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APPLiED GEOLOGY

DESK STUDY & PHASE I COAL MINING RISK ASSESSMENT FOR PARKSIDE, HOYLAND

REPORT STATUS SHEET

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- Site Location Plan (Drawing No. AG3080D-20-01)
- Land for Sports Facilities, Proposed Phase 1 and Phase 2 works (pHp Architects Drawing No. 4400 SP002 Rev P3)
- Proposed Levels (RPS Drawing HOYLA-RPS-SI-XX-DR-C-1651 Rev P1)
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APPENDIX B **DESK STUDY DATA**

- Historical OS Maps
- Groundsure Report
- MAGIC Maps
- Coal Authority Consultants Mining Report (Ref. 51002292341001)
- Coal Authority Mine Abandonment Plans (NE419 Sheets 1-5, NE820, M796 & 5843 1 of 1 Part A)

1.0 INTRODUCTION

An area of land between Sheffield Road and Stead Lane, to the south of Hoyland Common near Barnsley (the site) is to be developed by Newlands Developments (the Client). The proposals comprise the construction of football pitches and an archery pitch, temporary car parking and a temporary container pod for changing facilities, refreshments etc. There will be some cut and fill to create level platforms for the pitches. The development will be carried out in two phases.

Applied Geology was appointed by Newlands Developments to undertake a Desk Study/Phase 1 Geo-environmental Risk Assessment and a Phase 1 Coal Mining Risk Assessment (CMRA) to:

- Permit formulation of an opinion, as to the potential for hazardous substances or conditions to exist on, at or near the site at levels or in a situation likely to warrant mitigation or consideration appropriate to the intended end use proposed by the Client and as stated above.

- Establish anticipated geological conditions to assist with the design of a geotechnical ground investigation for the Phase 1 works.

- Assess potential coal mining related risks.

- Support a Planning Application.

More specifically, the services provided are summarised below and detailed in the following Sections.

- A site inspection and walkover survey to identify indicators (as defined in later sections) of the existence of hazardous substances or conditions on and in the vicinity of the site.

- A review of the following sources to provide data on likely ground conditions, geohazards and features which may affect development and to obtain information about the potential for hazardous substances to exist at and in the vicinity of the site:
  - Groundsure Report - obtained on the 4th August 2020
  - Barnsley Metropolitan Borough Council - Planning Portal
  - BGS - Published Information & Borehole Database
  - Historical Maps
  - Government Web Site - historic landfill database
  - Coal Authority Web Site and liaison with the Coal Authority
  - Coal Mining Report and Abandonment Plans
  - MAGIC Web Site
  - Archaeological Desk-based Assessment by Oxford Archaeology (ref.2019-20/2051)

- Assessment and reporting of the results of the works.

This report should be read in conjunction with the General Notes at the end of the report text.

2.0 SITE LOCATION AND DESCRIPTION

2.1 General

The site is located between Sheffield Road (A6135) to the southwest and Stead Lane to the northeast. It is adjacent to the southeast of the village of Hoyland Common and approximately 6.5km south of Barnsley town centre in South Yorkshire. The Ordnance Survey grid reference for the centre of the site is 436069, 399771 as shown on the Site Location Plan (AG3080D-20-01) included in Appendix A.

The site is irregular in plan shape, covering an approximate area of 5.5ha. The site has a generally undulating topography, with an overall downhill slope towards the southeast from approximately 137m AOD in the north-western corner of the site to approximately 124m AOD on the south-eastern corner of the site.

2.2 Walkover Survey

A site inspection/walkover was undertaken by Applied Geology on the 6th August 2020. Access to the site was gained via a gate off Stead Lane in the north of the site. At the time of inspection, the site comprised two fields separated by concrete fence posts, with the majority of the former mesh fencing no longer visible. The field in the northwest comprised open pasture land and the field in the southeast comprised agricultural land (cropped) and an electricity pylon. Anecdotal evidence from local residents identified that the northwestern field was formerly used as playing fields, but due to the undulating ground surface, was no longer useable for this purpose. A public footpath ran along the northern site boundary and was signposted from the NE corner of the site.

There was no visual or olfactory evidence of any source of gross contamination.

The site was bound to the northeast by Stead Lane, with residential properties beyond and a stream and fields beyond at its eastern extent, to the southeast by the remainder of the cropped field present on site, to the southwest by Sheffield Road and to the northwest by residential properties off Parkside Road beyond. Trees were spread out along all the site boundaries and along the fence line separating the two fields.

	
View of field in northwest, looking east	View of cropped field in southeast, looking northeast

It should be noted that Applied Geology Limited does not provide arboricultural surveys or specialist surveys for the detection of invasive plant species (such as Japanese Knotweed) or protected species of wildlife.

2.3 Proposed Development

The proposals comprise the construction of football pitches and an archery pitch, temporary car parking and a temporary container for changing facilities, refreshments etc. There will be up to 2.9m of cut and up to 3.6m of fill required to create the proposed levels for the various pitches. The development will be carried out in two phases (Phase 1 and Phase 2). Details of the proposed layout, the proposed levels and the earthworks required are shown on various drawings included in Appendix A.

3.0 DESK STUDY INFORMATION

3.1 Site History

Historical Ordnance Survey maps were obtained in order to determine any significant past activity or land usage. Copies of these maps are presented in Appendix B of this report and are described below in Table 1.

Table 1: Site History

Map Date	On the Site	In the Vicinity of the Site
1850-1855	The site comprises several fields, with a possible small structure in the corner of one field in the north of the site.	The surrounding area comprises predominantly agricultural land. Stead Lane is adjacent to the northeast, with Stead Wood beyond. A road (currently Sheffield Road) is adjacent to the southwest. There are numerous ironstone pits southwest of the site, part of Swallow Wood Mine, with the closest being approximately 55m from the site.
1893-1894	No significant changes.	A small pond and stream are beyond Stead Lane east of the site. Another stream is 100m southwest of the site. The ironstone pits closest to the site are marked as disused. The village of Hoyland Common is northwest of the site, with residential properties 160m from the site at their closest. Lidgett Colliery is approximately 750m southeast of the site and Skier's Spring Brick Works is approximately 800m southeast.
1901-1906	A pond is just south of centre on site.	Allotment gardens are adjacent to the northwest. A shaft is marked 475m southeast.
1929-1931	No significant changes.	Stead Wood is now a field and the stream formerly marked east of the site is now shown to run parallel to the northeastern site boundary, beyond Stead Lane. The brick works is now Milton Pottery, with Staindrop Pit (coal) adjacent to the west. Skier's Spring coal pit is approximately 750m east of the site.
1938	No significant changes.	No significant changes.
1948	No significant changes.	No significant changes.
1951-1956	Some of the field boundaries are no longer shown and the pond is not marked.	The stream northeast of the site is shown to flow to the southeast. The old ironstone pits are no longer marked. Opencast mining is labelled southeast of the site, but no outline of the opencast pit is shown.
1966	Overhead electricity cables cross the south of the site, orientated	A refuse tip is now marked at the location of Staindrop Pit. Skier's Spring coal pit is no longer

Map Date	On the Site	In the Vicinity of the Site
	east-west, with a pylon in the southeast of the site.	marked.
1967-1978	No significant changes.	Residential development of Hoyland Common has extended up to the northwestern site boundary, including an electricity substation 125m northwest.
1980	No significant changes.	The refuse tip is labelled as no longer in use.
1987-1993	The site comprises the two fields in their present-day configuration, with the northwestern field marked as a recreational ground.	Residential development has extended adjacent to the northeast of the site, halfway along the northeastern site boundary. All coal and air shafts associated with the former Lidgett Colliery and Staindrop pit are marked as disused. The refuse tip extended to the southwest since 1980 but is now labelled as disused.
2001-2003	No significant changes.	Residential development has extended further along the northeastern site boundary.
2010	No significant changes.	No significant changes.
2020	The recreational ground is no longer marked. The OS Map in the Groundsure Report shows a footpath to run along part of the northeastern site boundary.	No significant changes.

