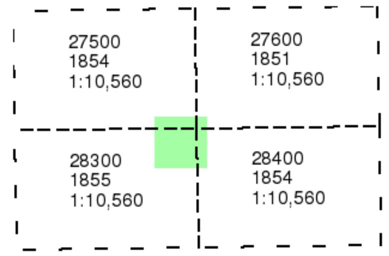
Yorkshire

Published 1851 - 1855

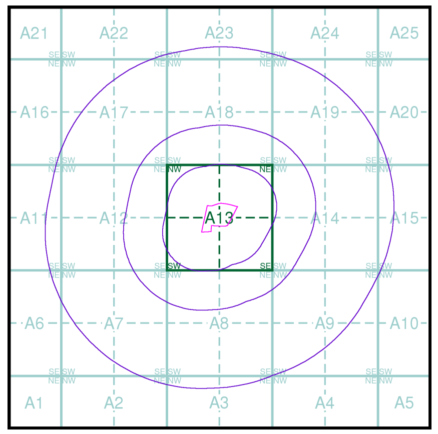
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Map Name(s) and Date(s)



Historical Map - Slice A



N

Order Details

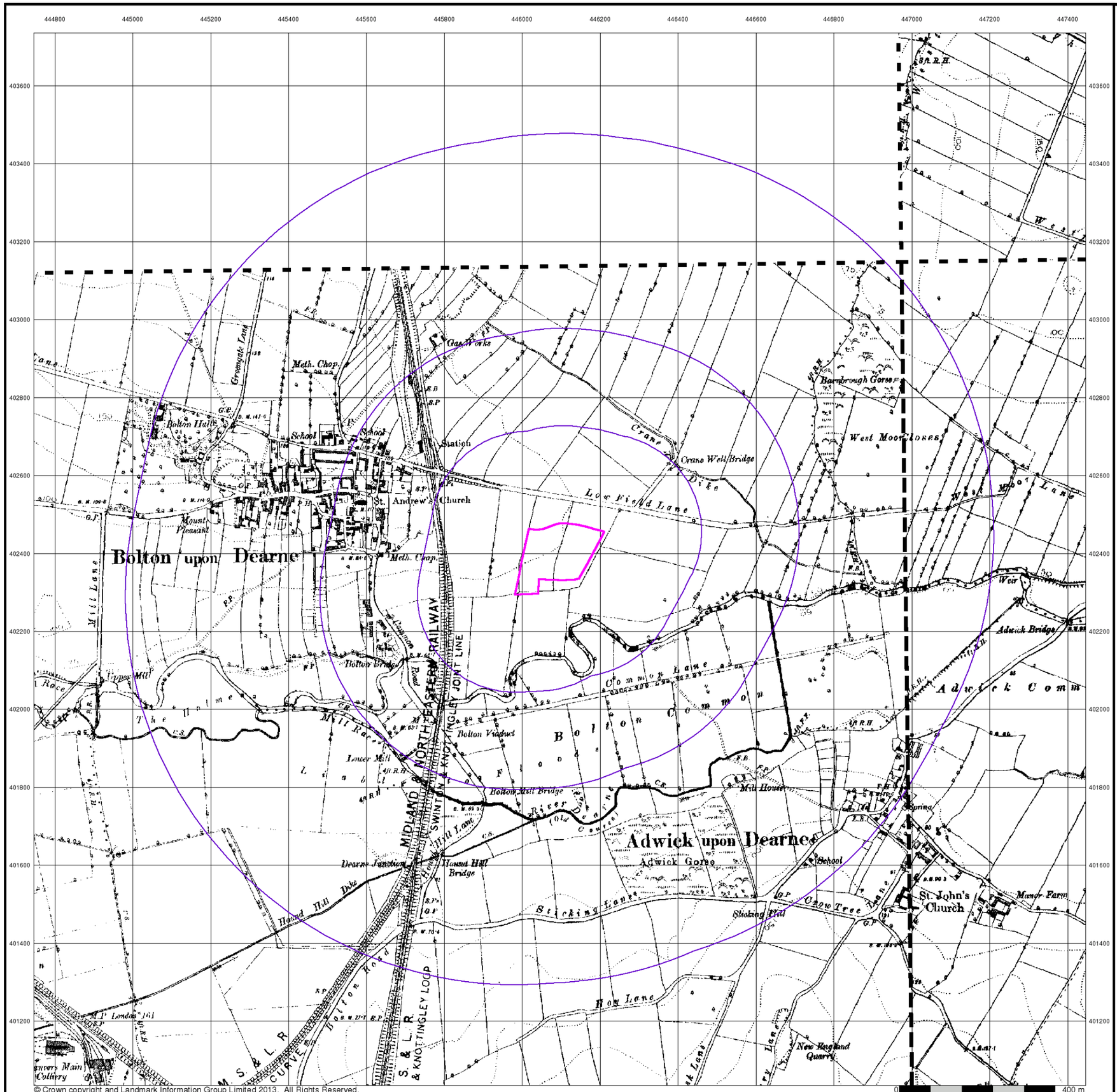
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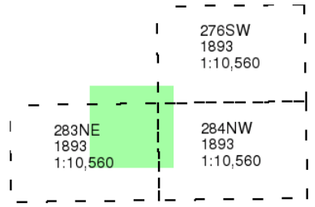
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Published 1893

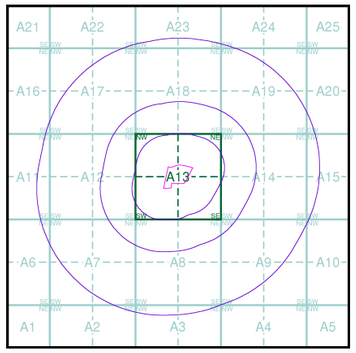
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



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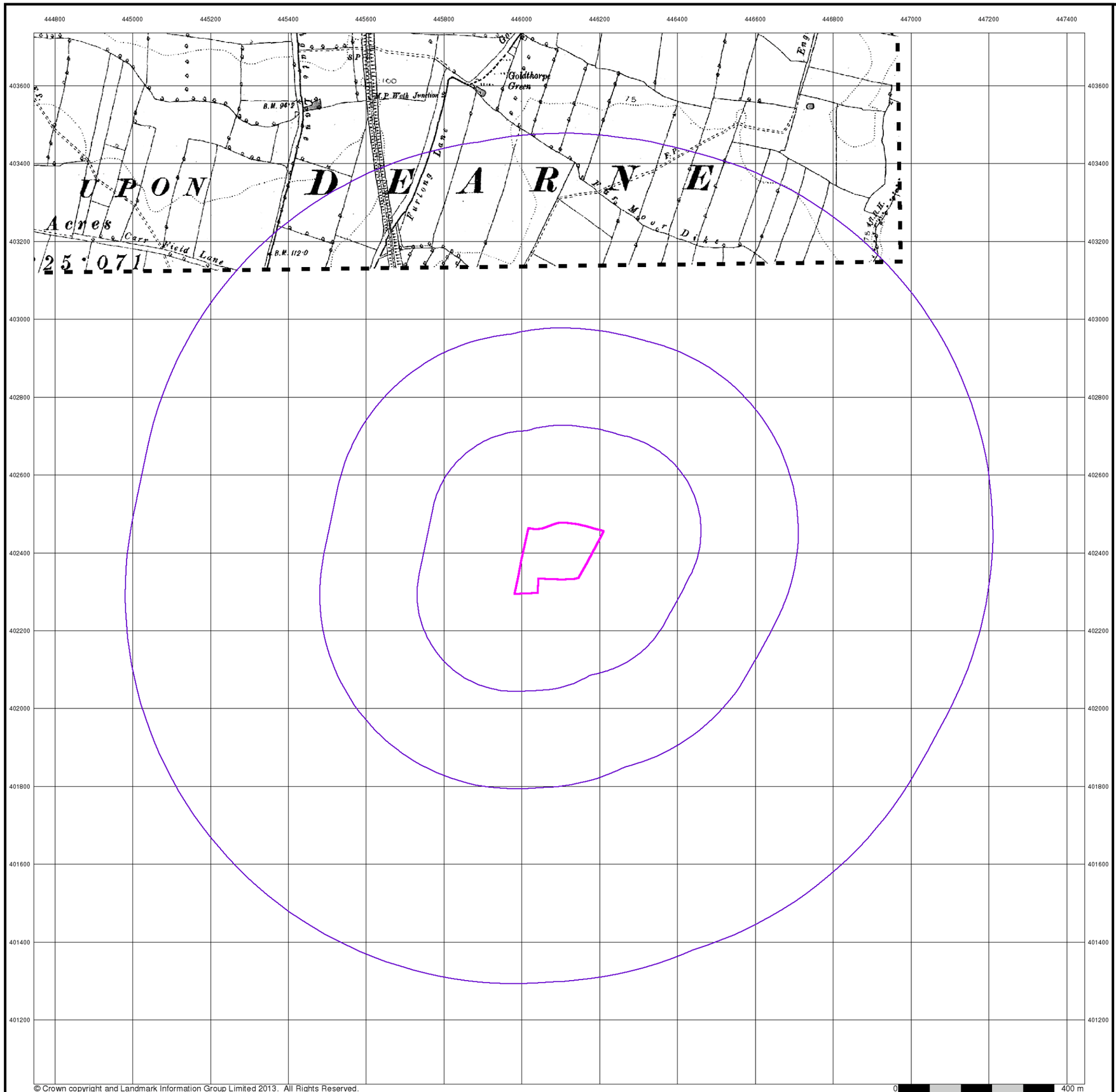
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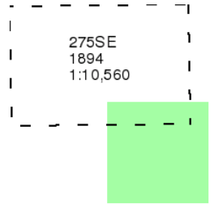
Yorkshire

Published 1894

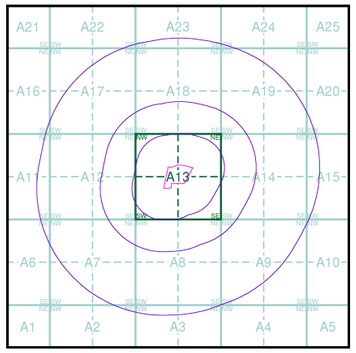
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

