

Old Moor

2018s1534

Geotechnical and Geoenvironmental Desktop Assessment

Draft Report

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Contract

This report describes work commissioned by Jayne Wood, on behalf of RSPB, by an email dated 02/08/2018. Stephen Dixon of JBA Consulting carried out this work.

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Purpose

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1 Introduction

1.1 Brief

RSPB are proposing to undertake habitat improvement works of the RSPB Dearne Valley Old Moor site, located 8.5km south-east of Barnsley train station, Yorkshire at National Grid Reference E442616, N402496.

The site plan is shown in Figure 1-1, and the site location is shown in Figure 2-1.

The scheme involves the following elements (drawing reference 2018s0929-101 dated 31 October 2018):

1. Re-profile some of the banks on the mere creating a gentler slope into the water.
2. Re-use of the offsite spoil from Wombwell Ings and the onsite spoil from re-profiling to create islands in some of the areas of the reserve.
3. Build a walkway with viewing points as part of Green Lane Circular Walk.
4. The water levels will be lowered to make the work accessible and to ensure a safe working environment.

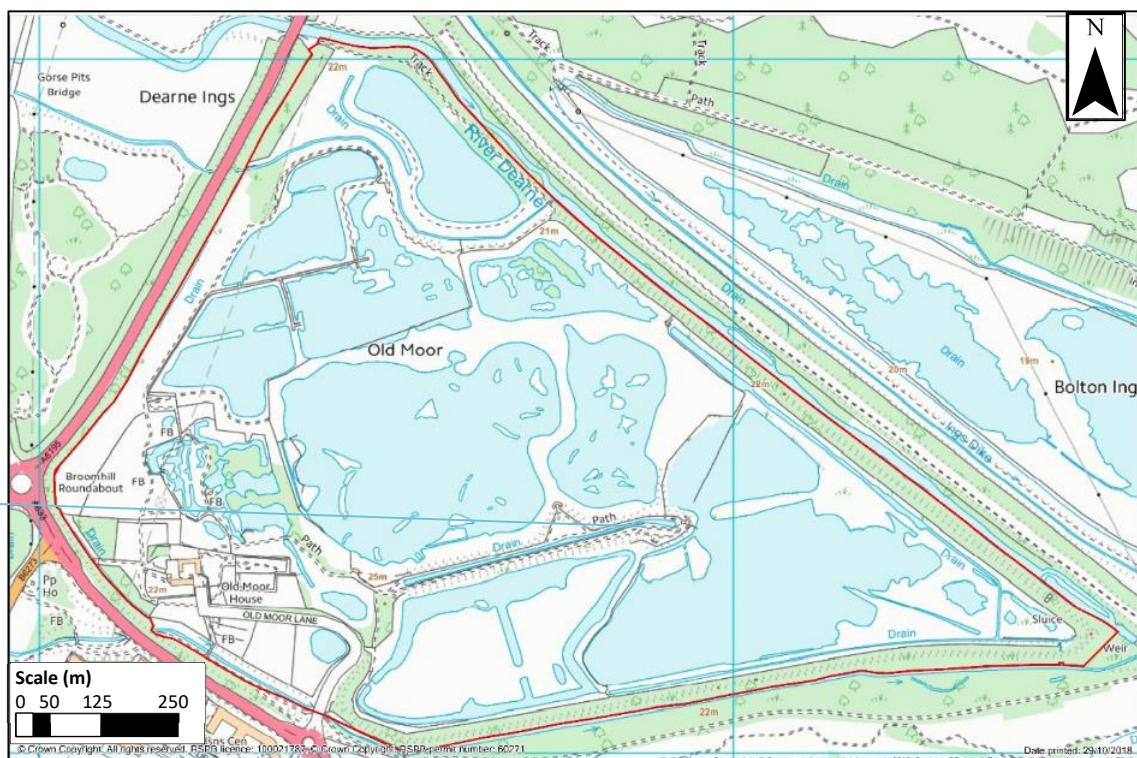


Figure 1-1: Site location plan (OS OpenData 2018)

1.2 Scope

The RSPB have commissioned JBA Consulting (JBA) to produce a geoenvironmental and geotechnical desk study for the proposed works at RSPB Dearne Valley Old Moor.

The scope of this report is to summarise ground conditions at the site using existing data and identify significant geoenvironmental and geotechnical hazards which may affect the construction or operation of the proposed works

2 Site Information

2.1 Site Description

The site is on a floodplain to the south of the south-east flowing River Dearne. Ground elevations at the site is generally decrease towards the south from approximately 23mAOD to approximately 18mAOD. The higher topography recorded in the north of the site is associated with an embankment (Figure 2-2).

The site is an RSPB Reserve split into seven (7No.) habitat areas and a visitors centre with associated car park and infrastructure.

The site boundaries and the land surrounding the site comprise:

- The River Dearne lies immediately to the north of the site, forming its northern boundary, with a dismantled railway, undeveloped land and farmland beyond.
- Knoll Beck forms the south-east site perimeter, and Manvers Way forms the south-west site perimeter, with industrial land beyond in the south and south-east, and residential land in the south-west.
- To the east of the site is a golf course with residential land beyond.
- The western site perimeter is formed by the A6195. Further west of the site is Broomhill Park, with residential and agricultural land beyond.

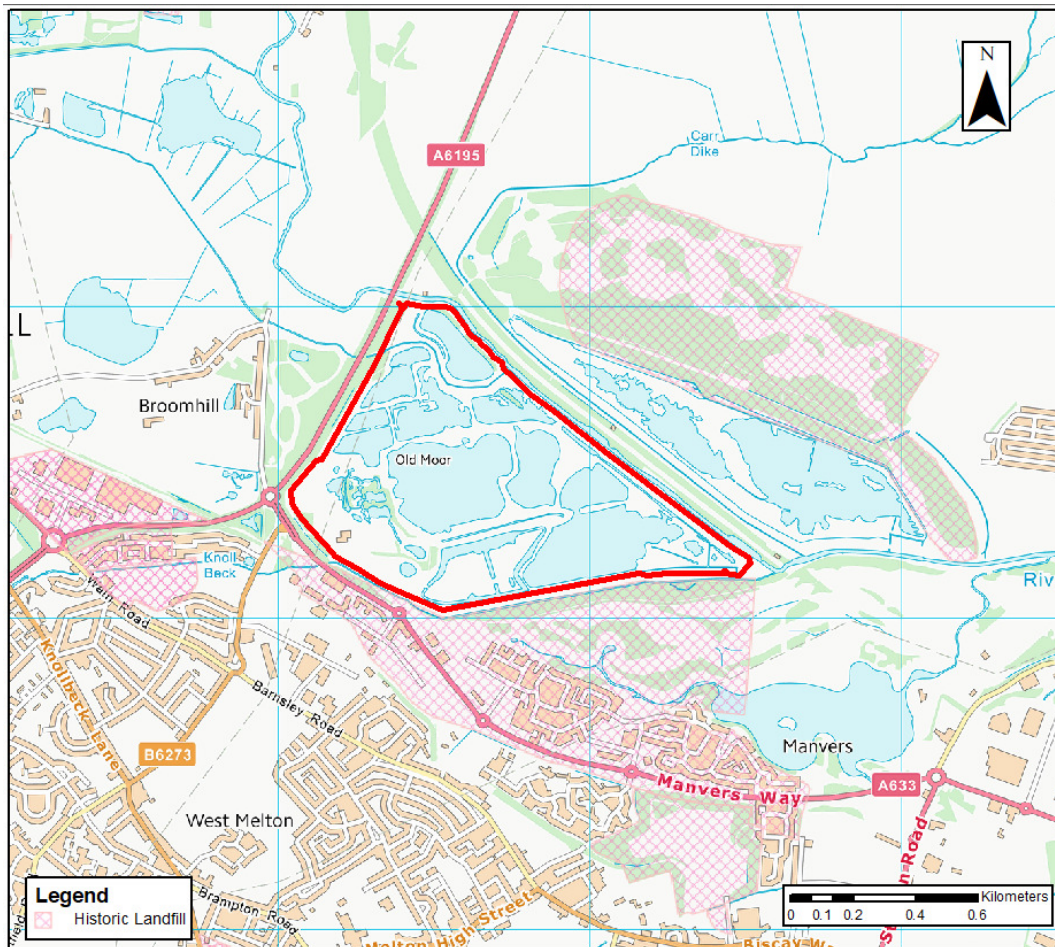


Figure 2-1: Old Moor OS map (2018) with historic landfill map

2.2 Site History

The following summary is based on the historical maps (Appendix A) for the site and the surrounding area (dated 1854 to 2018; Google Earth, 2018; Envirocheck, 2018):

2.2.1 On site

- The site was recorded as agricultural land associated with Old Moor House from 1854 until 1967. Knoll Beck and the South Yorkshire Railway (until 1989) were recorded to the south-east and south-west of the site respectively.
- The 20mAOD contour is recorded to dissect the site in 1980, suggesting a slight overall fall in topography towards the north-west.
- The Old Moor Nature Reserve is recorded as a wetland from 2000.

2.3 Surrounding site area

- The north of the site (between Bulling Dike and the River Dearne) was recorded as subject to floods in 1854, and liable to floods from 1893 until 1938.

- The River Dearne was recorded as the northern site perimeter, with the London Midland & Scottish Railway beyond (until 1989). Bulling Dyke, flowing east, is recorded to cross the site before joining the River Dearne on the northern site boundary.
- A golf course is recorded south-east of the site after 2000.
- A railway line was recorded 300m east of the site from 1854 until 1989.
- Wath upon Dearne Main Colliery was recorded from before 1854 until 1989. The associated colliery spoil was deposited immediately south of the site (beyond Knoll Beck) and 80m north of the site beyond the River Dearne and the historic railway.