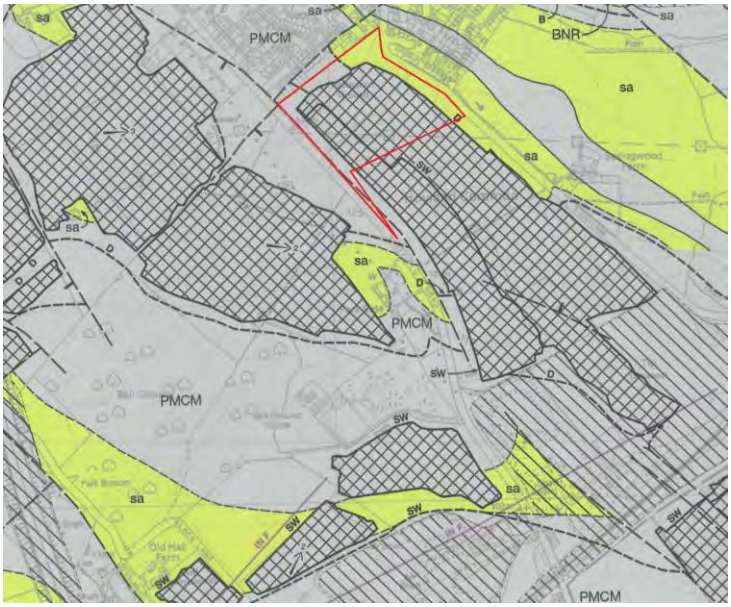
Summary: the historical Ordnance Survey maps show the site to have comprised fields since at least 1850, with opencast mining marked southeast of the site during the mid-20th century. Information in later sections of this report confirm that the opencast mining extended onto site, though this is not apparent from available mapping. The opencast pits have since been backfilled and the land restored back to fields. Further details regarding mining on site are given in Section 7.0 of this report. The surrounding area has remained predominantly agricultural, with numerous former ironstone pits southwest of the site and coal mining and brick works some distance east and southeast of the site. Residential development of Hoyland Common has extended up to the northeastern and northwestern site boundaries.

3.2 Anticipated Geology

Reference to the published 1:50,000 scale British Geological Survey (BGS) map, Sheet 87 (Barnsley) [Bedrock and Superficial Geology] dated 2008 indicates the site to be underlain by Solid Geology of the Pennine Middle Coal Measures Formation of Carboniferous age. A band of sandstone is present along the northeastern site boundary and in the northern corner of the site, with the remainder of the site comprising interbedded mudstone, siltstone and sandstone with numerous workable coal, ironstone and fireclay seams, which have been historically worked in the area. No natural Superficial Deposits are shown to be present on or in the vicinity of the site. A geological fault runs along the southwestern site boundary, downthrown to the southwest.

The Groundsure Report and geological map identify that infilled ground is present across most of the site, excluding strips of land along the northeastern, southwestern and northwestern site boundaries, with infilled ground extending beyond the site to the southeast. This is considered backfill to the former opencast pit, referenced in the Groundsure Report, and labelled southeast of the site on the 1951-1956 OS map.

The 1:10,000 BGS map (extract below) appears to show the Dunsil (also known as Harley) Coal seam to outcrop alongside the sandstone in the north and northeast of the site, with infilled ground across the rest of the site to the south and southwest. It is anticipated that this represents the location of the seam in the opencast highwall at this location and not the pre-opencast outcrop of the seam, which would be further to the southwest. The Dunsil Coal seam is also shown to outcrop to the southwest of the site, and again is likely to represent the location of the seam at the north-eastern extent of that opencast pit. The Swallow Wood Seam is shown running through the site (generally northwest to southeast) within the area of opencast. The seam outcrop is stepped and is believed to relate to the position of the worked seam within the opencast pit. This suggests the Swallow Wood continues beneath the base of the opencast towards the northeast.



The Coal Authority Consultants Coal Mining Report (ref. 51002292341001, dated 04/08/20) states that the Swallow Wood Coal seam, beneath the Dunsil Coal, dips to the east by 2.7 degrees. Seams of coal and ironstone beneath the Swallow Wood Coal dip by around 3 to 4 degrees to the northeast. Copies of the Groundsure Report and the Coal Mining Report are included in Appendix B.

The extraction thickness of the Swallow Wood Coal seam at the site is identified in the Coal Mining Report as being 1.06m thick. The Geological Memoir 'Geology of the Country around Barnsley' dated 1947 states that the Swallow Wood Coal seam is the same as the Netherton Thick Coal seam and the Top Haigh Moor Coal seam encountered elsewhere around Barnsley.

The general sequence of coal seams anticipated on site, based on the BGS 1:10,000 scale map, BGS Memoir, Coal Authority Report, abandonment plans NE419, Sheets 1-5 (discussed in Section 3.3) and previous ground investigation southwest of Sheffield Road by Applied Geology is detailed in Table 2 below. The Coal Authority Report identifies a further six worked coal and ironstone seams beneath the site between 137m and 355m bgl.

Table 2: Summary of Workable Seams up to 100m bgl Beneath Site

Seam	Opencast/ Underground	Colliery	Approx. Depth (m bgl)*1	Date Last Worked	Comments
Unidentified coal	Opencast	Stead Lane	10.9*2	1951	0.29m thick
Dunsil (Harley) Coal	Opencast	Stead Lane	18.9*2	1951	0.71m thick
Thin coal	Opencast	Stead Lane	17.2*2	1951	0.27m thick
Swallow Wood Coal	Opencast in W	Stead Lane	26*2	1951	0.69m thick
	Underground in E	Skiers Spring/Rockingham Colliery	38*3	1956	1.06m thickness extracted
Lidgett Coal	Underground	Lidgett	91*3	1892	0.7m thickness extracted
	Underground	Un-named	94*3	1906	0.75m thickness extracted

Notes: 1. Depths will vary due to site topography and dip of strata
2. Based on abandonment plan NE419, Sheet 1&2, depth to base of excavation on site (maximum depth)
3. Based on Coal Authority Report, depth is to top of coal seam

The BGS online archive was checked for records of any relevant archived boreholes within the vicinity of the site. Several records are shown on the opposite side of Sheffield Road southwest of the site, but are all confidential.