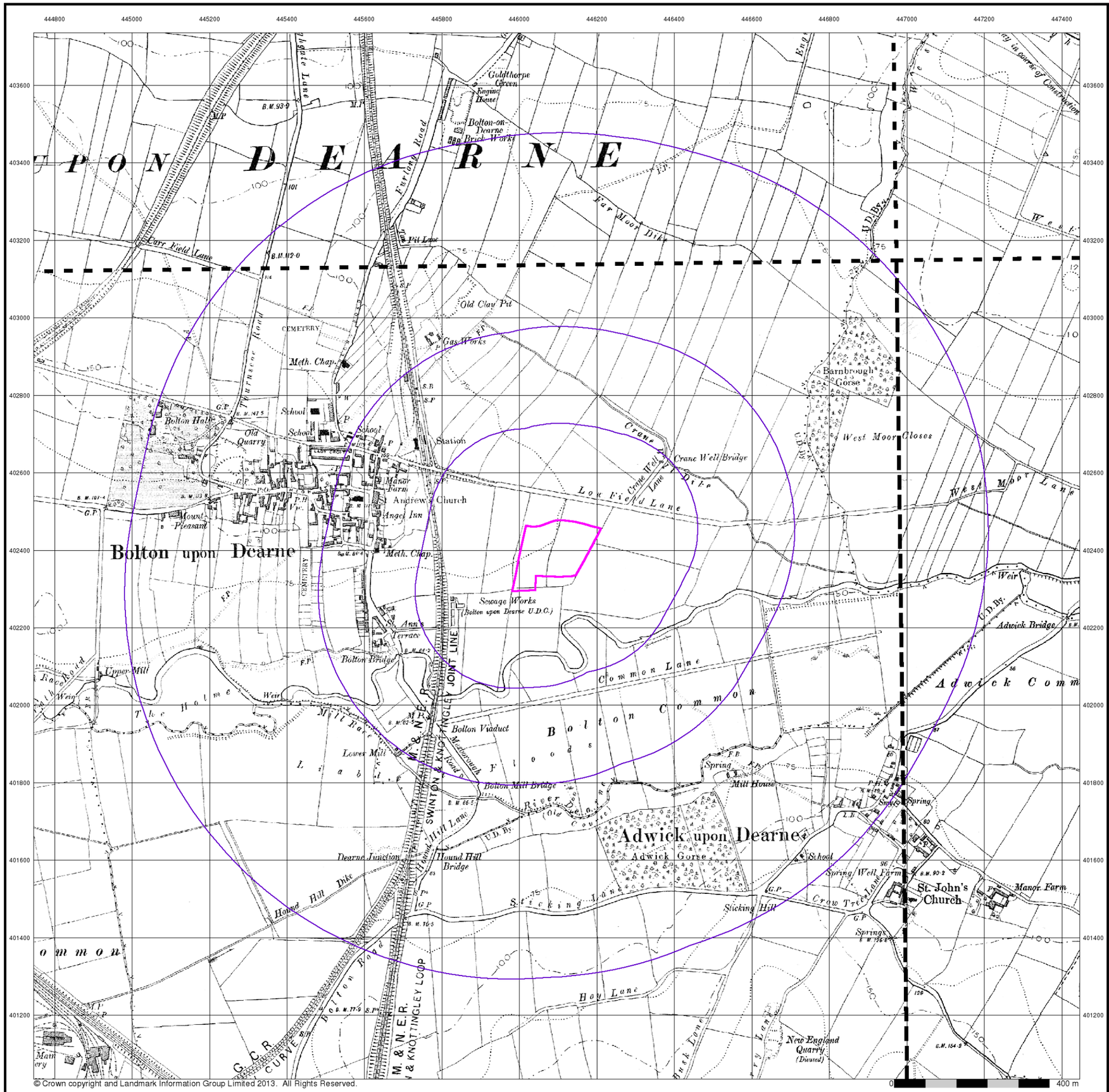
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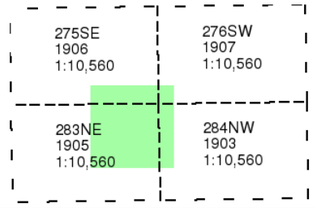
Yorkshire

Published 1903 - 1907

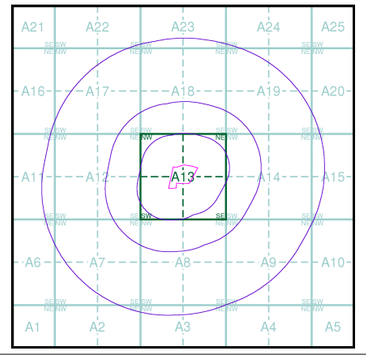
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



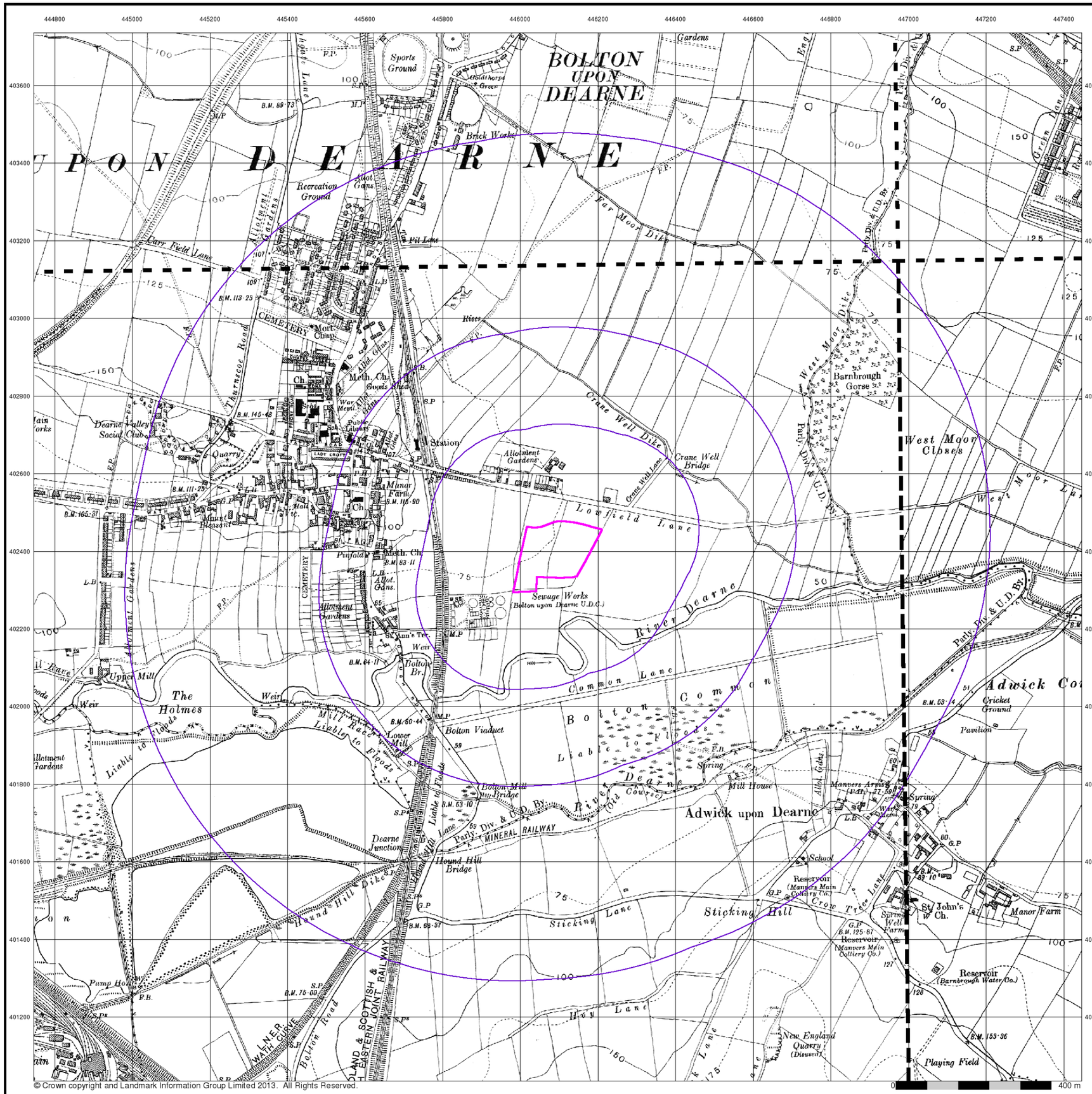
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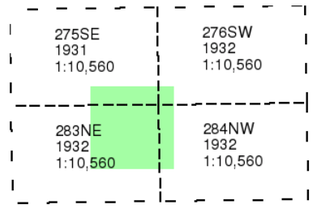
Yorkshire

Published 1931 - 1932

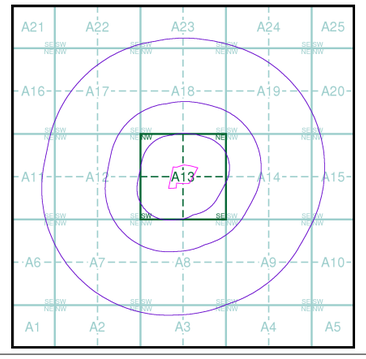
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