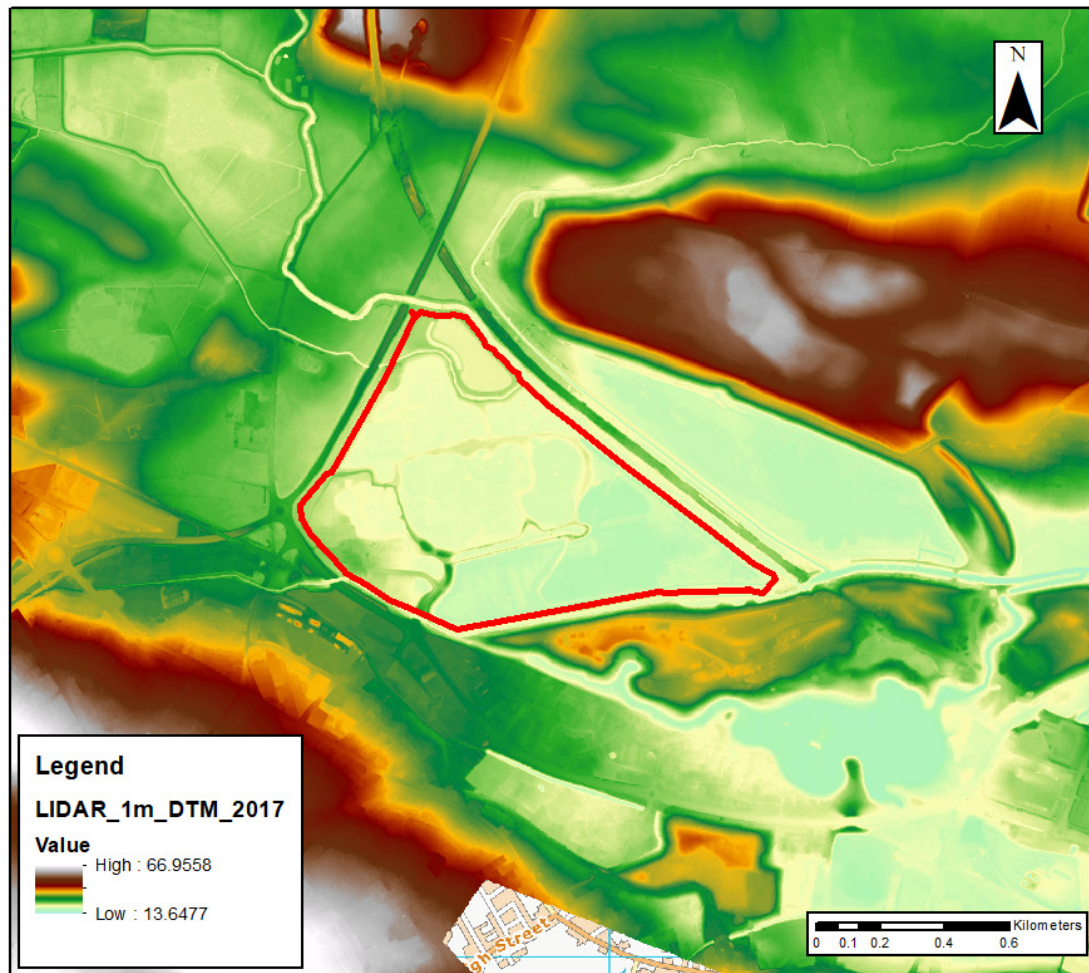


Figure 2-2: Lidar map of Old Moor

2.4 Onsite Environmental Information & Designations

The MAGIC Map online application has been used to identify environmental designations on and surrounding the site, the details of which are described below:

- The south-west, south-east and northern tip of the site are recorded as High Spatial Priority for Woodland Improvement in England. Onsite woodland is recorded as deciduous (Priority Habitat Inventory) and

broadleaved (National Forest Inventory). Young trees are recorded on the central southern and western site perimeters.

- The entire site is recorded to be Dearne Valley RSPB reserve (Non-Statutory).
- The entire site is recorded to be a Coastal and Floodplain Grazing Marsh on the Priority Habitat Inventory with an area of 26Ha.
- The site is not recorded to have any statutory land designations.
- Medium Priority Phosphate Issues are recorded in the south of the site.
- The perimeter of the site is recorded as lower spatial priority for Woodland Water Quality and high spatial priority for Woodland Flood Risk.

2.5 Hydrology

The following information on the hydrology of the site has been obtained from the Environment Agency (EA) Catchment Data Explorer (2018) and the MAGIC Map (2018) online viewer:

- The site is recorded within a Nitrate Vulnerable Zone (NVZ) for surface water; area S278 River Dearne.
- Knoll Beck to confluence with the River Dearne (ID: GB104027057470) is designated as a heavily modified watercourse with moderate overall (good chemical and moderate ecological) quality.
- River Dearne (ID: GB104027063173) is designated as a heavily modified watercourse with moderate overall (good chemical and moderate ecological) quality.
- The north of the site is recorded as a high priority for Flood Risk Management.

2.6 Groundwater

The following information on groundwater at the site has been derived from the BGS GeoIndex Onshore (2018) and the MAGIC Map (2018) online viewers:

- The onsite bedrock and the superficial material onsite are designated as a Secondary A Aquifers.
- Groundwater Vulnerability is designated as minor.
- The site does not lie within a Groundwater Source Protection Zone.

2.7 Mineral Resources

The mineral resources map for South Yorkshire (BGS, 2002) records the following (as indicated in Figure 2-3):

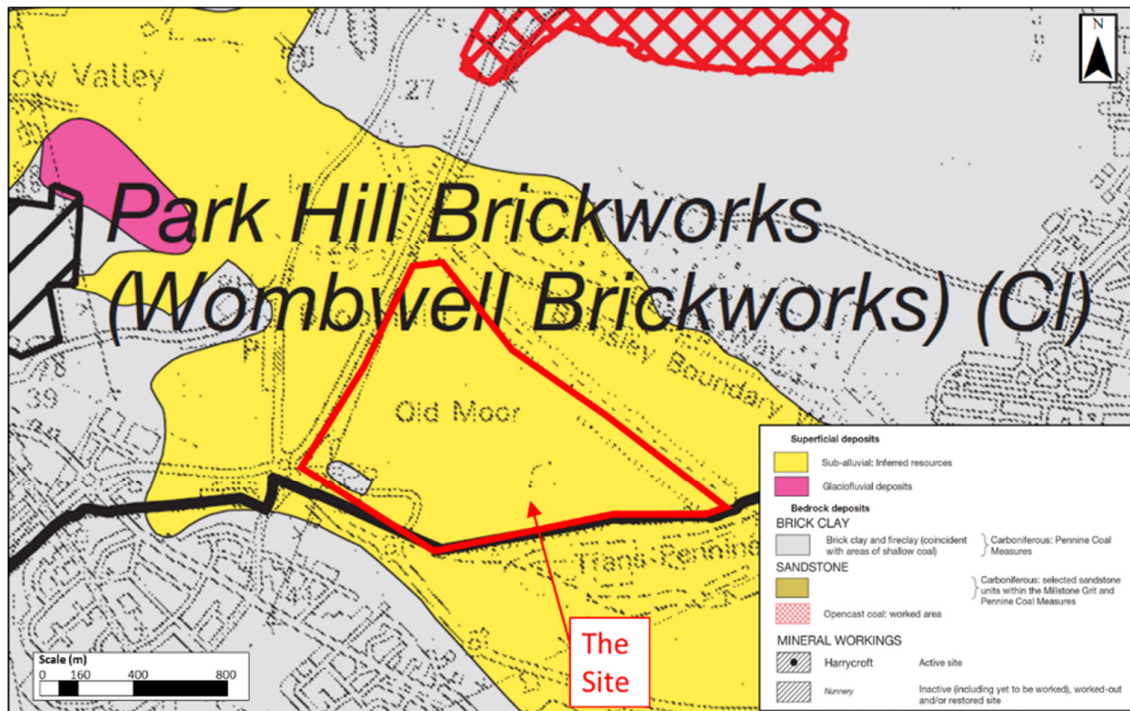
- A sub-alluvial mineral resource beneath the site.
- Potential brick clay recorded beneath the alluvial deposits onsite.
- Glaciofluvial deposits 900m north-west of the site.
- Park Hill (previously Wombwell) Brickworks is recorded as inactive and restored 1km west of the site.

2.8 Coal Mining Legacy

The online viewer of the Coal Authority (2018) records the following coal mine legacy relevant to the site (as indicated in Figure 2-4):

- The site is not in or within 300m of a Development High Risk Area.
- No mine entries are recorded within 100m of the site. The nearest historic mine entries are 4.3m diameter shafts 500m south-east of the site. These shafts were Wath Colliery No.1 and No.2 shafts to 585mbgl and 666mbgl respectively.
- No coal is recorded to sub-crop beneath the site of within 500m of the site.
- Underground workings recorded in coal a minimum of 530m beneath the site dipping around 4° towards the north-north-east.

The shallowest coal seam recorded beneath the site is at -115m AOD.