Applied Geology has carried out a ground investigation on the opposite side of Sheffield Road for the proposed Hoyland West development, which included areas both within and outside former opencast areas. The closest exploratory holes were approximately 30m southwest of the site and encountered Topsoil or possible Made Ground to depths of between 0.4m and 0.45m bgl, underlain by weathered Pennine Middle Coal Measures Formation (firm to very stiff silty clay/clay) to depths of between 1.0m and 3.2m bgl. These were located outside the former opencast area to the west of Sheffield Road.

Within the wider Hoyland West area, the Applied Geology ground investigation proved the sequence of Coal Measures strata including various coal seams which match those shown as being extracted from the subject site east of Sheffield Road. The Unidentified Coal, Harley Seam and Swallow Wood seam were all open cast mined to some extent west of Sheffield Road. The 'Thin Seam' opencast mined east of Sheffield Road was generally encountered in the Hoyland West area as a persistent intact seam but, based on the abandonment plans, was not shown to have been extracted.

3.3 Mining History/Geological Cavities

The Groundsure Report identifies historic opencast mining on site and numerous historic underground workings within 1km of the site, predominantly for ironstone and coal. The closest were ironstone pits, reportedly 45m southwest of the site. A Coal Mining Risk Assessment is presented in Section 7.0 of this report, although brief information is presented below.

The site is within a Coal Mining Reporting Area, with much of the site (the area of the former opencast) within a Development High Risk Area.

The Coal Mining Report identifies underground mining of coal seams (Swallow Wood Coal and those below) and the Tankersley Ironstone seam between 1892 and 1956. No shafts are identified on site, with the closest being approximately 70m southwest of the southern extent of the site (ref. 436399-018 & 044).

Abandonment plan ref. NE419, Sheets 1-5, show four opencast pits on site, with an unidentified coal seam initially extracted in the northeast and southeast of the site (maximum pit depth of 10.87m bgl), followed by the Dunsil (Harley) Coal across most of the site (maximum pit depth of 18.95m bgl), followed by a thin coal seam in the west and southwest (maximum pit depth of 17.25m bgl) and the Swallow Wood Coal also in the west and southwest (maximum pit depth of 26m bgl).

The Groundsure Report identifies that the site is not located in an area of recorded natural cavity formation, nor is it within area of known brine or gypsum extraction.

3.4 Natural Ground Stability Hazards

The Groundsure Report has classified the risk of various natural ground stability hazards, depending on the anticipated ground conditions on site. These tend to have a range of risk, given that part of the site is underlain by backfilled opencast pits and some by natural ground.

The risk of ground dissolution of soluble rocks is negligible, of shrink-swell of clays and running sand is negligible to very low, of collapsible deposits and landslides is very low and of compressible deposits is negligible to moderate.

3.5 Radon

The Groundsure Report, which sources information on radon affected areas from the BGS/Public Health England, identifies the western part of the site to be in an area where <1% of properties are above the Action Level and the remainder of the site to be within an area where between 1% and 3% of properties are above the Action Level. Therefore, no precautions against ingress of radon into buildings would be necessary if any new buildings were constructed on site in the future.

3.6 Hydrology

The closest watercourse to the site is a stream, identified on the Groundsure Report approximately 7m northeast, on the opposite side of Stead Lane, and noted during the walkover survey east of the site. The stream flows to the southeast. The Surface Water Flooding map within the Groundsure Report suggests that the stream flows across the northern corner of the site, is culverted along part of Stead Lane and then becomes a surface water course again close to the eastern extremity of the site. The historic maps do not show the stream to formerly or currently cross the site.

There are no surface water abstractions or licensed discharge consents to Controlled Waters within 500m of the site.

The site is not within Fluvial Flood Zones 2 or 3. However, surface water flooding associated with the stream crossing the northern corner of the site has a highest flood risk rating of 1 in 30 years.

The opencast mine abandonment plan shows a deep mine drain at the base of the opencast site which flows to the southeast and discharged into a water course.

This report is not intended to be a full hydrological study and if a flood risk assessment is needed, additional analysis by others is recommended to confirm this aspect of the development.

3.7 Hydrogeology

The Pennine Middle Coal Measures Formation is classified by the Environment Agency as a Secondary A Aquifer.

There are no groundwater abstraction licences within 1km of the site and the site is not located within a groundwater Source Protection Zone.

3.8 Environmental Searches

Information pertaining to environmental issues was obtained from the Groundsure Report. This database contains sets of data corresponding to the databases held by a number of sources including the Environment Agency, British Geological Survey, British Gypsum, The Coal Authority, Public Health England, Johnson Poole & Bloomer and Peter Brett Associates.

The Government website and Groundsure Report indicate that there are no recorded historical landfill or waste sites within 250m of the site, although the Groundsure Report and mine abandonment plans identify former opencast pits on site and geological maps show that most of the site has infilled ground. There are no recorded active landfill sites within 250m of the site.

There is one recorded pollution incident within 250m of the site, which occurred 175m southwest in 2003. This involved unidentified oils, resulting in ‘minor’ impact (Category 3) to land and water.

The Groundsure Report states that there are no current or historic fuel filling stations within 250m of the site.

The Groundsure Report states that neither the site nor any land within 500m is currently designated as Contaminated Land under Part IIA of the Environmental Protection Act.

3.9 Current Industrial Land Uses

There are two relevant current industrial land uses identified by the Groundsure Report within 250m of the site, for electricity substations 75m north and 125m northwest of the site.

3.10 Railways and Tunnels

The Groundsure Report does not have any records of historic or current railways or tunnels within 250m of the site but does identify the High Speed 2 Optimised Route to cross the centre of the site, orientated north-south. However, the current (2020) gov.uk website shows the planned HS2b route several miles to the east of the site.

3.11 Ecology

Information from environmental and ecological datasets was obtained from a review of the MAGIC (Multi-Agency Geographic Information for the Countryside) web site undertaken on the 10th August 2020 and the Groundsure Report.

The site is within a farmland bird breeding area and a priority area for Countryside Stewardship measures addressing lapwing habitat issues. There is a Network Enhancement Zone 1 in the eastern extremity of the site and extending off site to the east and a Network Enhancement Zone 2 approximately 170m southeast of the site. These designations identify land within close proximity to existing habitats, that are more likely to be suitable for habitat recreation (Zone 1) or where other types of habitat may be created or land management enhanced (Zone 2). Adjacent to the south of the site, on the opposite side of Sheffield Road, is the South and West Yorkshire Green Belt.

If a detailed assessment of ecological aspects is required, this should be undertaken by specialist consultants.

3.12 Archaeology

An Archaeological Desk-based Assessment was undertaken for parts of the adjacent Hoyland West proposed development. This identified various structures, features and finds to the west of the site and a late prehistoric/Romano-British enclosure east of the site. As such, it is recommended that an archaeological desk study be carried out for the site prior to any intrusive works, including ground investigation.

3.13 Unexploded Ordnance

The Zetica on-line bomb risk map identifies the site to be within a low risk area of unexploded bombs from WWII.

3.14 Information from the Planning Portal

No pertinent information was available from Barnsley Metropolitan Borough Council's Planning Portal.