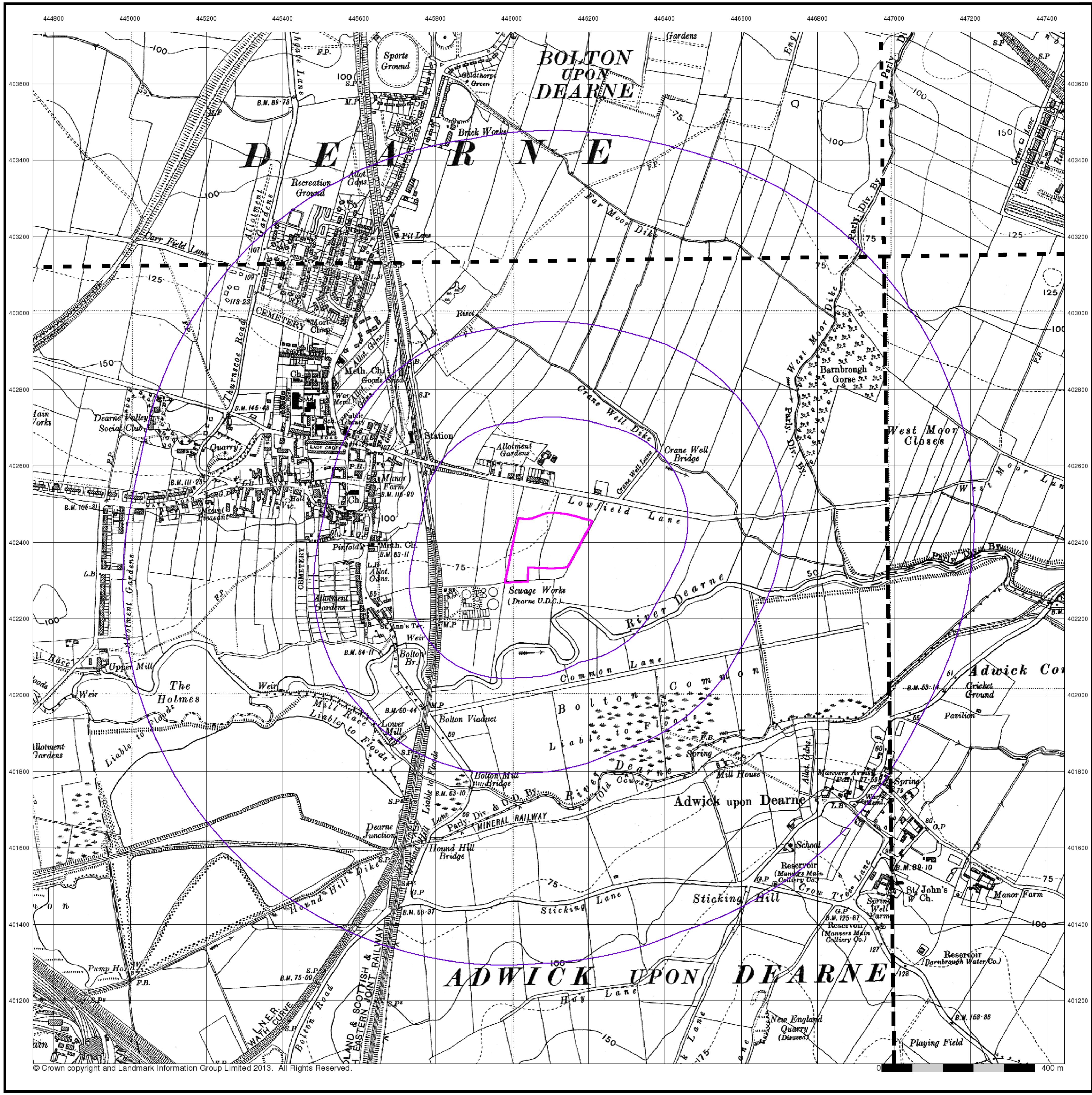
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Yorkshire

Published 1938 - 1948

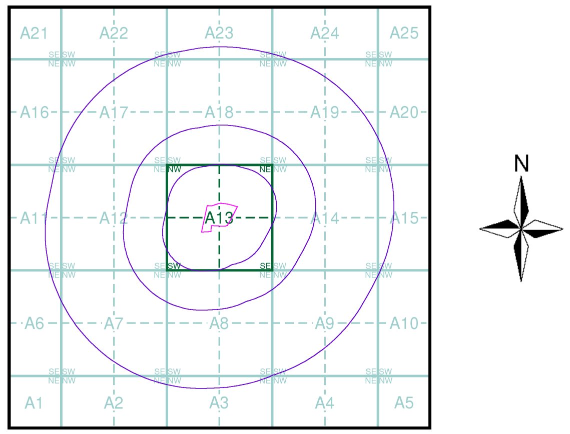
Source map scale - 1:10,560

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Map Name(s) and Date(s)

275SE 1938 1:10,560	276SW 1948 1:10,560
283NE 1938 1:10,560	284NW 1948 1:10,560

Historical Map - Slice A



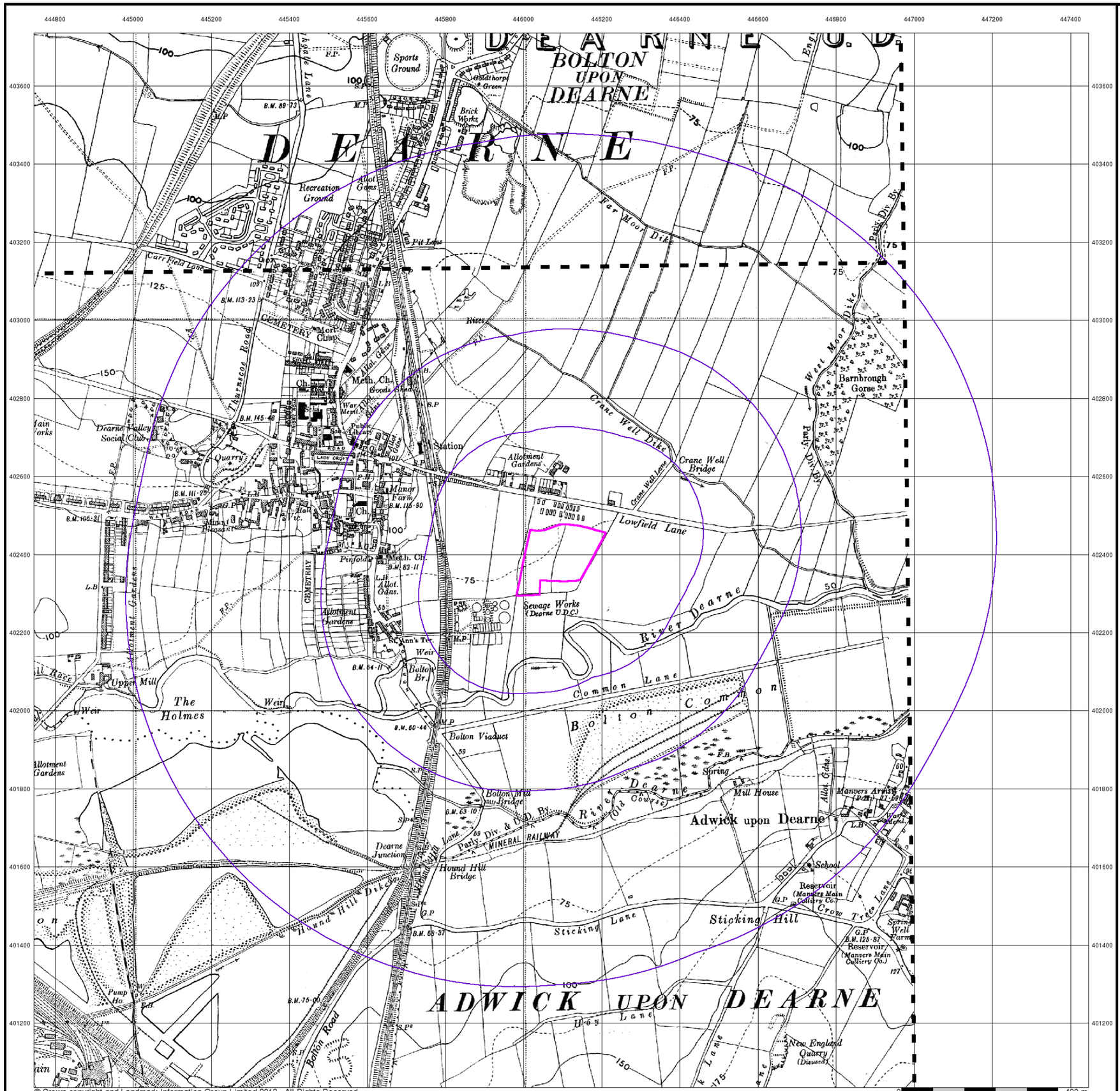
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Yorkshire

Published 1948 - 1950

Source map scale - 1:10,560

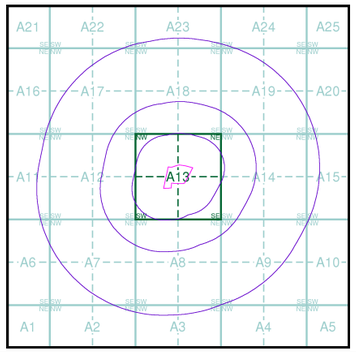
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Map Name(s) and Date(s)

275SE
1948
1:10,560

283NE
1950
1:10,560

Historical Map - Slice A



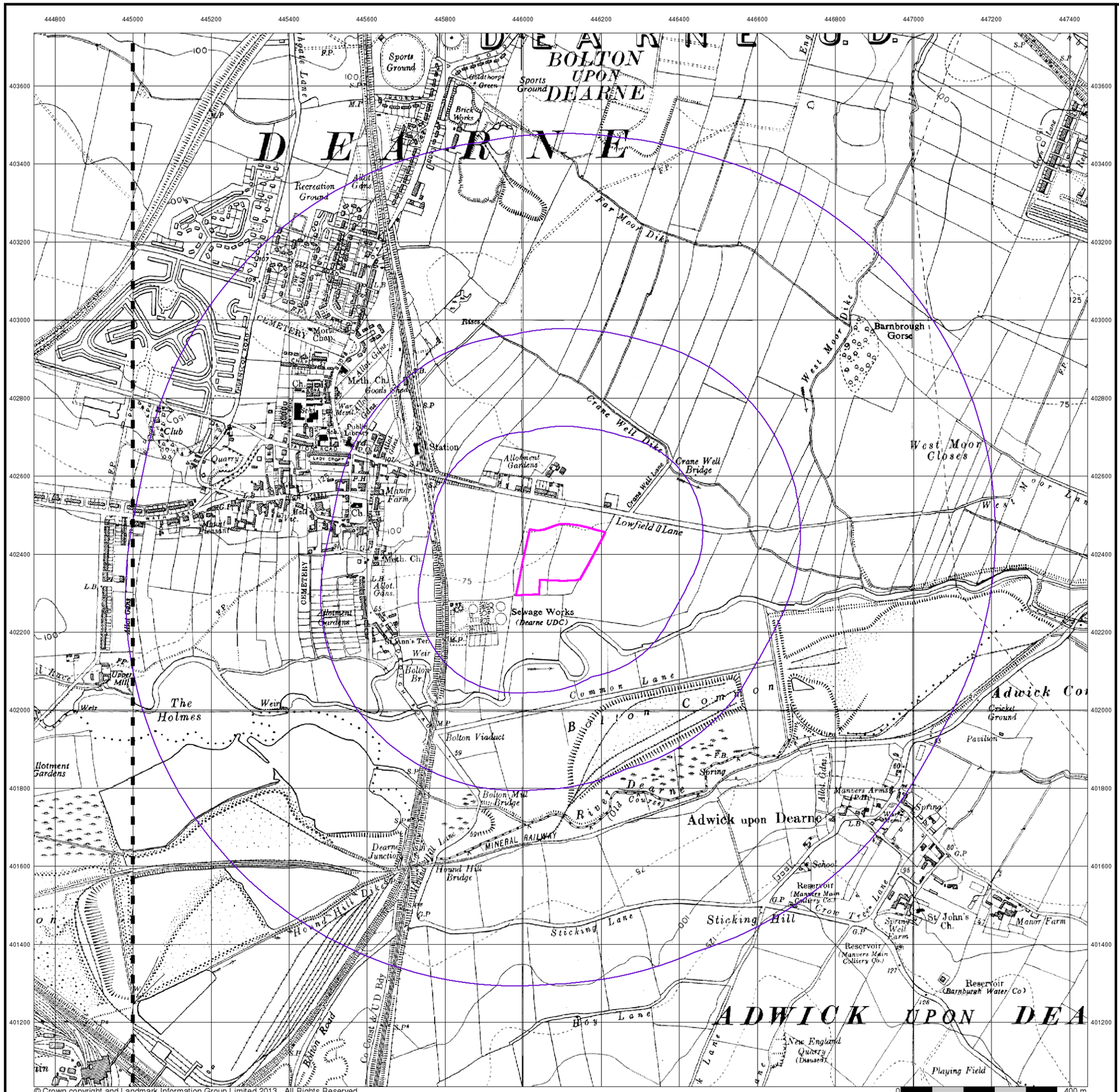
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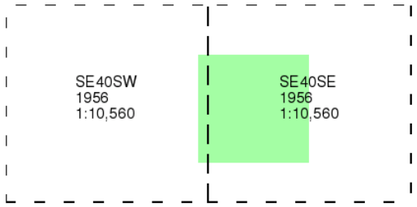
Ordnance Survey Plan