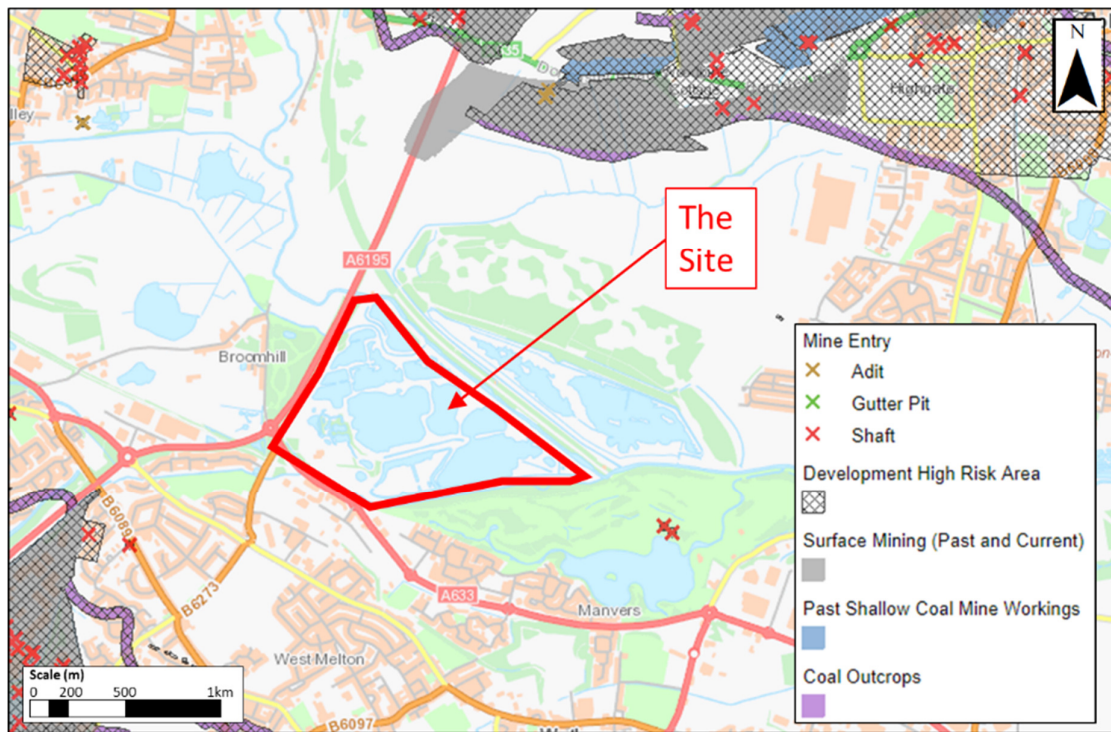


Figure 2-4: The Coal Authority Online Map viewer (2018)

2.1 Radon

Some parts of 1km grid square encompassing the site are recorded to have bands of elevated radon potential to a maximum of between 1-3% (Public Health England, 2018).

2.1 Unexploded Ordnance

The site is in an area considered to have a low risk of UXO (Zetica, 2018).

3 Ground Conditions

The Soilscales UK viewer (2018), the British Geological Survey (BGS), GeoIndex online viewer, the BGS 1:50,000 geological map Sheet 87 'Barnsley' and the BGS online borehole archive have been reviewed to determine the ground conditions anticipated beneath the site.

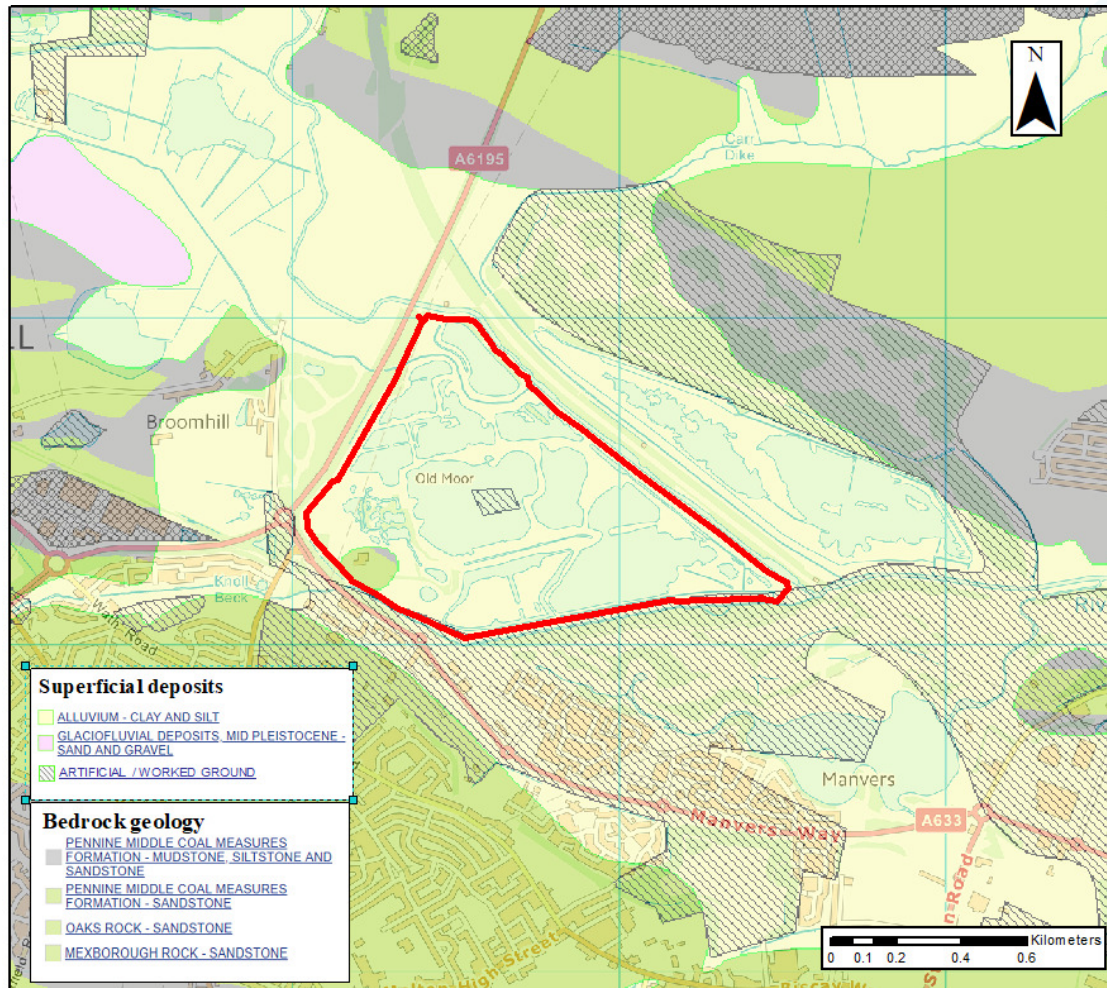


Figure 3-1: BGS (2018) map of bedrock and superficial deposits (OS, 2018)

3.1.1 Superficial Deposits

Loamy and clayey floodplain soils with naturally high groundwater are recorded onsite (Soilscales, 2018).

The British Geological Survey (BGS) records indicate most of the site to be underlain by alluvium superficial deposits comprising clay, silt and potentially interbedded coarser granular materials. Worked ground (potentially an infilled quarry) is recorded immediately south of the site and 100m north of the site (Figure 3-1).

Glaciofluvial strata comprising sand and gravels are recorded north-west of the site.

3.1.2 Bedrock Geology

The site is underlain by the Carboniferous Pennine Middle Coal Measures Formation (Figure 3-2) which consists of interbedded mudstone, siltstone, sandstone and coal. The bedrock recorded beneath the site comprises predominantly mudstone with sandstone in the south-west of the site.

The Oaks Rock sandstone member sub-crops approximately 100m south of the site, and the Mexborough Rock sandstone member is recorded around 600m north of the site.

The Pennine Middle Coal Measures Formation is recorded to be faulted with two main trends (north-west to south-east, and north-east to south-west). The Broomhill fault is recorded in the south-east of the site and accommodates a downthrow towards the south-east.

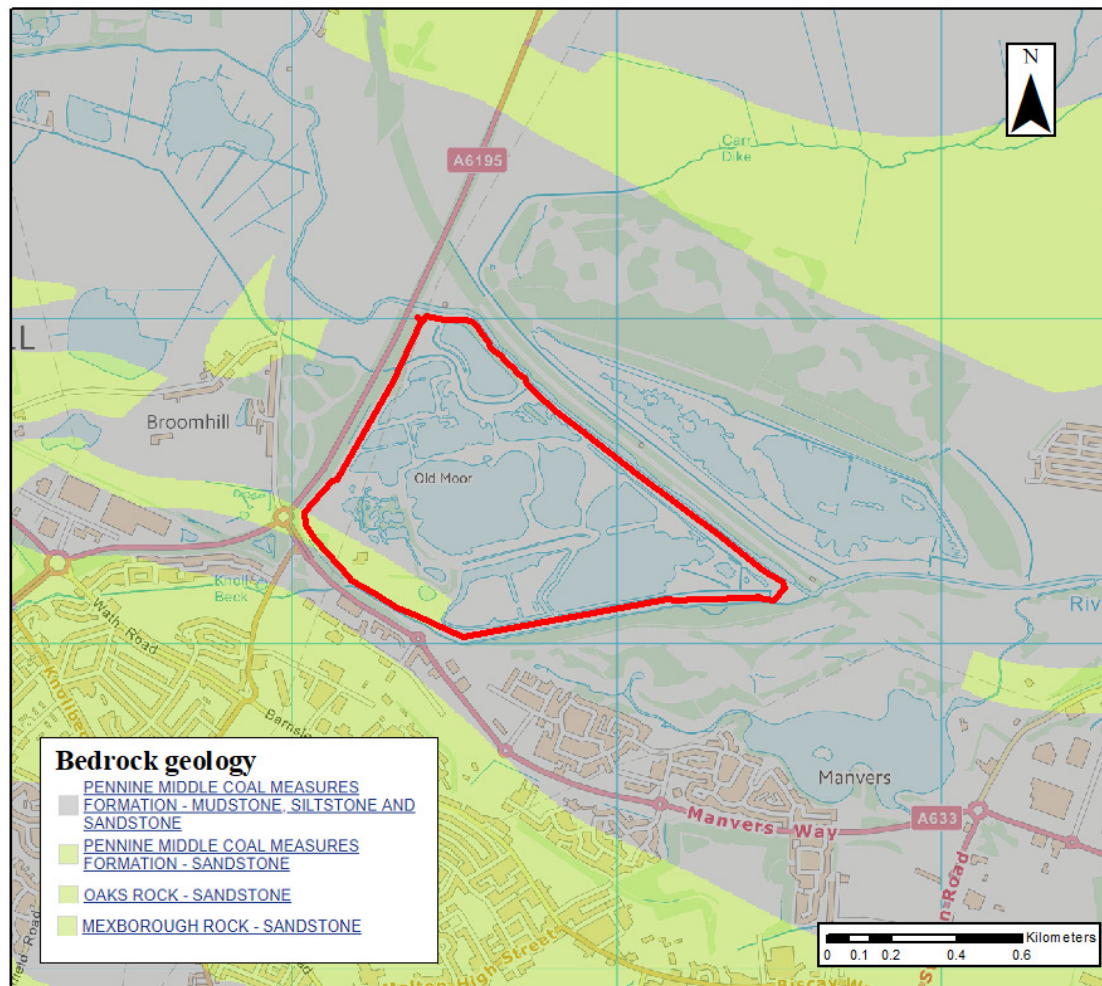


Figure 3-2: BGS (2018) map of bedrock deposits (OS, 2018)

3.2 Previous Ground Investigations

As shown in Figure 3-3 there are two (2No.) historic borehole records onsite. One (1No.) record associated with the South Elmsall to West Melton 275kV electricity line (tower66) is not publicly available. The publicly available BGS borehole records used in this review are presented in Appendix B and summarised below.