4.0 CONCEPTUAL MODEL

In developing a Conceptual Model for the site, pollutant linkages are determined by identifying likely sources of contamination from previous and current site uses, possible targets such as site users, neighbouring site users and Controlled Waters and linkages between them. These are discussed below:

4.1 Summary of Site History

The site comprised fields from at least 1850 until the mid-20th century, when opencast mining occurred across most of the site. The opencast pits appear to have been backfilled in the early to mid-1950s and the land returned to agricultural use. The northwestern field became a recreational ground by the late 1980s/early 1990s, but due to the uneven ground surface, likely due to settlement of the backfill material within the historic opencast pit, is no longer used as such. The surrounding

area has remained predominantly agricultural, with numerous former ironstone pits southwest of the site and former coal mining and brick works some distance east and southeast of the site. Residential development of Hoyland Common has extended up to the northeastern and northwestern site boundaries.

4.2 Summary of Anticipated Geology

The majority of the site is anticipated to be underlain by backfill to the historic opencast pits, up to depths of around 26m bgl and probably comprising overburden (ie. natural deposits), underlain by the Pennine Middle Coal Measures Formation. The opencast pits appear to have extracted four coal seams, with coal and ironstone seams below mined by deep mining.

4.3 Sources

The following specific sources of contamination were identified in the desk study:

- Backfill to the former opencast pits (probably overburden materials) across most of the site and off site to the southeast and colliery spoil, if present, associated with potential unrecorded historic coal/ironstone workings on site;
- Ground gases from backfill material and any spoil on and off site;
- Mine gases on and off site;
- Sulphates in backfill material, any spoil or underlying natural strata on site.

The Applied Geology ground investigation to the west of Sheffield Road did not identify any elevated concentrations of potential contaminants (with respect to human health screening criteria) in the opencast backfill materials tested. There is limited potential for low-mobility PCBs/oils from the electricity substations 75m north and 125m northwest of the site to have impacted the site.

Given the distance and direction from the site and that the pollution incident occurred seventeen years ago, these oils are not considered to represent a plausible source of contamination that could impact the site.

4.4 Receptors

The following receptors have been identified:

- End users;
- Residential neighbours;
- Pennine Middle Coal Measures Formation (Secondary A Aquifer);
- Stream close to northeast/east of site (off site);
- Buried substructure concrete (Building Materials);
- Water supply pipes (Building Materials).

The risk to construction workers is not included here due to the short-term exposure times that they will be subject to and the assumption that good hygiene practices will be adopted on site and the appropriate use of relevant PPE/RPE will be adhered to when exposed to potentially contaminated soils.

4.5 Pathways

Taking into account the proposed end use as sports pitches, car parking and temporary changing rooms, the following pathways are relevant to this development:

- Ingestion of soil;
- Dermal contact with contaminated soil;
- Inhalation of dust, gas and vapour;
- Gas migration to off-site receptors;
- Leaching and/or migration through permeable horizons;
- Direct contact with soil by services, concrete and infrastructure.

4.6 S-P-R Linkages and Assessed Risks

The Conceptual Model described above is summarised below, together with the source-pathway-receptor linkages and qualitatively assessed levels of risk:

Table 3: Initial Conceptual Site Model

Source	Pathway	Receptor	Risk*
Backfill material to historic opencast pits (on and off site) and possible spoil from any historic unrecorded workings (on site)	Ingestion, dermal contact, inhalation of dust	End users	Low
	Leaching/migration	Neighbours	Low
		Stream	Low
		Aquifer	Low
	Direct contact	Water supply pipes	Low
Ground gas from backfill material to historic opencast pits (on and off site) and possible spoil from any historic unrecorded workings (on site)	Migration into temporary changing room, service ducts, etc and inhalation	End users	Low
	Migration into buildings, service ducts, etc and inhalation	Neighbours	Low
Mine gas from the Pennine Middle Coal Measures strata (on and off site)	Migration into temporary changing room, service ducts, etc and inhalation	End users	Low
	Migration into buildings, service ducts, etc and inhalation	Neighbours	Low
Elevated sulphates in backfill material, any spoil and natural soils (on site)	Direct contact	Buried concrete	Medium-High

*** Definition of Risk Categories**

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

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

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

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

5.0 PRELIMINARY GEOENVIRONMENTAL ASSESSMENT

Based on the available information, there is considered to be an overall low risk with regard to Human Health and Controlled Waters receptors.

Although most of the site is anticipated to comprise opencast backfill, there is no evidence that the backfill comprises contaminated materials. Land to the southwest and west of the site has recently been investigated by Applied Geology, with the backfill material encountered as clay, mudstone, sandstone and shale derived from the overburden stripped off to access the coal seams (and possible shallow ironstone). However, such natural materials (assumed not to have been engineered when placed into the void, given the undulating ground surface) may still give rise to high levels of some (naturally occurring) heavy metals, PAHs, sulphates and ground gas.

Based on the anticipated natural backfill materials/spoil, the likelihood of elevated concentrations of ground gas (methane and carbon dioxide) being present to effect on and off-site receptors is considered to be low.

Mine gas (methane, carbon dioxide, carbon monoxide and hydrogen sulphide) could be present from remnant shallow unworked coal seams and/or deeper workings, which could potentially migrate to the surface laterally along old workings.

Although a Secondary A Aquifer, the Coal Measures strata at the site have been subject to shallow and deeper coal mining and it is not anticipated that this will be viewed as a key receptor. It is understood that the site is to be drained and run-off towards the stream adjacent to the northeast/east of the site is therefore not anticipated.

6.0 PRELIMINARY GEOTECHNICAL ASSESSMENT

Given the historical opencast mining on site, the unknown backfill material up to 26m thick, and the uneven surface settlement of this material evident during the walkover survey, there is the potential for ongoing settlement within the former opencast on site, particularly where site levels are being raised and if building loads are to be transmitted to the backfill materials, though it is anticipated that the majority of self-weight settlement will now have occurred. The deep drain placed at the base of the opencast may have helped keep groundwater levels suppressed, which could increase the risk of inundation settlement.

The opencast highwalls coincide with the footprints of all three football pitches, the car park and the overshoot area of the archery zone. This could create issues with differential settlement, especially where site levels are to be increased, even though there are no or minimal construction loads.

The proposed cut slopes along the northern site boundary are anticipated to lie should be just outside the former opencast, hence cut slopes are expected to be formed in natural coal measures strata. Proposed 1v:3h slopes may well be stable here but a ground investigation is needed to confirm the highwall locations. Similarly, the cut slope in the NE corner of the site is also anticipated to be just outside the opencast highwall and so again would be expected to be suitable at 1v:3h, subject to the investigation confirming highwall location and material properties. The proposed cut slope along the western end of the sports pitches

(assumed to also be 1v:3h) will straddle the highwall and be largely in opencast backfill materials and so may not be stable based on the findings of the ground investigation and slope stability analyses undertake on the adjacent Hoyland west site. Consideration will need to be given to re-engineering the slope materials and a shallow thickness of the underlying founding materials.

The coal content and calorific value of the materials to be re-used as engineered fill will need to be investigated, along with the engineering properties and material classification. Possible unworked coal associated with the Unnamed Seam could be encountered at shallow depth in the cut slopes in the north of the site.