Published 1956

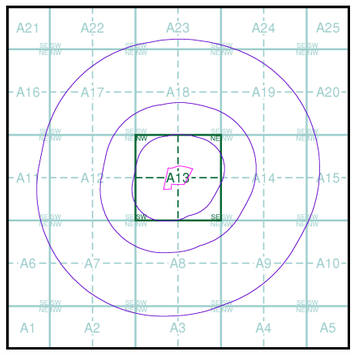
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Map Name(s) and Date(s)



Historical Map - Slice A



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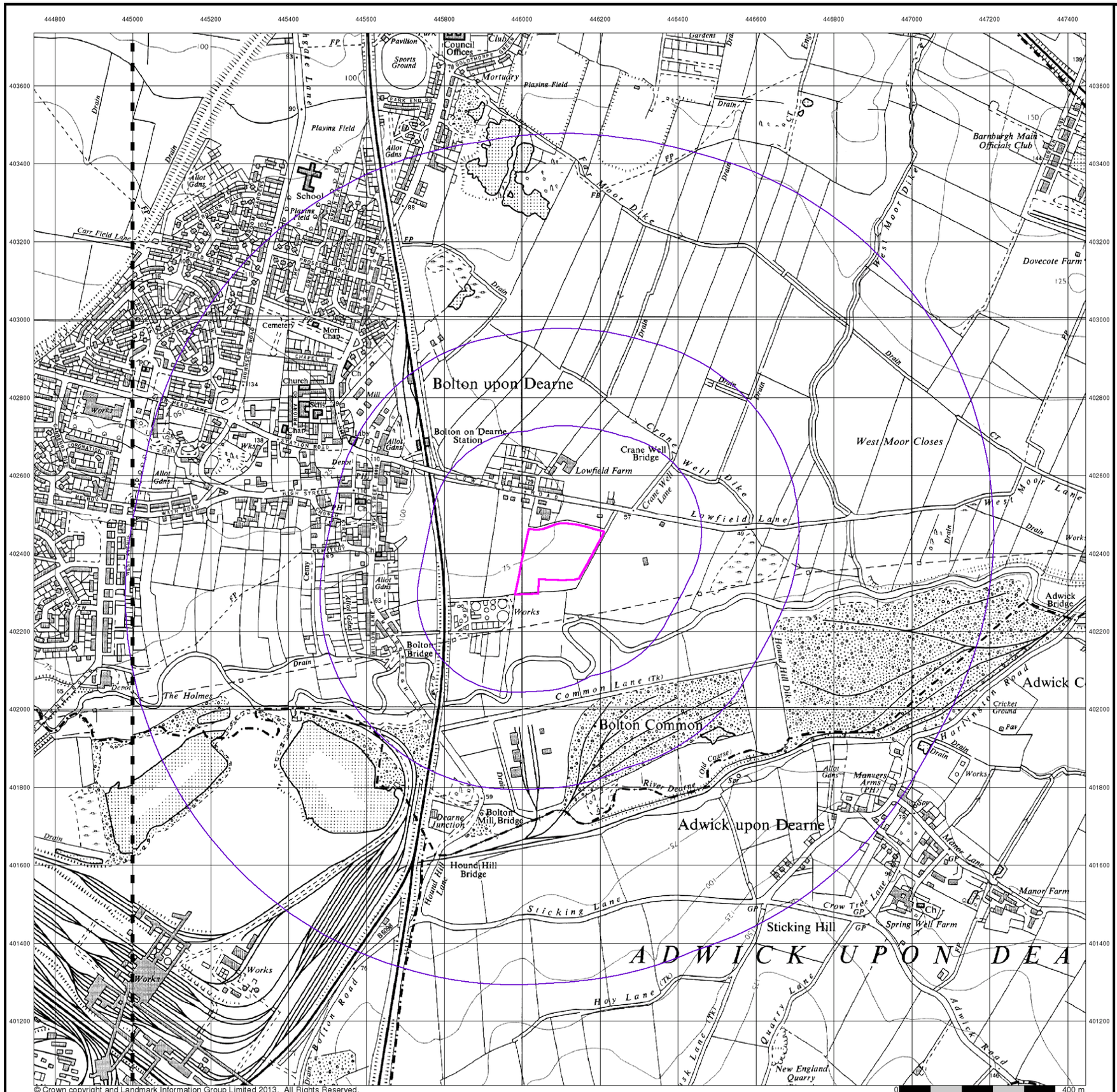
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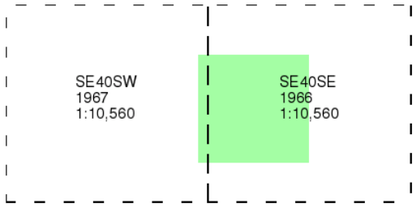
Ordnance Survey Plan

Published 1966 - 1967

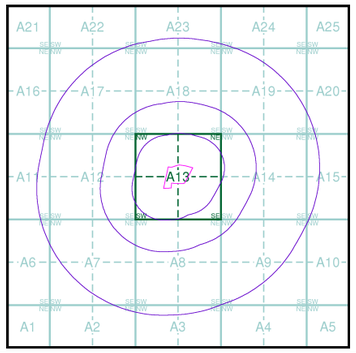
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Map Name(s) and Date(s)



Historical Map - Slice A



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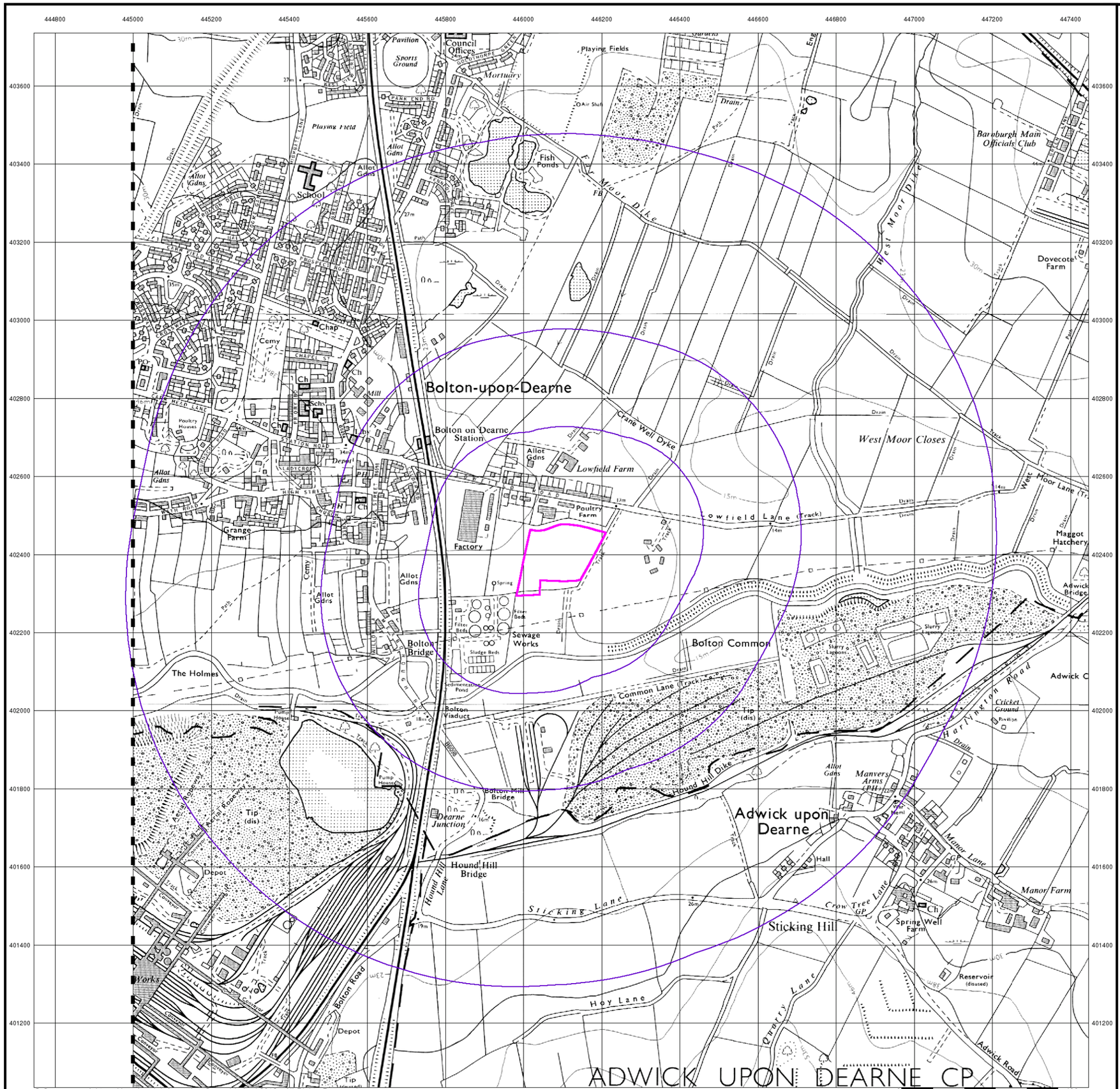
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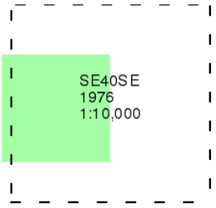
Ordnance Survey Plan