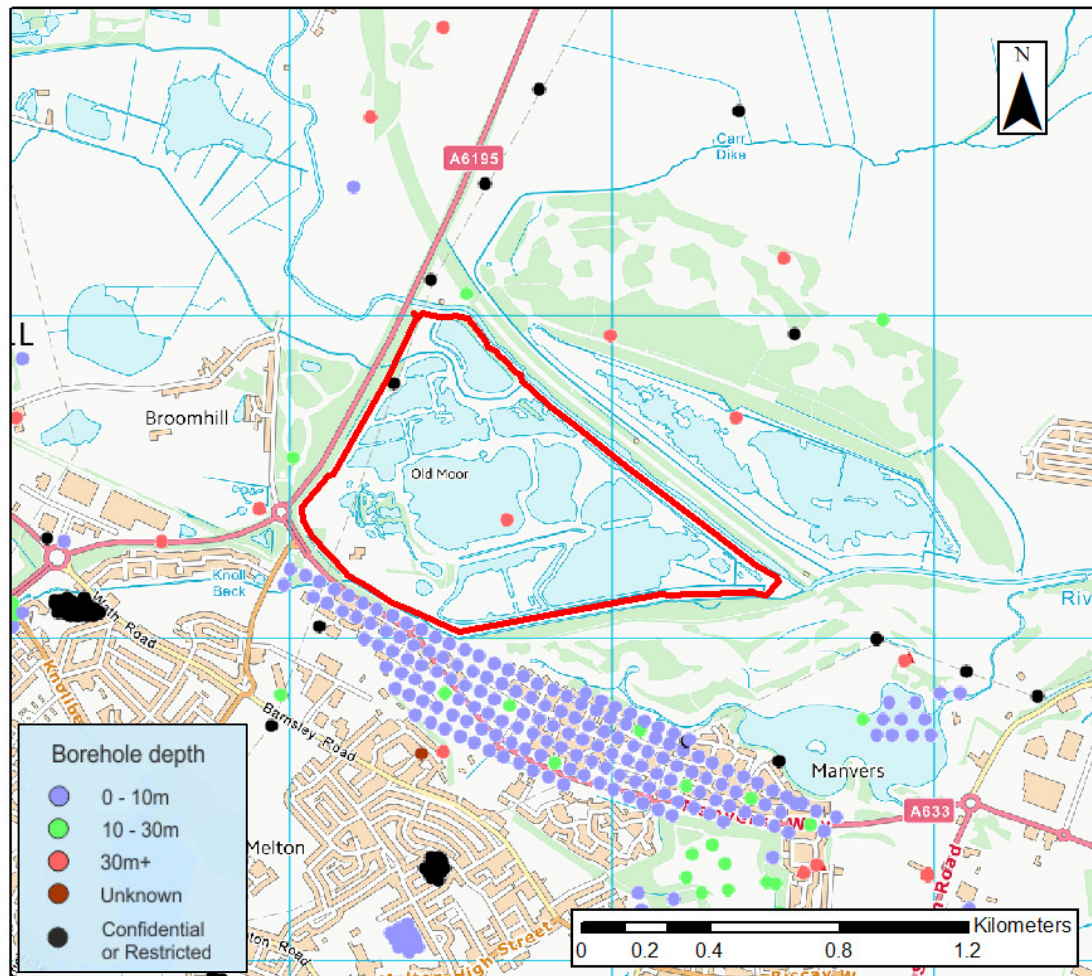


Figure 3-3: Historic borehole records (BGS, 2018)

3.2.1 Wath Colliery

Five (5No.) boreholes associated with Wath Colliery were undertaken between 1970 to 1972. Three (3No.) of which are underground boreholes. Borehole SE40SW43 (Wath Colliery No.11) lies on the site and the others are within 500m of the site. The boreholes formed from the surface were open hole to between 60mbgl and 90mbgl, with no record of superficial strata or the bedrock contact. Ground level in the centre of the site was recorded to be at 19.51mAOD.

3.2.2 Dearne Valley and South Yorkshire Highway

Two (2No.) offsite boreholes are part of the "Barnsley – Doncaster Road" undertaken in 1973. The ground conditions encountered are summarised in Table 3-2

3.2.3 Wath Marshalling Yards

A ground investigation comprising 158No. trial pits and 10No. boreholes was undertaken in 1987. The ground conditions encountered are summarised in Table 3-3.

3.3 Ground Summary

The desktop study assessment has identified a general ground profile as follows (Table 3-1):

- Made ground comprising relatively thin layer of topsoil with colliery spoil of black ash and gravel to the south of the site, beyond Knoll Beck.
- Interbedded soft to stiff clays with occasional thin granular layers (not found to be pervasive across the site).
- Medium dense to very dense gravels, or sand and gravel between 1.0m and 5.5m thick.
- Bedrock of Pennine Middle Coal Measures Formation comprising completely weathered to weathered mudstone and siltstone, interbedded with weathered sandstone.

Table 3-1: Summary of geology beneath the site.

Age	Group	Formation / Member	Description	Thickness (m)
Holocene		Made Ground / Anthropogenic	Topsoil Black Ash and Gravel Yellow Sandstone	0.2 1.1 to 16.5
Quaternary		Alluvium	Soft to firm consolidated, compressible silty clay. Can contain layers of silt, sand, peat and basal gravel.	0.6 to 2.3
		Glaciofluvial Deposits	Sand and Gravel	0.0 to 5.3
Carboniferous	Pennine Middle Coal Measures Formation	Pennine Middle Coal Measures Formation	Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams	+1.2 to +4.2
		Mexborough Rock	Sandstone	1.3 to +1.5

Table 3-2: Summary of Barnsley to Doncaster nearby borehole records

Borehole No	Strata	Top Depth (mbgl)	Thickness (m)	Ground Water Levels (mbgl)	SPT N Value / Remarks
SE40SW225 Barnsley-Doncaster Road, BH10 (60m north of the site)	Grass and Topsoil with some fill.	0.00	0.15	No ground water recorded	None recorded
	Brown clayey Sand.	0.15	0.25		MC – 27% LL – 48% PL – 30% CBRR – 8%
	Firm to stiff light grey and brown mottled, silty sandy Clay with occasional mudstone fragments.	0.40	0.20		MC- 30%
	Iron and carbon-stained heavily weathered and broken grey shaley sandy Mudstone.	0.60	0.15		Not recorded
	Firm to stiff light grey and brown silty Clay.	0.75	0.5		MC – 24% LL – 37% PL – 22% C _u – 30kPa
	Firm but soft in places, ligh grey silty Clay with abundant fragments of mudstone and coal. Sandy below 1.6mbgl.	1.25	0.75		MC – 24% LL – 28% PL – 23% C _u – 30kPa
	Dark brown clayey medium and coarse-grained Sand with fine sub-rounded gravel of sandstone and mudstone. Very clayey band at 3.8mbgl.	2.00	2.60		MC – 15-16% N – 13-16
	Firm dark brown very sandy Clay with some gravel.	4.60	0.20		MC – 15% N – 20
	Stiff dark grey silty sandy Clay with gravel and fragments of sandstone and mudstone.	4.80	0.95		MC – 15-23% LL – 25-49% PL – 23-28% C _u – 108kPa
	Dark grey shaley silty weathered Mudstone.	5.75	1.10		MC – 9% LL – 25% PL – 18%
	Light grey fine grained fractured Sandstone	6.85	0.25		MC – 6-8% N > 250
	Dark grey fractured silty shaley Mudstone with thin bands of fine grained fractured sandstone. Slightly coaly at 10mbgl.	7.10	4.10		Recovery +90% RQD – 0%

Borehole No	Strata	Top Depth (mbgl)	Thickness (m)	Ground Water Levels (mbgl)	SPT N Value / Remarks
SE40SW226 Barnsley-Doncaster Road, BH11 (120m east of the site)	Grass Topsoil.	0.00	0.10		Not recorded
	Brown friable sandy clay.	0.10	0.60		MC – 23% LL – 57% PL – 42%
	Firm to soft brown and grey mottled Clay with occasional fragments of shaley mudstone.	0.70	0.90		MC – 46% LL – 49% PL – 27% Cu – 16kPa
	Dark brown very clayey sand and sandy Clay.	1.60	0.40		MC – 46% LL – 50% PL – 36%
	Very soft to soft light grey to grey and grey very silty Clay with rare gravel, fragments of weathered mudstone. Traces of peat from 3.1mbgl to 3.2mbgl, becoming abundant from 3.2mbgl to 3.35mbgl.	2.00	1.6		MC – 32-69% LL – 33-67% PL – 24-36% Cu – 6-12kPa
	Firm light grey and brown mottled, silty sandy Clay and occasional gravel.	3.60	4.30		MC – 17-28%
	Dark brown medium and coarse-grained Sand with fine to medium rounded to sub-rounded gravel.	4.30	3.75		MC – 11-17% N – 28
	Light brown fine grained shaley weathered sandstone.	8.05	0.20		MC – 18% N – 53
	Light becoming dark grey (11.0mbgl), heavily weathered (until 11.0mbgl) silty shaley mudstone.	8.25	3.60		MC – 9-20% LL – 28-47% PL – 20-25% N – 52
	Coal	11.85	0.80		Recovery +95% RQD – 20%
	Light grey sandy mudstone, weathered in parts.	12.65	2.30		Recovery +60% RQD – 10%
	Dark grey very sandy Mudstone with bands of fine grained muddy sandstone and some weathered bands.	14.95	2.80		Recovery 100% RQD – 35-60%