The Coal Measures strata are anticipated to be predominantly cohesive, ie. of low permeability, except in the north and along the northeastern site boundary, where sandstone is expected, which will probably have a higher permeability. Possible soakaway drainage from the sports pitches and the temporary car park will need to take this into account and may not be viable.

Elevated concentrations of sulphates, and potentially low (acidic) pH should be anticipated in the opencast backfill materials, but may also be present in the natural Coal Measures strata. Therefore, sulphate-resisting concrete is envisaged to be required for any buried structures.

7.0 PRELIMINARY COAL MINING RISK ASSESSMENT

The site is located within an area designated by the Coal Authority (CA) as being of Development High Risk as a result of historic coal mining legacy. As a result, a Coal Mining Risk Assessment (CMRA) is required to identify the historic coal (and other mineral) mining risks and any mitigation measures required prior to the proposed development of the site for playing fields.

Assessment has been made using 1:10,000 geological maps, The Geological Memoir ‘Geology of the Country around Barnsley’, the CA Interactive Maps and Consultants Coal Mining Report and CA Abandonment Plans.

7.1 Published Geology

7.1.1 Made Ground and Superficial Strata

Although the site has not been subject to any built development, significant thicknesses of disturbed ground are expected beneath the site, associated with historic opencast coal mining of four separate seams.

For the most part, this Made Ground is expected to comprise reworked natural strata (mainly clays, mudstone, siltstones and sandstone) derived from excavation and replacement of overburden after the removal of coal. While this form of mining and restoration is unlikely to result in the creation of residual voids, it will not have been compacted to an engineering specification.

It is expected that the thickness of the Made Ground will not extend much further beneath the base of the Swallow Wood Seam in the west and the Dunsil (Harley) Seam in the east, as indicated by Abandonment Plan NE419 (5 sheets).

No Superficial Deposits are mapped on or in the vicinity of the site.

7.1.2 Solid Strata

Solid strata of the Pennine Middle Coal Measures Formation of Carboniferous age are present on site. These strata generally comprise cyclical sequences of mudstone, siltstone and sandstones within thin coal and ironstone seams. The strata sequence expected to immediately underlie the proposed site at depths likely to influence the proposed development comprise those just above the Dunsil (Harley) Seam to the Swallow Wood Seam. The Dunsil (Harley) Seam is marked as outcropping at the eastern end of the opencast area (having been present across the majority of the site prior to being opencast mined). The Swallow Wood Seam is shown as sub-cropping within the opencast mine, having been mined to the southwest and dipping at shallow angle below the base of the opencast to the northeast.

According to the CA report, the Swallow Wood seam was underground mined (min. 38m depth) via the Skiers Spring Colliery, however, the abandonment plan for that colliery doesn't show any workings beneath the site. However, Abandonment Plan NE820 for the Rockingham Colliery does show that the Swallow Wood seam was mined below the eastern part of the site and the date last mined (1956) matches that noted in the CA Report.

The Lidgett Colliery Abandonment Plan 5843 shows that the Lidgett Seam was also deep mined below most of the site and is anticipated at 91-94m bgl at its shallowest points (where mined).

Abandonment Plan NE419 5 of 5 indicates the following sequence and typical seam thicknesses:

- Unidentified Seam – 0.29m thick;
- Grey bind (separation) – 5.89m;
- Harley (Dunsil) Seam – 0.71m;
- Stone (separation) – 4.77m;
- Thin Seam – 0.27m;
- Stone & grey bind (separation) – 10.21m;
- Swallow Wood Seam – 0.69m.

Abandonment Plan NE820 for the swallow Wood workings beneath the site and surrounding areas to the northeast, east and southwest, indicate that the Sallow Wood seam comprises 4 leaves with the main leaf being 0.91m thick. The typical section also shows that a 0.96m thick ironstone band also overlies the upper leaf.

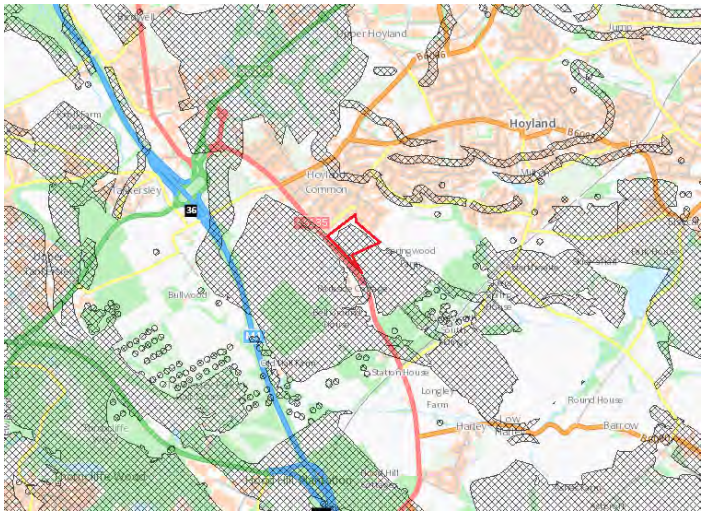
A geological fault is located to the west of the site approximately along the alignment of Sheffield Road, down-throwing to the southwest. A smaller fault is shown on the abandonment plans parallel to this fault and which disrupted the coal seam continuity within the opencast mine. Another fault is shown just to the north of the site, running approximately northeast-southwest and down-throwing to southeast.

7.1.3 Coal Authority Interactive Map and Consultants Coal Mining Report

Consultation of the Coal Authority's Mining Searches Directory indicates that the site lies in an area for which a standard mining report is required for a new

development. A copy of the CA Consultants Coal Mining Report is presented in Appendix B.

Reference to the CA Interactive map shows most of the site falls within a Development High Risk Area (DHRA). This means that the Local Authority is required to refer any planning application to the CA, and the CA will require the preparation of this CMRA to assess the risks posed by historical mining legacy.



Extract from Coal Authority Interactive Mapping showing the Development High Risk Areas

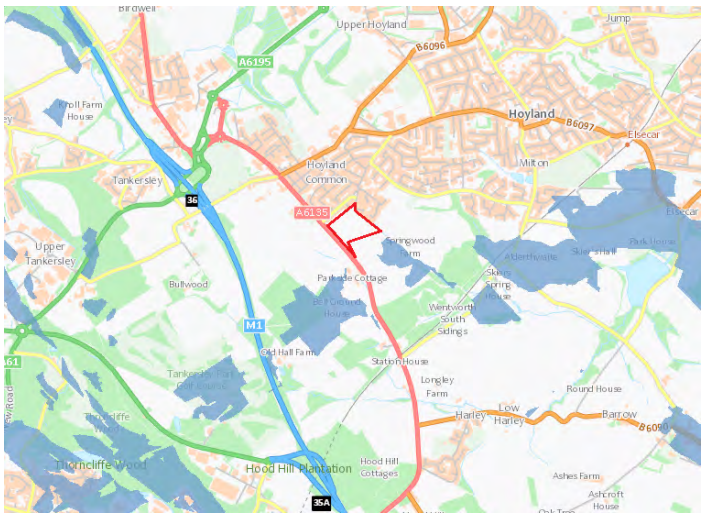
Extract from Coal Authority Interactive Mapping showing Unlicensed Opencast Areas

Closer examination of the DHRA shows that its boundaries relate to the area of opencast mining.