Published 1976

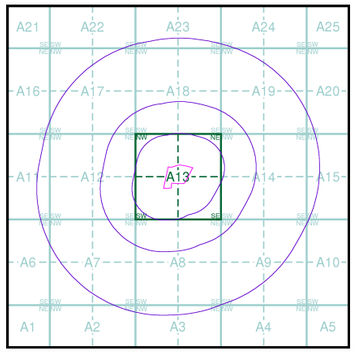
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Historical Map - Slice A



Order Details

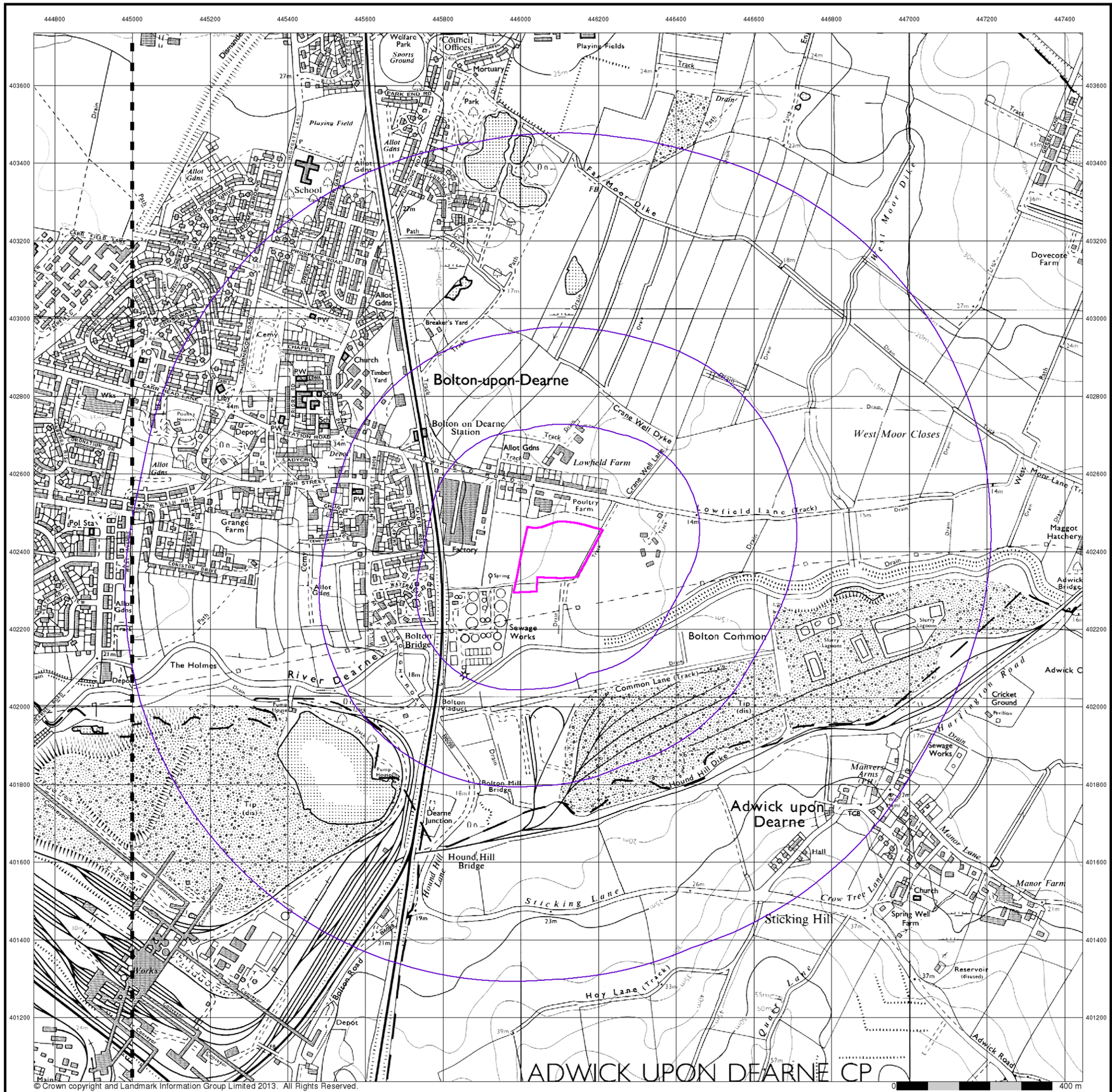
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Slice:	A
Site Area (Ha):	2.62
Search Buffer (m):	1000

Site Details

Bolton-upon-Dearne, ROTHERHAM, South Yorkshire, S63 8JQ

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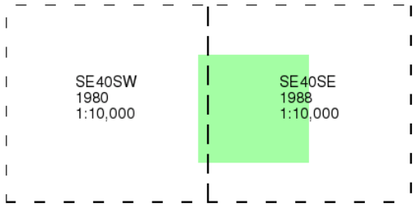
Ordnance Survey Plan

Published 1980 - 1988

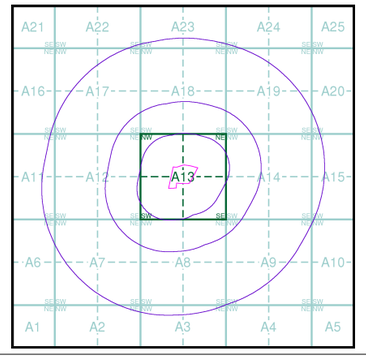
Source map scale - 1:10,000

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

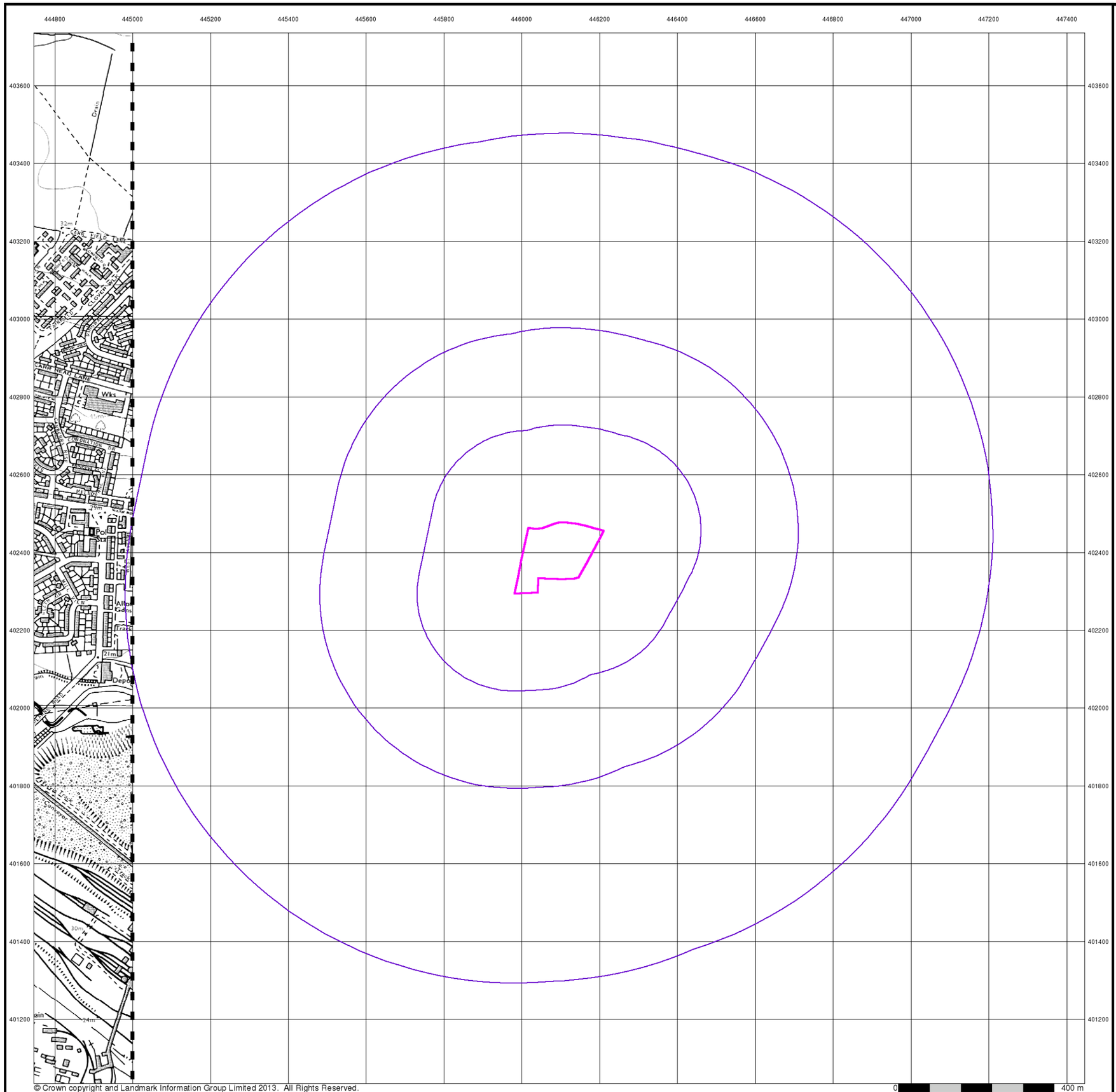
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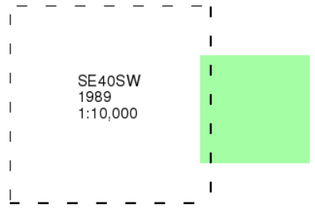
Ordnance Survey Plan

Published 1989

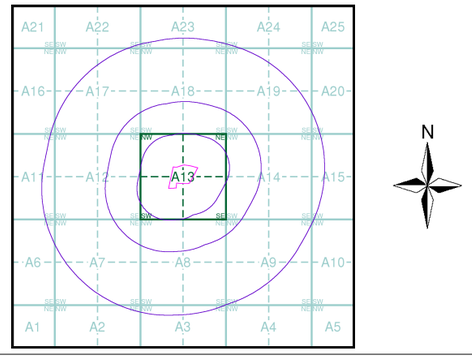
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