Notes: BH – borehole, MC – moisture content, PL- plastic limit, LL – liquid limit, N – SPT blowcount, RQD – rock quality designation of core

Table 3-3: Summary of Wath Marshalling Yards historic ground investigation

Strata	Trial Pits SE40SW249- SE40SW406	SE40SW- 239	SE40SW- 240	SE40SW- 241	SE40SW- 242	SE40SW- 243	SE40SW- 244	SE40SW- 245	SE40SW- 246	SE40SW- 247	SE40SW- 248
Depth range (mbgl)											
Made Ground	0.0 to 4.3	0.0 to 2.2 (N 18 to 22)	0.0 to 1.5 (N 8)	0.0 to 1.5 (N 7)	0.0 to 3.5 (N 17 to 21)	0.0 to 16.0 (N 14 to refusal)	0.0 to 6.3 (N 6 to 27)	0.0 to 2.4 (N 3)	0.0 to 1.9 (N 14)	0.0 to 2.2	0.0 to 1.1
Yellow Sandstone	0.4 to 1.9	-	-	-	-	-	-	-	-	-	-
Topsoil	0.0 to 0.4	-	-	-	-	-	-	-	-	-	-
Grey & light brown Silty Clay	0.4 to 2.3 (soft-firm)	2.2 to 3.7 (soft to firm)	1.5 to 3.4 (soft to stiff, Sand & Gravel 2.3 to 2.8)	1.5 to 4.9 (soft to firm, gravelly sand 4.3 to 4.7)	3.5 to 4.8 (firm)	-	6.3 to 11.3 (firm to stiff with gravel)	2.4 to 7.8 (soft to firm, stiff from 3.4, gravelly 4.9)	1.9 to 2.5 (soft with gravel)	2.2 to 4.0 (firm to stiff)	1.1 to 3.4 (soft to firm) (gravel from 1.4)
Gravel	-	3.7 to 8.5 (fine to medium & medium to coarse Sand, N 15 to 20)	3.4 to 8.3 (fine to medium & fine to coarse Sand, N 11 to 22)	4.9 to 8.7 (N 15 to 25)	4.8 to 10.3 (fine to medium & fine to coarse Sand, N 19 to 24)	-	11.3 to 13.0 (& Sand, N 105)	7.8 to 10.0 (& Sand, N 49 to 45)	2.5 to 3.5 (clayey, N 20)	-	-
Weathered Mud/Siltstone	-	8.5 to 9.7 10.2 to 12.0 (N 117 to refusal)	8.3 to 11.0 (N 65 to refusal)	8.7 to 12.6 (N refusal)	10.3 to 13.5 (N 88 to 129)	-	13.0 to 14.2 (N refusal)	-	3.5 to 7.7 (N 22 to 107)	4.0 to 8.0 (N 77 to 86)	3.4 to 7.2 (N 73 to 90) (coal partings 3.4 to 3.8)
Weathered Sandstone	-	9.7 to 10.2 (N 92)	-	-	-	-	-	10.0 to 11.5 (N refused)	7.7 to 9.0 (N 110)	-	-
Groundwater	None Recorded	STK 3.7 to 3.3 2.7 Standing	2.3 Standing	STK 4.3 to 3.7 3.2 Standing	4.8 Seep 3.1 Standing	None Recorded	13.0 Seep	2.6 Seep STK 10.2 to 9.6	STK 2.5 to 2.3	None Recorded	STK 3.5 to 2.1

4 Preliminary Environmental Assessment

The potential sources pathways and receptors onsite are listed in Table 4-1.

Table 4-1: Summary of potential contamination sources, receptors and pathways

Source	Position	Receptor	Potential Pathway
Historic Farmland	Onsite	Ecology	Overland flow, transportation via surface watercourses, migration via drainage, baseflow
		Current and Future Site Users	Direct contact, inhalation, accidental ingestion
		Construction Workers	Direct contact, inhalation, accidental ingestion
Historic colliery spoil landfill to the southwest, previously Wath Marshalling Yards	Offsite	Ecology	Overland flow, transportation via surface watercourses, migration via drainage, baseflow
Farmland surrounding site		Surface Waters (Bulling Dike, River Dearne, River Dove)	Overland flow, migration via drainage, baseflow
Disused railway to the north of the site		Groundwater (Secondary A Aquifers)	Migration via permeable strata
		General Public	Direct contact, inhalation, accidental ingestion

4.1 Preliminary Environmental Assessment Recommendations

A preliminary environmental qualitative assessment for the potential source-pathway-receptor (SPR) linkages would be based on Defra (Defra, 2011) and CIRIA guidance (CIRIA, 2001). This would involve the production of a conceptual site model to determine the hazard of a complete SPR linkage, each being a product of the following:

- The likelihood of an event (probability - takes into account both the presence of the hazard and the receptor, as well as the integrity of the pathway);
- The severity of the potential consequence (takes into account both the potential severity of the hazard and the sensitivity of the receptor).

During the ground investigation, the following environmental samples should be collected (with method statements and risk assessments ensuring samples are collected safely):

- Soil samples of the made ground and natural ground immediately beneath.
- Surface water samples from any standing water onsite, and water samples from the upstream, downstream and midstream of the three (2No.) watercourses surrounding the site (River Dearne and Knoll Beck).
- Groundwater samples if there is any significant inflow into exploratory positions.

5 Preliminary Engineering Assessment

The current scope of works is to improve the habitat by undertaking the following elements: reprofiling some of the banks, construction of a pavement with viewpoints, and the construction of some islands including in the heronry.

A preliminary engineering assessment for the proposed works, with regards to the geotechnical risks and hazards, has been made based on information contained within this report. A geotechnical risk register is presented in Appendix C.

It should be noted that the works methodology states that prior to construction "the water levels will be lowered to make the work accessible and for working in a safer environment" (RSPB, 2018).

5.1 Earthworks

5.1.1 Re-profiling of banks

The re-profiling in different areas of the site will produce a volume of material comprising up to four (4No.) strata groups (made ground, interbedded alluvium, glaciofluvial sand and gravels, Pennine Middle Coal Measures bedrock of mudstone and sandstone). The quantity of each type of material excavated will depend on the base level of the excavation and the ground conditions encountered. Bulking of the excavated material will occur, and should be accounted for in the earthworks operations, especially when determining the amount of material that is to be transported from the site.

The stability of the re-profiled slopes will be a function of the ground conditions encountered in each area. Soft and loose, water bearing strata are anticipated to be beneath the site. Any high angled slopes (greater than 20°) with a high groundwater table are unlikely to be stable without retention or re-enforcement. Long term stability may require permanent control of seepage flows on the slopes.

5.1.2 Pavement and viewpoint construction

The central area of the site where the new pavement is to be constructed may require investigation to determine the bearing capacity and risk of settlement of the ground under the weight of the proposed infrastructure. These elements of design can be informed by ground investigation.

5.1.3 Island Construction

The movement of the material excavated in the formation of the re-profiling around the site, will require a Material Management Plan (MMP). This will inform how some of the spoil will be used to construct two shallow islands that are to be constructed in the larger body standing water in the centre of the site. The soft, wet ground area will be difficult for large plant to access.

During construction of the islands, the placed material will surcharge the ground and is likely to induce time dependent settlement. The construction of the islands should therefore be undertaken in stages, with an allowance of sufficient material to ensure the proposed target levels are maintained.

It should be noted that a material management plan (MMP) and the application for the appropriate licenses to export material from the Wombwell Ings and import material into Old Moor should be undertaken on completion of the ground investigation report following the recommended factual ground investigation.

6 Recommendations

The risks outlined in the geotechnical risk register (GRR) include the potential to induce failure of the existing flood embankment, settlement of islands in the centre of the site, contamination from offsite sources, contamination during the proposed works, unrecorded underground services. In order to undertake a geotechnical assessment that would enable the assessment and mitigation (where feasible) of the risks outlined in the GRR, an intrusive ground investigation and site walkover are recommended.

The intrusive ground investigation is to be confirmed following a site walkover, but preliminary recommendations include:

- 5No. dynamic (windowless) sampling boreholes in the location of the proposed visitor infrastructure, with 1No. on the viewpoint.
- 15No. excavated trial pits distributed around the areas of proposed works across the site.
- In-situ tests on soil samples to include standard penetration tests and hand shear vanes.
- Geotechnical and geoenvironmental testing on samples acquired during the intrusive ground investigation.

Additionally, sufficient notice should be allowed for to permission from the Local Authority to import the spoil onto the site from Wombwell Ings, and from the EA to undertake the works adjacent to the flood embankment in the north of the site.