Basic information on underground mining is provided by the attached CA Consultants Report. The extent of local coal mining history is demonstrated by the fact that at least ten separate coal and ironstone seams have been mined by at

least five different collieries. A general summary (covering 100m depth) is present in Table 2 of Section 3.2 of this report.

The CA Interactive mapping shows where historic shallow coal mine workings are known or thought to have existed. At this site, the DHRA shown above relates to 'probable shallow coal mine workings', associated with the presence of the Swallow Wood Coal seam present to the southeast and southwest of the site. However, the CA Interactive mapping indicates that underground shallow coal mine workings of the Swallow Wood did not extend onto the site, as shown below.



Extract from Coal Authority Interactive Mapping showing Past Shallow Coal Mine Workings

It is noted, however, that the Coal Authority Consultants Report states that the Swallow Wood Seam was mined from the Skiers Spring Colliery at 38m bgl beneath the site.

The CA Consultants Coal Mining Report identifies the shallowest ironstone seam to be the Tankersley seam at 137m bgl, which is thought have been last mined in 1879 as part of Tankersley Colliery. From the work undertaken for the Hoyland West site, it is known that shallower ironstone workings, possibly bell pits, are recorded nearby, to the southwest on the opposite side of Sheffield Road.

The CA Consultants Report show the positions of recorded mine entries (shafts or adits) within close proximity of the site but none on the site itself. Both shafts are closer to the Hoyland West development and are discussed in the corresponding CMRA and GIR reports for that site. However, a summary of known information is provided below.

Table 4: Mineshafts and adits

CA Reference	Coordinates	General location	Mineral	Treatment/ Comments
436399-018	436037, 399508	To SW of site	Coal	Has been filled and mounded to an unknown specification
436399-044	436012, 399543	To SW of site	Coal	No treatment records.

Other data contained within the CA report can be summarised as follows:

- there are no probable unrecorded shallow workings;
- there are no managed tips within 500m of the enquiry boundary;
- there have been no remediation works recorded within 50m of the enquiry boundary;
- the CA is not aware of any request having been made to carry out preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991;
- there have been no reports of mine gas incidents within 500m of the enquiry boundary;
- there have been no claims regarding coal mining subsidence within 50m of the property boundary;
- there are no mine water treatment schemes in the vicinity of the site;
- there are no licences for current coal mining or future underground coal mining within 200m of the site.

7.1.4 Coal Mine Abandonment Plans

The Coal Authority archives were searched and copies of eight mine abandonment plans were obtained (others were available but were for seams worked at significant depths below the site). A summary of the pertinent information contained on the plans is provided below and copies are included in Appendix B.

Table 5: Abandonment Plans

CA Ref:	Title	Date	Relevant Information
NE419 1 of 5	Stead Lane (Opencast)	1960	Individually shows depth of extraction of four coal seams including Harley (Dunsil) and Swallow Wood
NE419 2 of 5	Stead Lane (Opencast)	1960	Composite drawing of above four worked seams including dates of workings and restoration and typical vertical section
NE419 3 of 5	Stead Lane (Opencast)		Detailed plan of Unidentified Seam and Thin Seam workings including typical sections
NE419 4 of 5	Stead Lane (Opencast)		Detailed plan of Harley (Dunsil) Seam workings including typical section
NE419 5 of 5	Stead Lane (Opencast)		Detailed plan of Swallow Wood Seam workings including typical section
M796	Skiers Spring		Swallow Wood but doesn't cover the site area
NE820	Rockingham Colliery		Swallow Wood seam underground workings below eastern part of site (also shows Stead Lane opencast extent in the same seam)
5843 Part A*	Lidgett, Plan of Abandonment	Not shown	Lidgett Coal seam worked beneath the majority of the site but not toward Sheffield Road

7.2 Summary of Coal Mining Issues

Based on available data, the table below summarises the potential risks associated with the mining legacy for the proposed development site.

Table 6: Coal Mining Issues Summary

Coal Mining Issue	Yes/No	Risk Assessment
Recorded underground shallow mine workings	Yes	Low risk – mined at 38m or greater depths in 1955/56. Movements should by now have ceased.

Coal Mining Issue	Yes/No	Risk Assessment
Unrecorded underground shallow mine workings	Yes	Low risk: workable shallow seams all recorded as mined but adjacent unrecorded workings could exist
Recorded Mine entries (shafts and adits)	No	Negligible
Unrecorded Mine entries (shafts and adits)	Yes	Very low risk – potentially present just outside opencast area where seams shallowest.
Mining geology (faults and fissures)	Yes	Very low risk – faulting recorded on abandonment plan within opencast mine now backfilled
Record of past mine gas emissions	No	Negligible
Recorded mining surface hazard	No	Negligible
Surface mining (opencast workings)	Yes	Low Risk: Uncontrolled backfill

7.2.1 Recorded Underground Shallow Mine Workings

Shallow underground mine workings of the Swallow Wood Coal seam are recorded on mine abandonment plan NE820 which shows underground workings from 1955 and 1956 below the eastern part of the site. The CA Report states the shallowest depth of workings being 38m bgl. There is estimated to be between 15 and 20m of solid strata between the underground workings of the Swallow Wood seam and base of opencast mine above. Given this and the nature of the proposed development, these underground workings are unlikely to affect the construction.

Underground mine workings of the Lidgett Coal seam are shown on mine abandonment plan 5843 Part A beneath most parts of the site. However, the depth of working is thought to be more than 90m beneath the site. It is considered that there is sufficient thickness of solid strata between the workings and the ground surface to mitigate against the risk of void migration and any general aerial settlement as a result of former workings should now be complete. No further mitigation is required. Recorded workings in coal and ironstone seams below the Lidgett are therefore also considered to present a negligible risk to surface instability.

7.2.2 Unrecorded Underground Shallow Mine Workings

Given the date, depth and extent of the opencast mine in this area, there are not anticipated to be any unrecorded underground shallow coal mine working present at the site. However, the Dunsil (Harley) Seam is shown to outcrop in the north-western corner of the site just outside the opencast boundary and therefore potential old shallow workings (probably via bell pits) could theoretically exist here. A few trial pits could be undertaken in this area as part of the ground investigation works, followed by watching brief during the earthworks exercise during site preparation works.

7.2.3 Unrecorded Mine Entries

The proposed development site's coal mining context is such that there will always be a low risk of unrecorded mine entries being present. The same comments and recommendations made in section 7.2.2 above also relate to the risk of unrecorded mine entries. Any anomalous features that may indicate historic mine entries should be investigated and recorded by a competent person.

7.2.4 Mining Geology (faults & fissures)

Minor faulting was noted in the opencast mine (also shown on the underground mine plan) and another fault is mapped immediately west of the site, however, these are not considered likely to affect the proposed development.

7.2.5 Surface Mining (Opencast Workings)

The proposed development area has been subject to historic opencast mining to various depths across the majority of the site. Variations in backfilling compaction can result in variable and unpredictable settlement when new loads are applied and also as a result of self-weight settlement and changes in groundwater levels. This is particularly the case at highwalls, where sudden variations in thickness of Made Ground can occur. Even so, the plans for this site are not particularly sensitive to differential settlements and so the risk is deemed to be low. Highwall locations should be investigated where they coincide with the proposed development, especially in areas of fill which will add loads to the ground and induce settlement in the loosely compacted opencast backfill material.