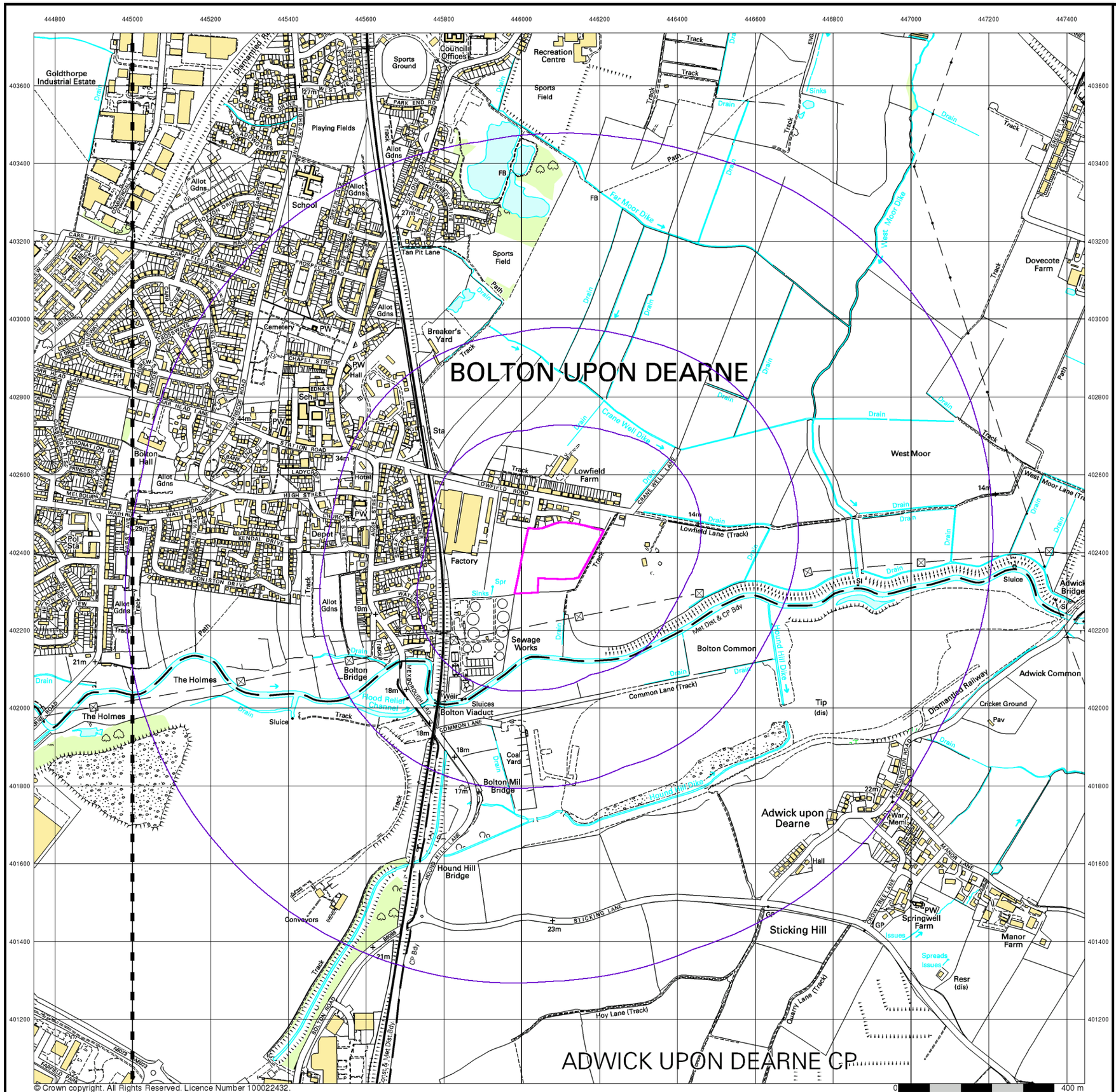
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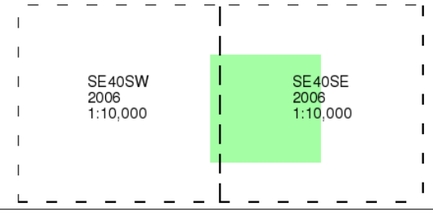
10k Raster Mapping

Published 2006

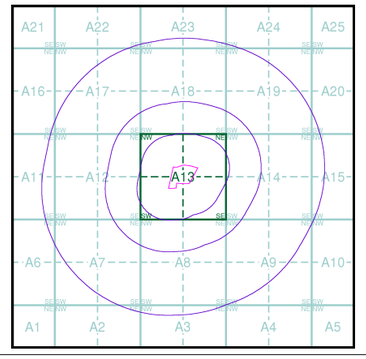
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



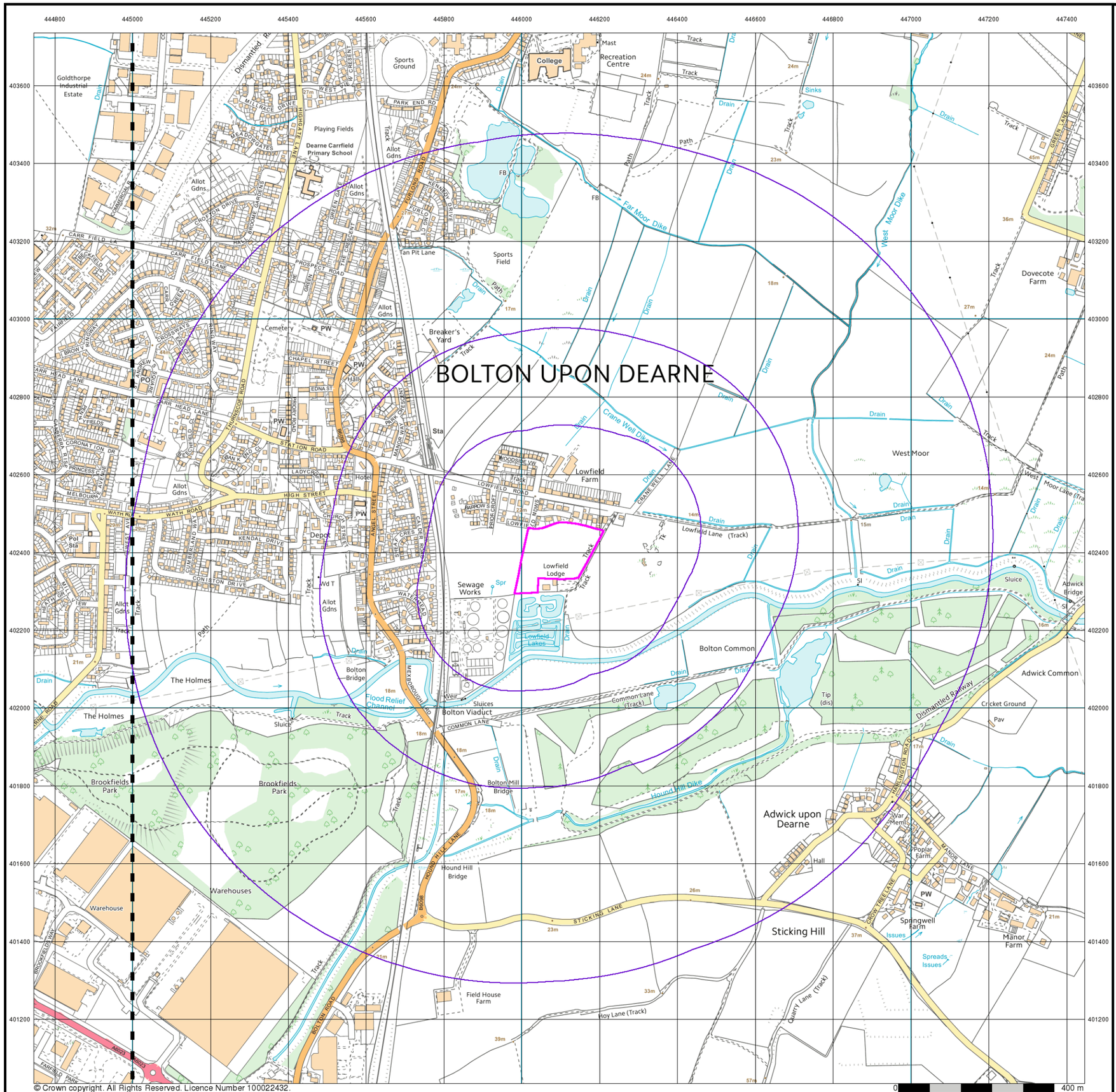
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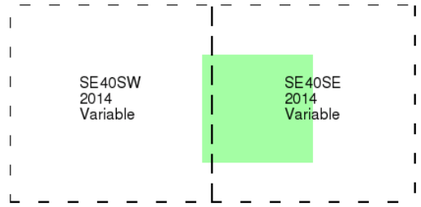
VectorMap Local

Published 2014

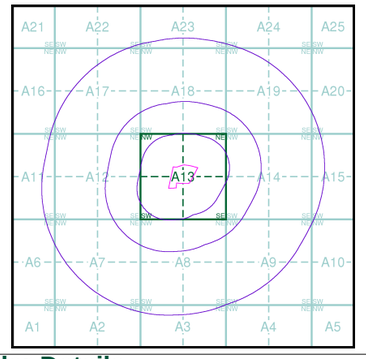
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



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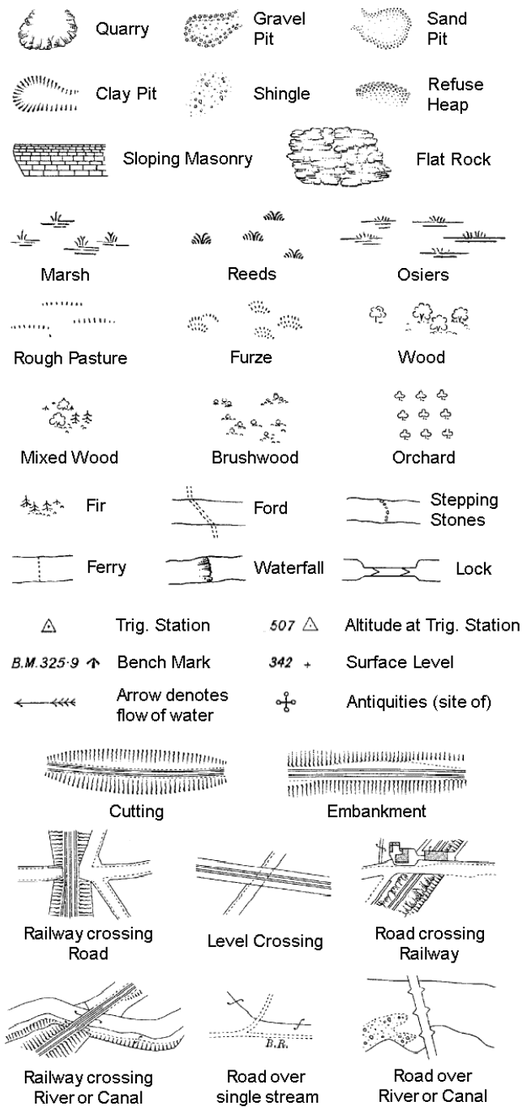
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Historical Mapping Legends