Appendices

A Historical Maps

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		Minor Roads		
	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				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	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
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		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
	Civil Parish		
	BP, BS Boundary Post or Stone		Police Station
	Church		Post Office
	Club House		Public Convenience
	Fire Engine Station		Public House
	Foot Bridge		Signal Box
	Fountain		Spring
	Guide Post		Telephone Call Box
	Mile Post		Telephone Call Post
	Mile Stone		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
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	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

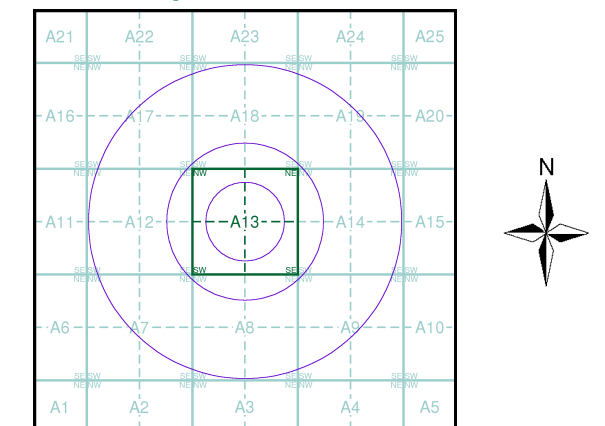
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:10,560	1854 - 1855	2
Yorkshire	1:10,560	1893	3
Yorkshire	1:10,560	1894	4
Yorkshire	1:10,560	1905 - 1907	5
Yorkshire	1:10,560	1931 - 1932	6
Yorkshire	1:10,560	1938	7
Yorkshire	1:10,560	1938 - 1950	8
Yorkshire	1:10,560	1948	9
Ordnance Survey Plan	1:10,000	1956	10
Ordnance Survey Plan	1:10,000	1967	11
Ordnance Survey Plan	1:10,000	1980	12
Ordnance Survey Plan	1:10,000	1989	13
10K Raster Mapping	1:10,000	2000	14
Street View	Variable		15

Historical Map - Slice A



Order Details

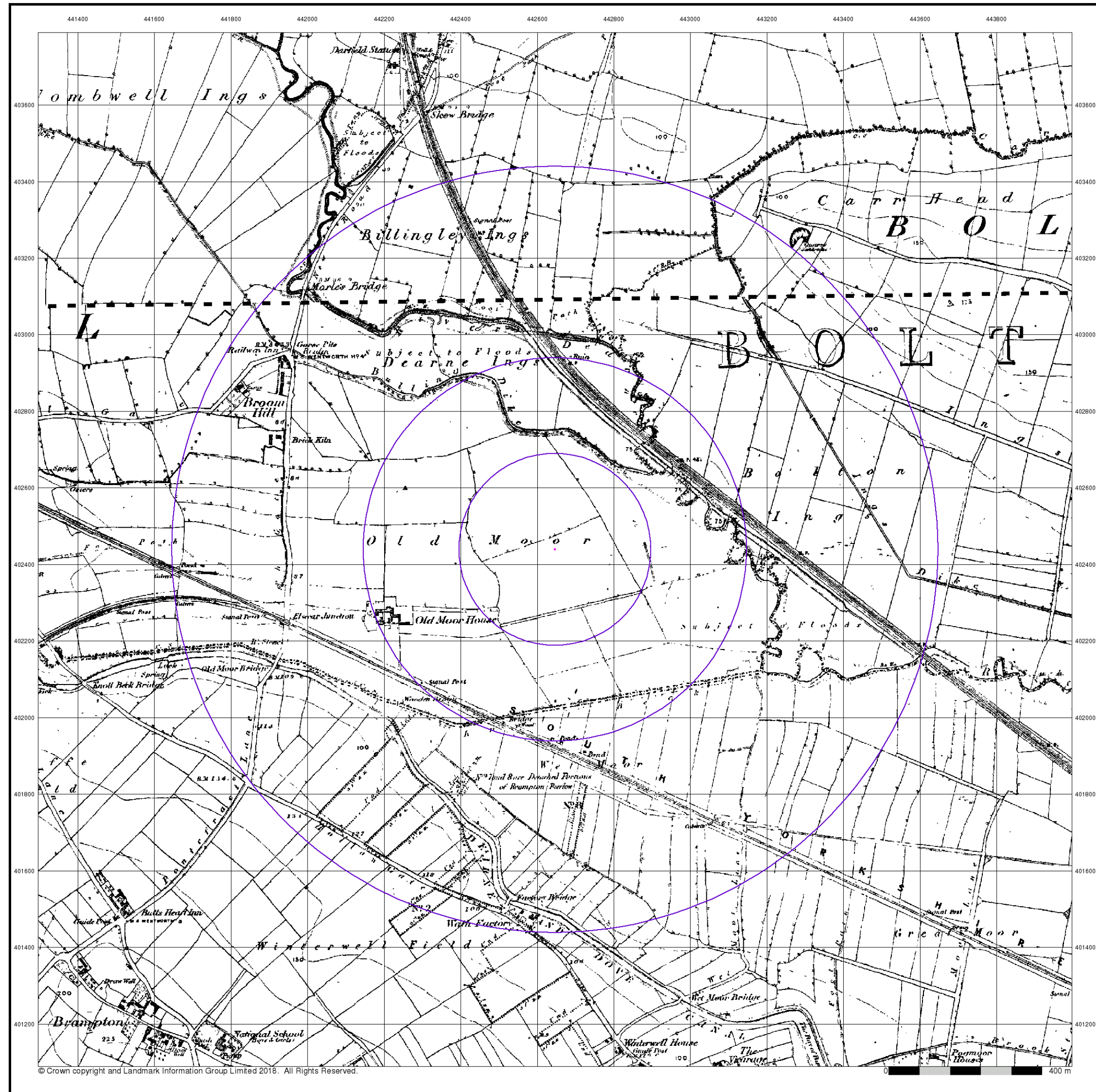
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Search Buffer (m): 1000

Site Details

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Yorkshire

Published 1854 - 1855

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)

27500	1854	1:10,560
28300	1855	1:10,560

Historical Map - Slice A

Order Details

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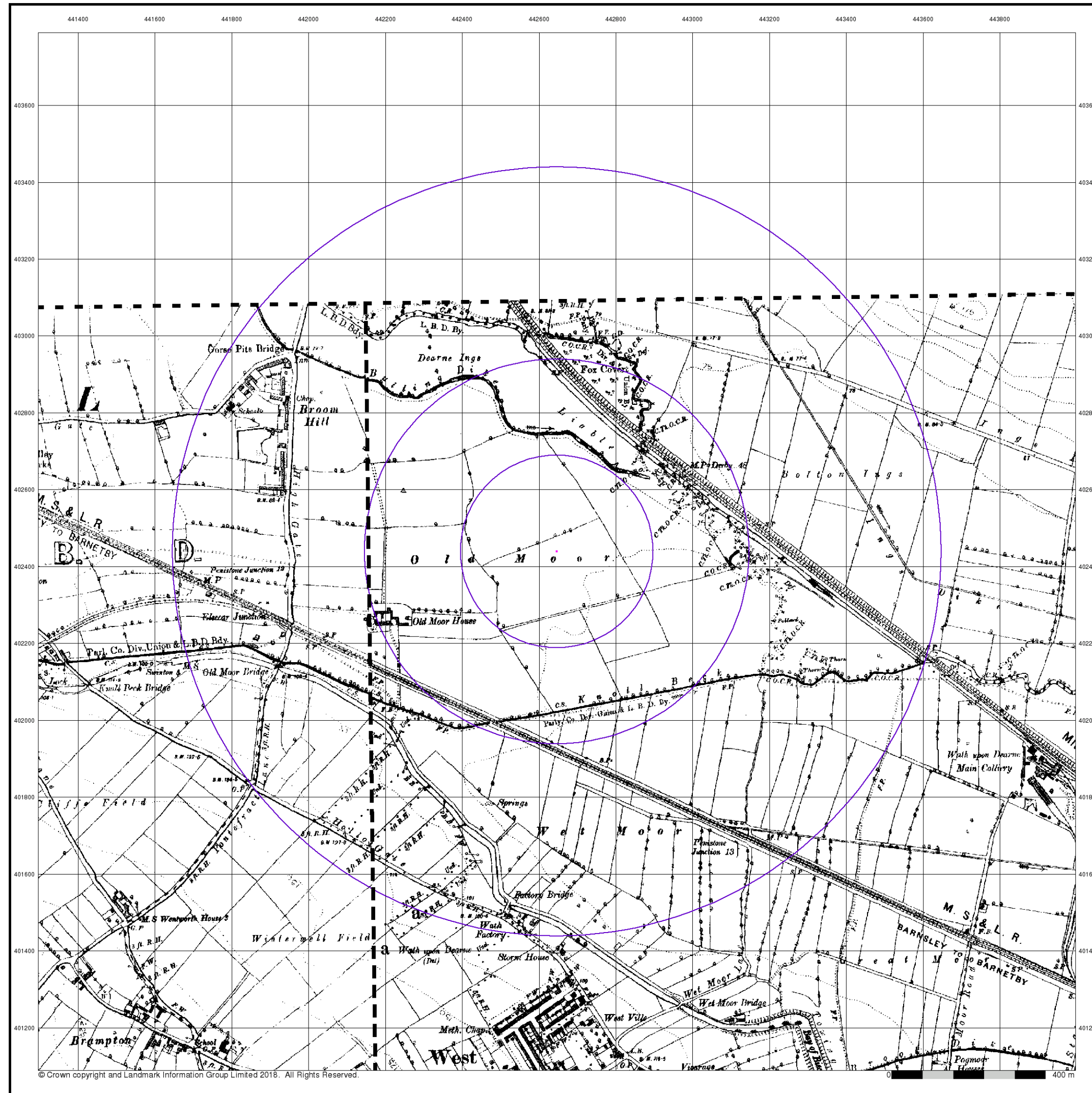
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Yorkshire

Published 1893

Source map scale - 1:10,560

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Map Name(s) and Date(s)