7.3 Conclusions

This CMRA has revealed significant mining heritage at the proposed development site, which has included opencast mining of four coal seams and underground mining of coal and ironstone. However, given the low sensitivity of the proposed development (football pitches and archery zone) the risks of mining issues affecting the development are considered to be low to very low.

8.0 RECOMMENDATIONS

A ground investigation is recommended to confirm the anticipated ground conditions, validate the conceptual site model, locate the highwalls associated with the former opencast pits on site, check the Coal Measures strata outside the opencast boundary and assess the suitability of materials for re-use in the proposed earthworks. Note that this investigation will only address the requirements of Phase 1 of the proposed development, however, geotechnical information useful to the design of the Phase 2 works (by others) will be obtained.

A series of trial pits are envisaged to investigate the nature and lateral extent of the opencast backfill materials and obtain representative samples for earthworks classification testing and chemical testing. Some trial pits may be extended as trenches to identify the highwalls across the site and some pits will be positioned to check for shallow coal seams just outside the opencast boundary in the northwest of the site. Some shallow driven continuous sample boreholes are also recommended to obtain some in situ (SPT) test results and to allow the installations of standpipes to check for any shallow groundwater. A series of Cone Penetration Tests (CPT) are also recommended to get further in situ parameters for the opencast backfill materials and to check for possible deeper groundwater. However, the CPTs are not intended to prove the base of the opencast backfill materials.

If, as expected, the backfill materials comprise inert natural materials derived from the overburden, large numbers of chemical tests are not considered necessary. However, as there could be elevated concentrations of naturally occurring sulphates and possibly arsenic in the opencast backfill and in-situ Coal Measures strata,

sufficient testing should be undertaken to appropriately classify the materials. Testing should comprise a general suite of contaminants and a few selected samples from the southern part of the site should be tested for pesticides.

Geotechnical laboratory testing is envisaged to comprise soil and rock classification testing, earthworks suitability testing, remoulded shear strength testing and BRE SD1 sulphate testing.

Groundwater monitoring should be undertaken to help establish groundwater levels. If appropriate, groundwater samples could be obtained and tested for sulphate levels and a range of commonly occurring contaminants.

This desk study/Phase I Geo-environmental Risk Assessment and Phase I Coal Mining Risk Assessment Coal should be submitted with the Planning Application to demonstrate that the site has been adequately investigated at the pre-planning stage and that sufficient information has been obtained to design an appropriate Phase II intrusive investigation. On completion of the intrusive investigation, a Ground Investigation Report (GIR) should be produced.

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Tel: 02476 511822

GENERAL NOTES

A) The assessment made in this report is based on the site terrain and ground conditions revealed by the various field investigations undertaken and also any other relevant data for the site including previous site investigation reports (if available) and desk study data. There may be special conditions appertaining to the site, however, which have not been revealed by the investigation and which have not, therefore, been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available. It must be recognised that many of the Environmental Searches obtained during the course of the desk study are often lengthy. Applied Geology have, where appropriate and in the interests of simplicity, only reproduced the summary of the searches within the report. A full copy of all the search data is held at the Applied Geology office and is available for inspection if required.

B) Where any data supplied by the Client or other external source, including that from previous site investigations, has been used it has been assumed that the information is correct. No responsibility can be accepted by Applied Geology for inaccuracies within this data.

C) Whilst the report may express an opinion on possible configurations of strata between or beyond the exploratory locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy.

D) Comments on groundwater (and landfill gas) conditions are based on observations made during the course of the present and past investigations or with reference to published data unless otherwise stated. It should be noted, however, that groundwater (and landfill gas) levels vary due to seasonal (or atmospheric conditions) or other effects.

E) The copyright of this report and other plans and documents prepared by Applied Geology is owned by Applied Geology and no such report, plan or document may be reproduced, published or adapted without the written consent of Applied Geology. Complete copies of the report may, however, be made and distributed by the Client as an expedient in dealing with matters related to its submission.

F) This report is prepared and written in the context of the proposals stated in the introduction to the report and should not be used in a differing context. Furthermore, new information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Applied Geology for re-assessment and if necessary, re-appraisal.

G) The survey was conducted and this report was prepared for the sole internal use and reliance of the Client. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Applied Geology. If an unauthorised third party comes into possession of this report they rely on it at their peril and Applied Geology owes them no duty of care and skill.

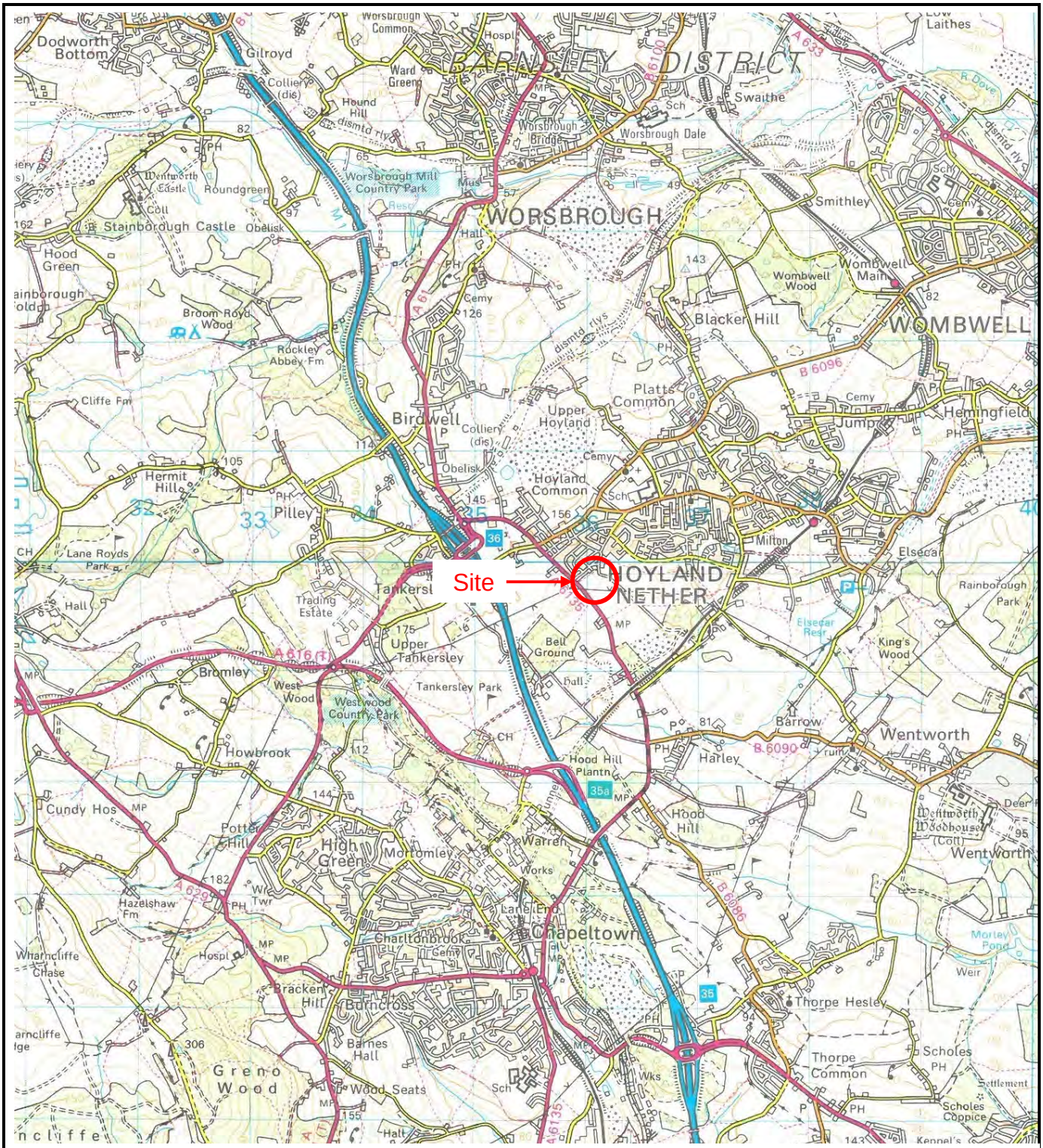
H) Ground conditions should be monitored during the construction of the works and the recommendations of the report re-evaluated in the light of this data by the supervising geotechnical or geo-environmental engineers.