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



County Boundary (Geographical)

County & Civil Parish Boundary

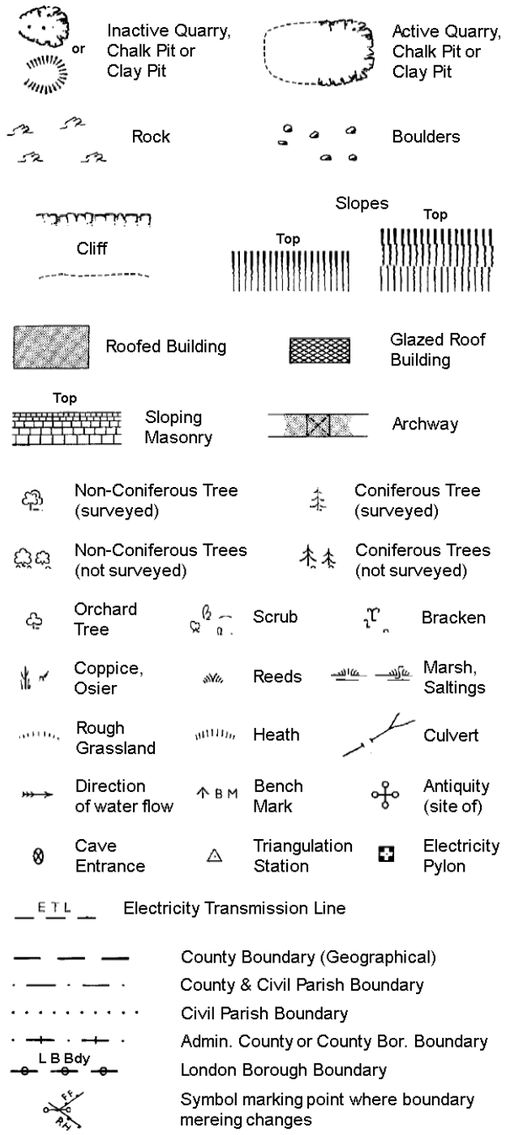
Administrative County & Civil Parish Boundary

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

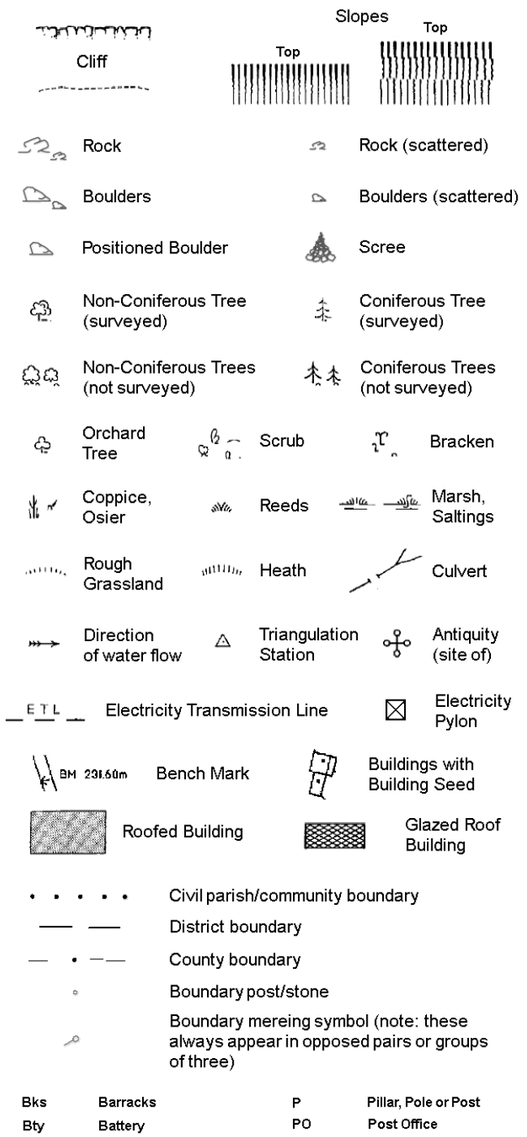
Admin. County or County Bor. Boundary

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)

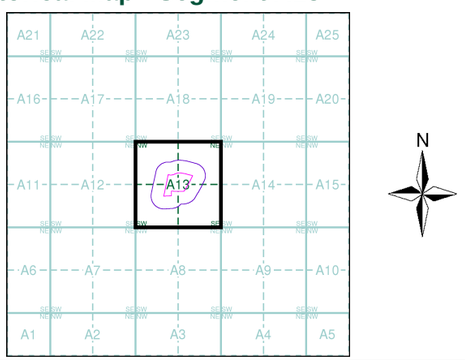
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity 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

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:2,500	1892	2
Yorkshire	1:2,500	1903	3
Yorkshire	1:2,500	1930	4
Ordnance Survey Plan	1:1,250	1961	5
Ordnance Survey Plan	1:2,500	1962	6
Ordnance Survey Plan	1:1,250	1971 - 1975	7
Ordnance Survey Plan	1:2,500	1972	8
Additional SIMs	1:1,250	1979	9
Additional SIMs	1:1,250	1982	10
Large-Scale National Grid Data	1:1,250	1993	11
Large-Scale National Grid Data	1:2,500	1993	12
Large-Scale National Grid Data	1:1,250	1994 - 1995	13

Historical Map - Segment A13



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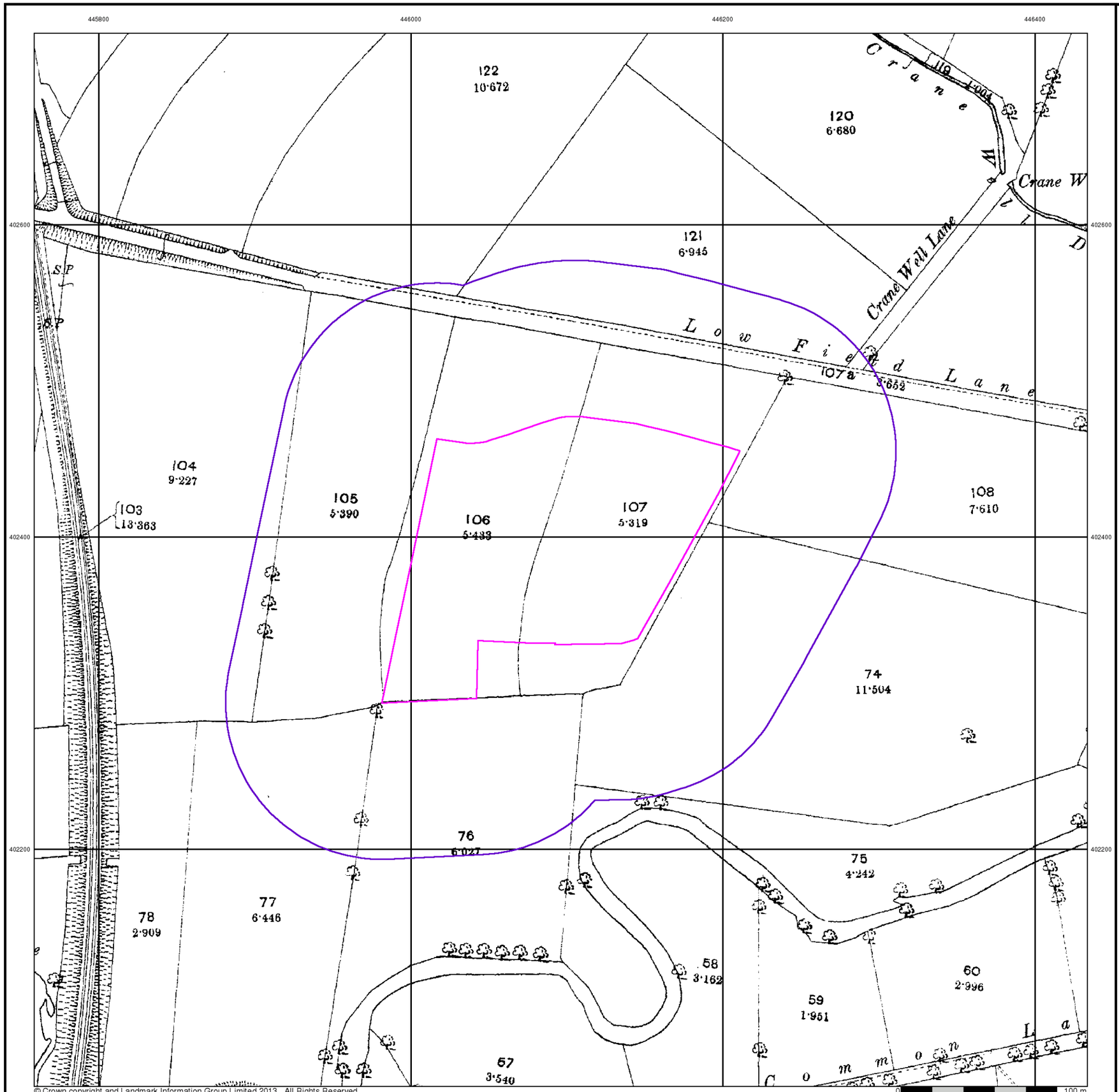
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Customer Ref:	37666/PR
National Grid Reference:	446090, 402390
Slice:	A
Site Area (Ha):	2.62
Search Buffer (m):	100

Site Details

Bolton-upon-Dearne, ROTHERHAM, South Yorkshire, S63 8JQ

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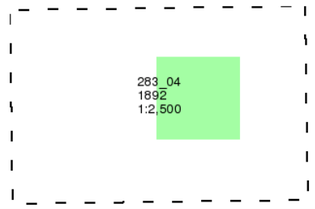
Yorkshire

Published 1892

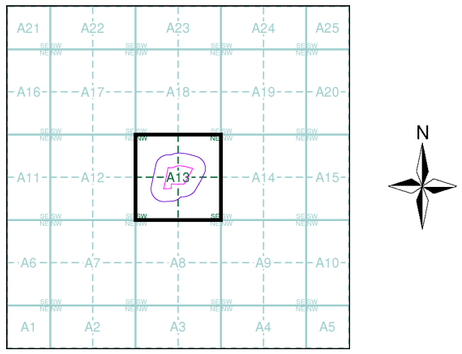
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered 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