283NW
1893
1:10,560

283NE
1893
1:10,560

Historical Map - Slice A

A21A22A23A24A25

A16A17A18A19A20

A11A12A13A14A15

A6A7A8A9A10

A1A2A3A4A5

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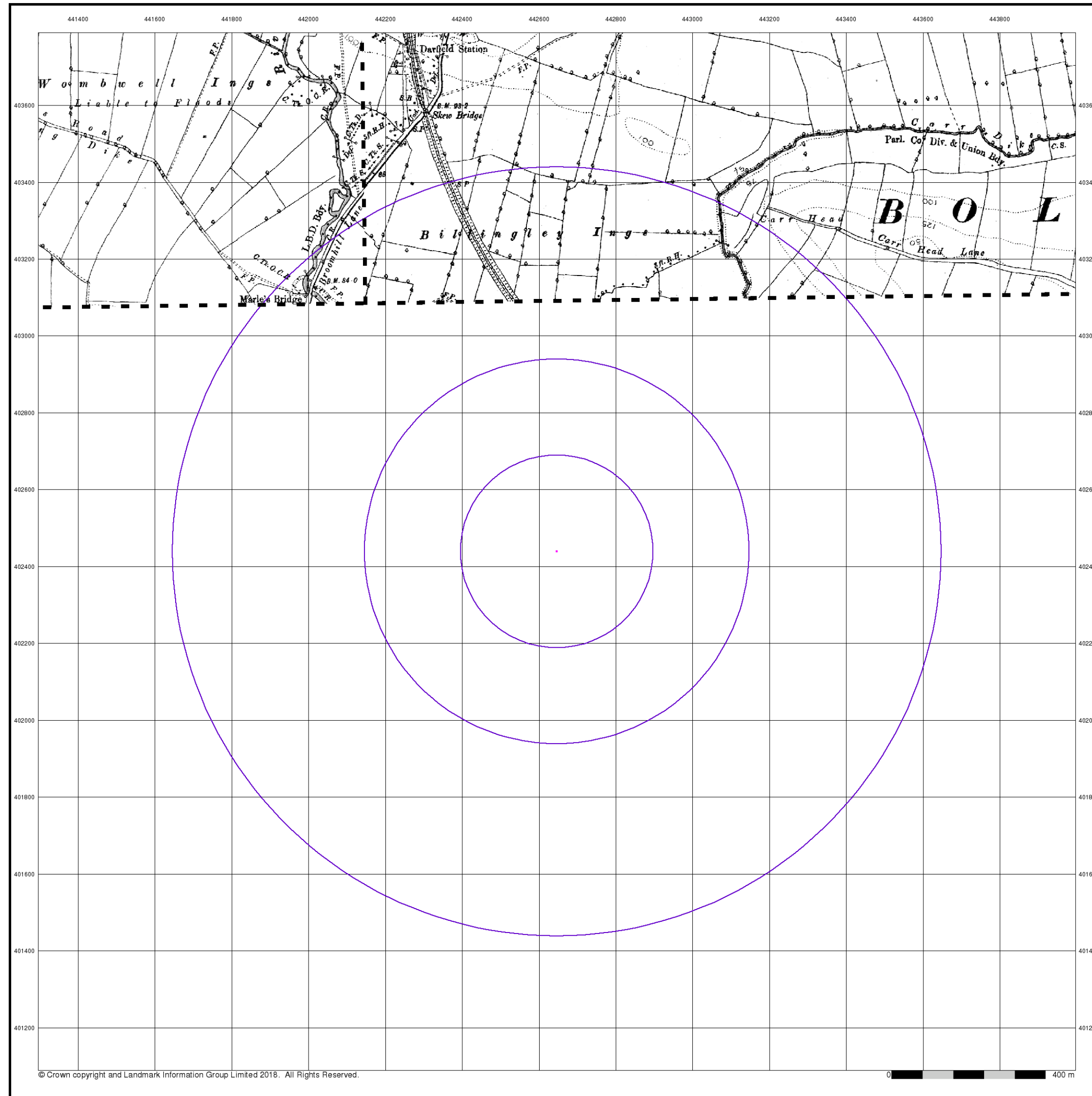
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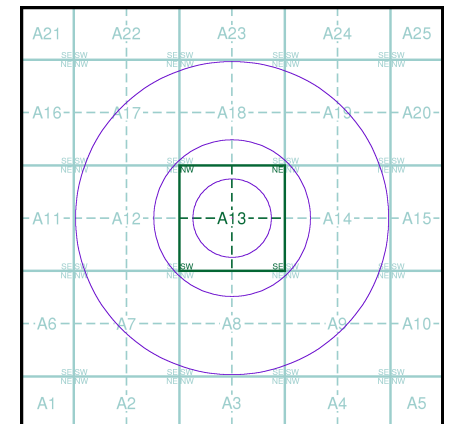


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Map Name(s) and Date(s)

275SW 1894 1:10,560	275SE 1894 1:10,560
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Historical Map - Slice A

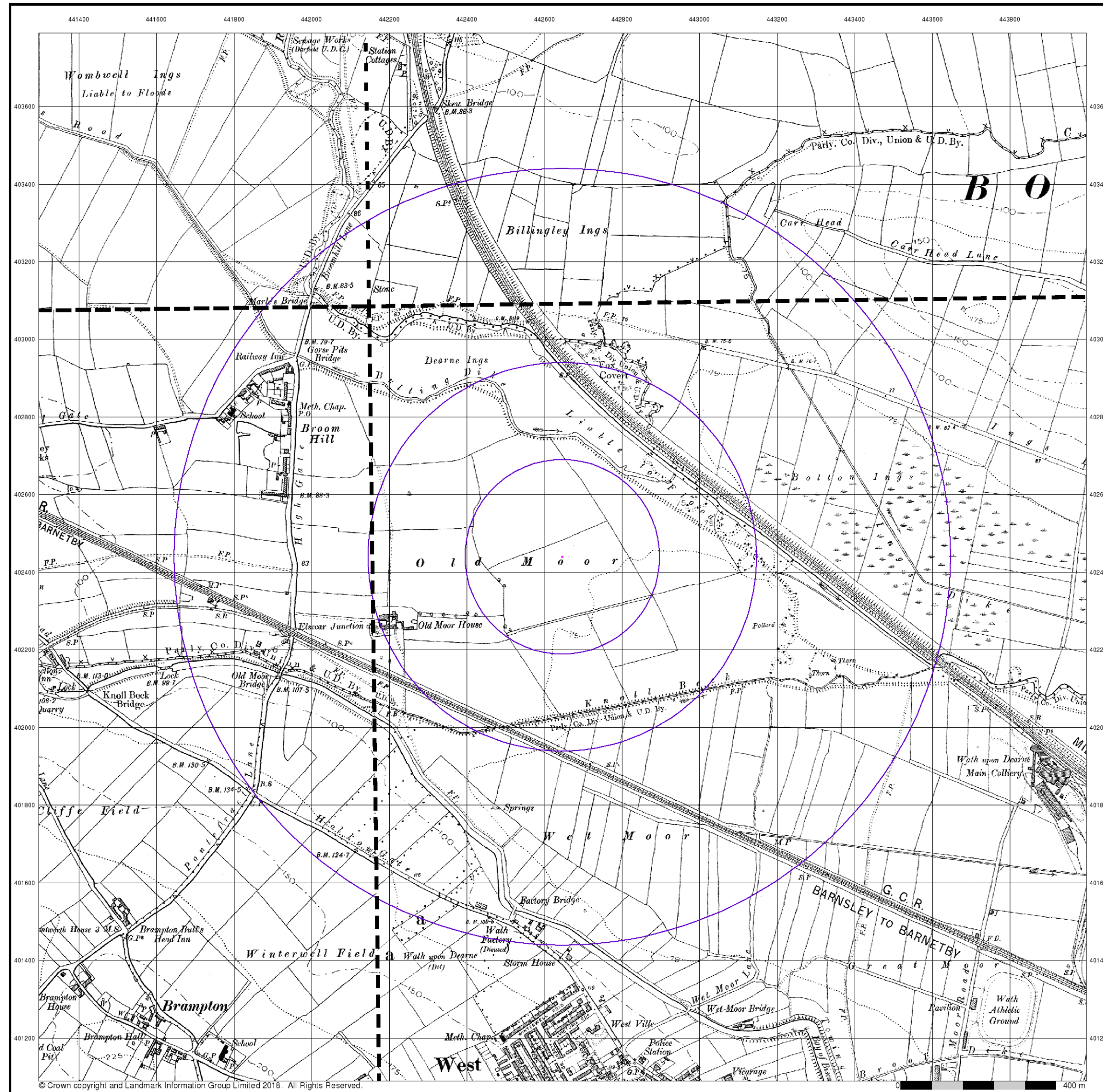


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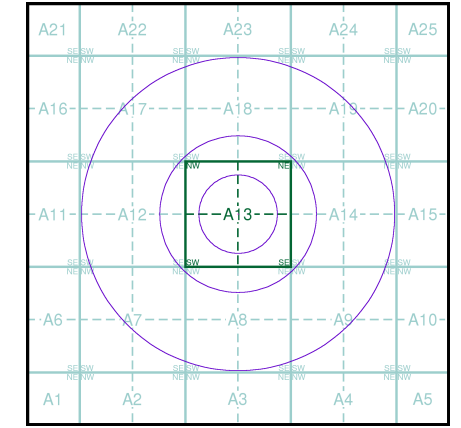
Source map scale - 1:10,560

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)