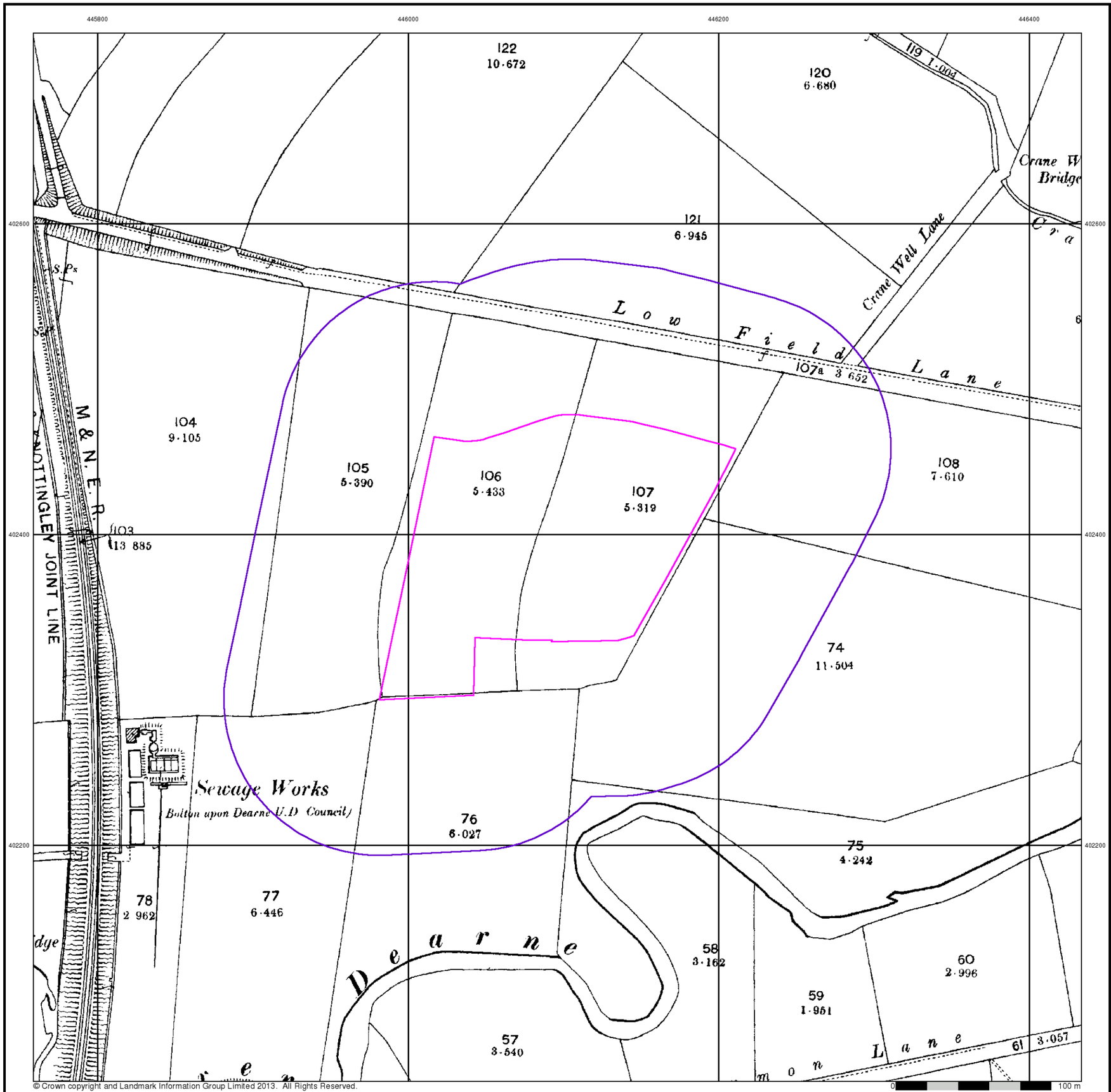
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Yorkshire

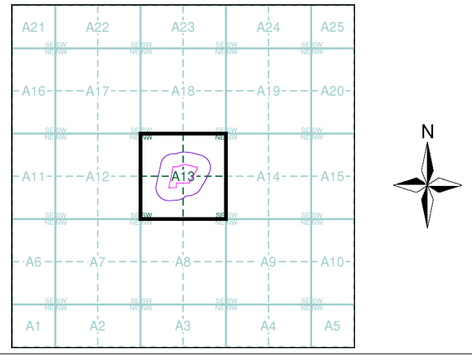
Published 1903

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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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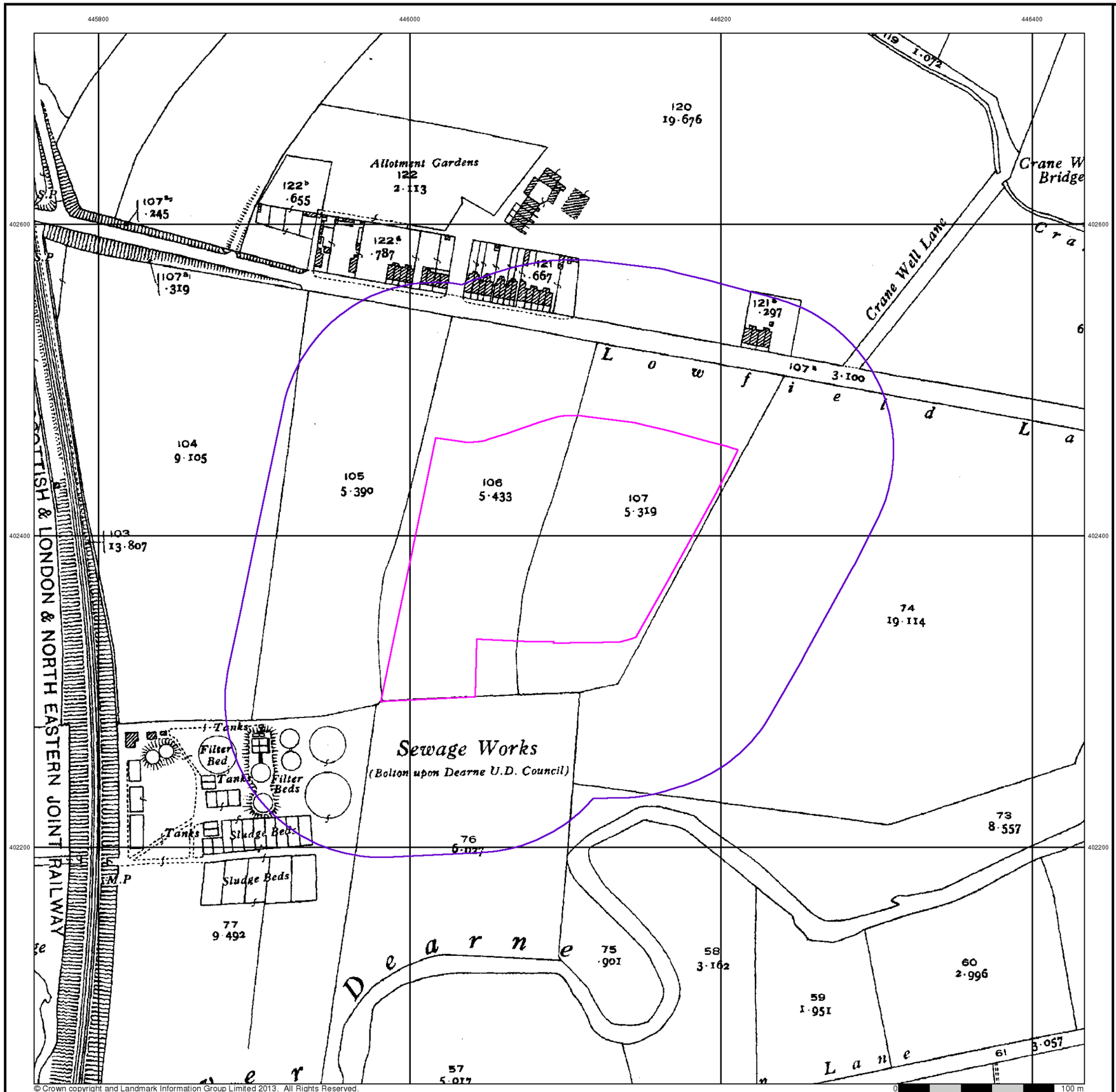
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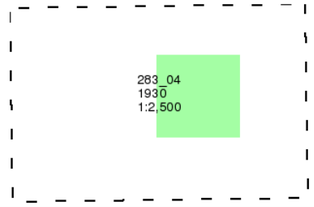
Yorkshire

Published 1930

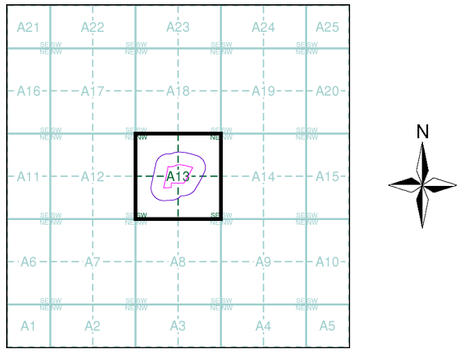
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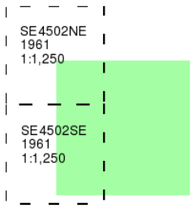
Ordnance Survey Plan

Published 1961

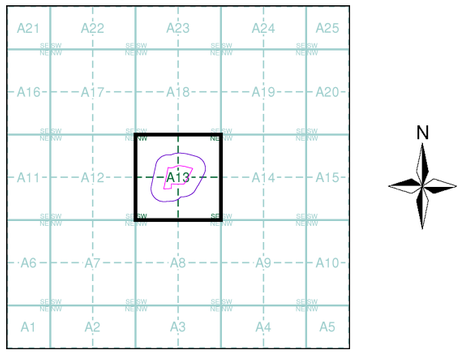
Source map scale - 1:1,250

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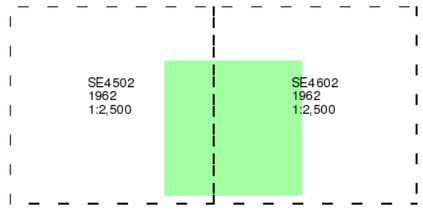
Ordnance Survey Plan

Published 1962

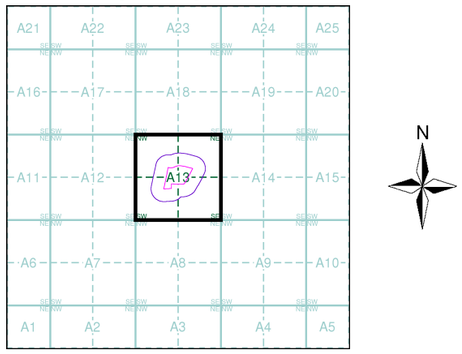
Source map scale - 1:2,500

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