275SW 1907 1:10,560	275SE 1906 1:10,560
283NW 1905 1:10,560	283NE 1905 1:10,560

Historical Map - Slice A



Order Details

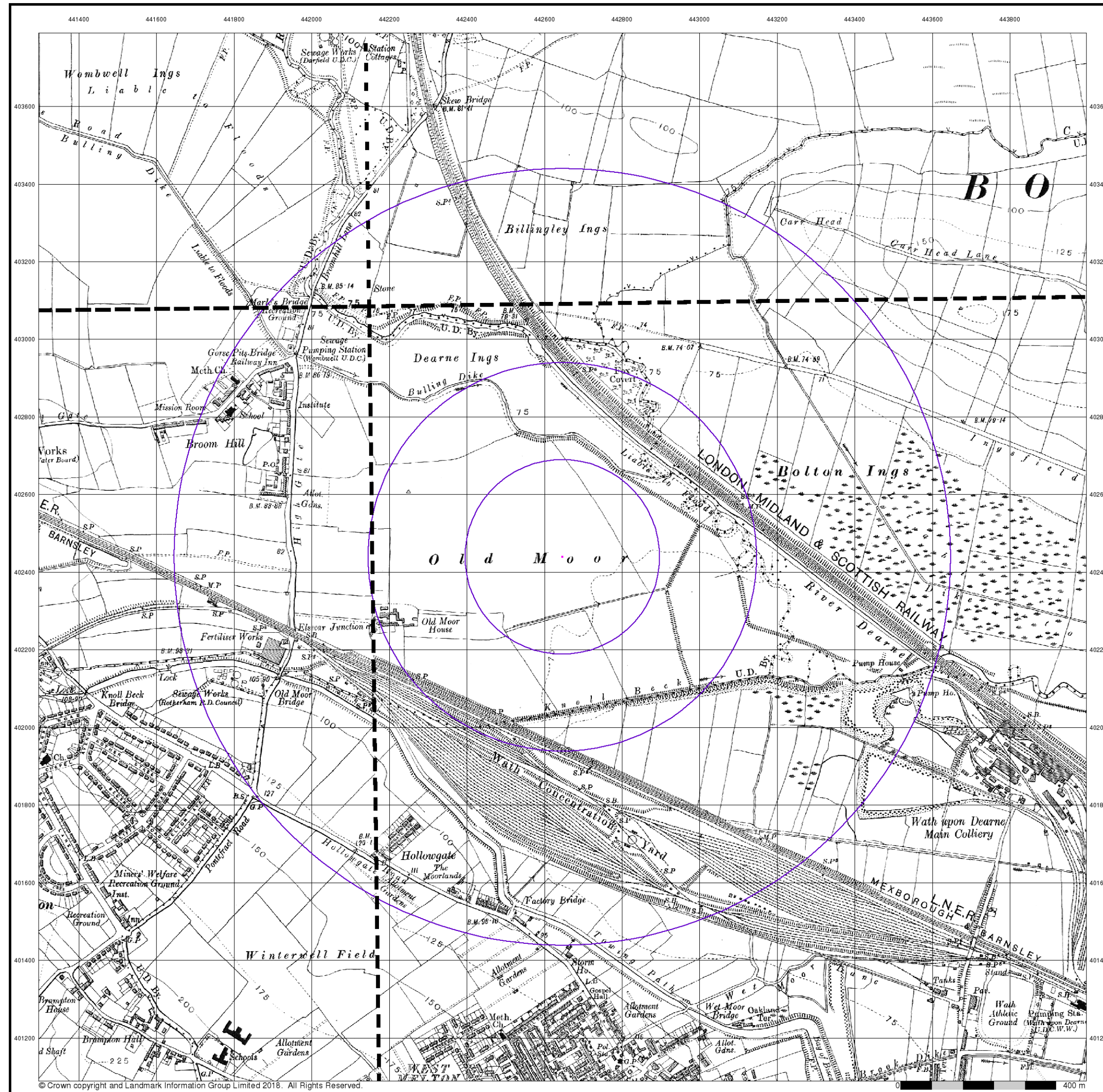
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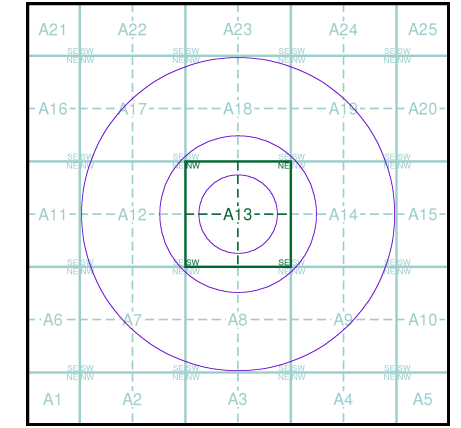
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Map Name(s) and Date(s)

275SW 1931 1:10,560	275SE 1931 1:10,560
283NW 1931 1:10,560	283NE 1932 1:10,560

Historical Map - Slice A



Order Details

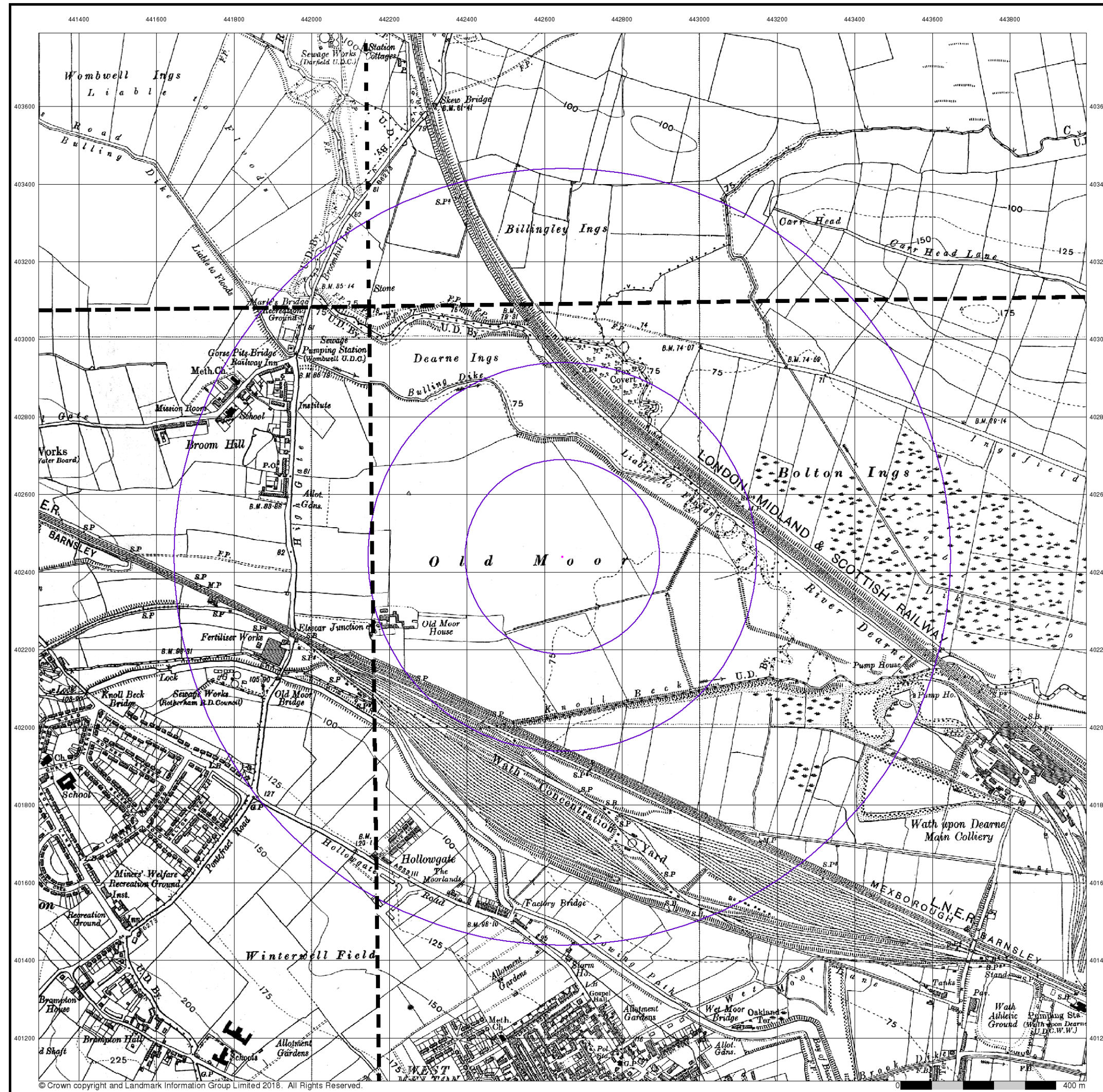
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Published 1938

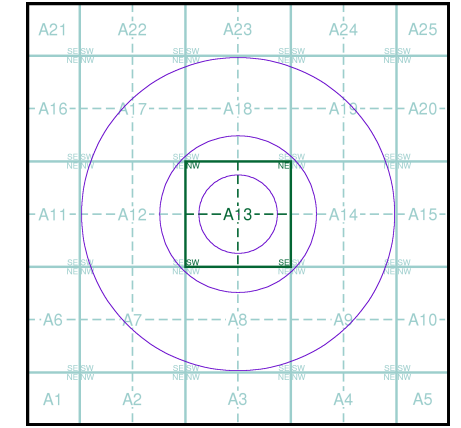
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Map Name(s) and Date(s)

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

Historical Map - Slice A



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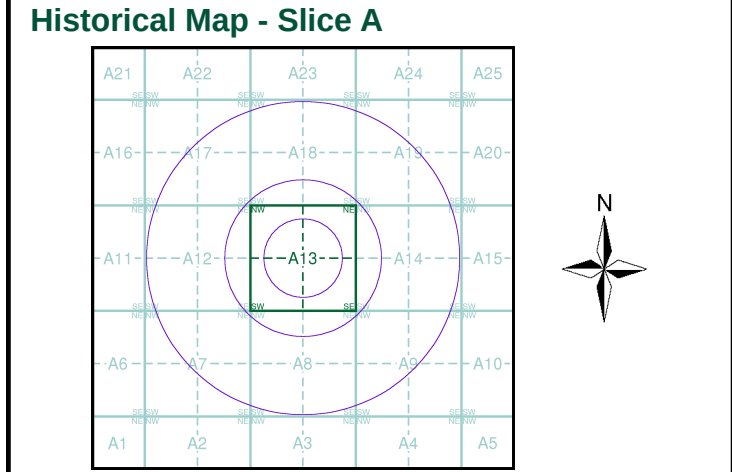
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Yorkshire
Published 1938 - 1950
Source map scale - 1:10,560

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Map Name(s) and Date(s)			
275SW	1938	275SE	1948
1:10,560		1:10,560	
283NW	1948	283NE	1950
1:10,560		1:10,560	



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