I) Unless specifically stated, the investigation has not taken into account the possible effects of mineral extraction.

J) The economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, depends on very many factors in addition to geotechnical considerations and hence its evaluation is outside the scope of this report.

K) Applied Geology operates as a Consultancy and does not operate it's own laboratory for soil testing, this work being sub contracted to known and respected, generally UKAS accredited, laboratories. Applied Geology can therefore not be held responsible for the testing carried out.

APPENDIX A



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APPLiED GEOLOGY

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Tel: 02476 511822
email: admin@appliedgeology.co.uk

Client: newlands developments

Project: PARKSIDE, HOYLAND

Drawn By:	Checked By:	Paper Size:
FD	SD	A4

Scale:	Date:	NGR:
NTS	10.08.2020	436069 99771

Title: SITE LOCATION PLAN

Drawing No:	Revision:
AG3080D-20-01	0

2.4m high Paladin (weldmesh) Fencing
Dark Green RAL.6005, to boundary

Notes;

To enable the archery club to have a continuous use it is proposed to undertake the works as indicated in two phases.

Phase 1 will comprise;

- Undertake site clearance to form new entrance off Sheffield Road;
- Provide a temporary surfaced access way and car park area;
- Undertake earthworks and re-modelling to create plateaus for new archery zone area and sports pitches.
- Subject to the timing of the land exchange the archery area is proposed to be part turfed (to the archery runs) and part grass seeded to the remainder.
- The provision of new archery zone will be located on the lower plateau.
- Provide container storage.

Phase 2 will comprise;

- Finalise clearance and earthworks re-modelling to create required level plateau for sports pitches
- playing areas to be left with a topsoil surface ready to receive seeding/turf as part of BMBC phase of works;
- Form new permanent entrance off Sheffield Road together with underground electricity and surface and foul water supplies to serve the future community building;

existing public right of way maintained

Phase 2.
finalise levels and topsoil surface pitches

Phase 1.
earthworks plateauing

Phase 2.
form permanent access, electricity, foul and surface drainage supplies, capped off as necessary for future connection

3m wide footpath with weldmesh fence on southern edge

ground slope

61000

43000

17s / Adults

+132.50

106000

70000

Mini Soccer Under 7/8s

79000

52000

Youth Under 9 / 10s

140m length archery division fence

50000

overshoot area

140m

90000

+128.50

5m shooting lanes

15m 5m 5m 5m

30m range

50m range

60m range

70m range

90m range

870m length site boundary fence

existing pylon

boundary line

weldmesh fence

shooting line

Phase 1.
existing drains to remain

Plot redline
area 4.38ha

Phase 1.
temporary surfaced access and parking area

Phase 1.
perimeter fencing

Phase 1.
turf/seeding of archery zone
(pink dotted line area 0.988ha)

Phase 1.
provide container storage and temporary portakabin type changing/toilets

indicative overhead electricity cable zone

136.0m

129.2m

120.6m

1 in 20

1 in 7

1 in 9

1 in 6

1 in 4

1 in 5

1 in 5

A6195 - Sheffield Road

CCS

Revision:

P1	first issue	12aug2020 PL
P2	boundary fence type noted	18aug2020 PL
P3	updated as required	19aug2020 PL

0 25m 50m SCALE 1:1000

N

Hoyland Common
Barnsley M1, J36

newlands developments

pHp Architects
www.peter-haddon.com

Land for Sports Facilities
Proposed Phase 1 and Phase 2 works

Drawing Status:	Preliminary
CAD Reference:	4400-001
Drawn:	PL
Date:	feb2020
Scale @A1:	1/1000

Project No:	Drawing No:	Rev:
4400	SP002	P3

Notes

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2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Key:

+ 130.500 : Proposed Level
1:6 : Proposed Gradient
: Major Contour 0.5m Intervals
: Minor Contour 0.1m Intervals

N

3m wide footpath with weldmesh fence on southern edge

Existing drain to be retained Location and level to be established before commencement of works.

Existing Levels Maintained Along PROW Footpath

17s / Adults

Mini Soccer Under 7/8s

Youth Under 9 / 10s

Detention Basin
Invert = 124.800

existing pylon

87m length 3m high weldmesh Site boundary fence

PARKSIDE ROAD

WARREN VIEW

BLUEF

10m SCALE 1:500

P01	First Issue	ST	AE	20.08.20
Rev	Description	By	Ckd	Date

MAKING COMPLEX EASY

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Client: newlands developments

Project: Hoyland

Title: Sports Facility
Proposed Levels

RPS Project Number	Scale @ A1	Date Created
NK020040	1:500	20.08.2020

Task Team Manager	Information Author	Task Information Manager
SG	ST	AE

Status: S2 (Suitable for Information)

Document Number: HOYLA-RPS-SI-XX-DR-C-1651
Revision: P01

Project Code - Originator - Zone - Level - Type - Role - Drawing Number

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2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Design Assumptions

1. This drawing is based on Greenhatch Survey Z001_30326_T_REV0 Topo
2. The Cut and Fill analysis on this drawing is based on the Proposed Finished Floor Levels indicated on RPS drawing HOYLA-RPS-SI-XX-DR-C-1651.
3. The Cut and Fill analysis is based on a general construction depth of 450mm for car park and access road.
4. No allowance has been made for a site strip.
5. No bulking factors have been applied to the figures below.
6. No allowance has been made for drainage or foundation arisings
7. Cut & Fill volumes:

Total cut	**= 16,799m³**
Total Fill	**= 19,128m³**
Net (Defecit)	**= 2,329m³**

N

3m wide footpath with weldmesh fence on southern edge

Existing drain to be retained Location and level to be established before commencement of works.

PROW Footpath levels to be maintained

17s / Adults

Mini Soccer Under 7/8s

Youth Under 9 / 10s

GRASS FIELD

floodlighting for parking approx 120lux

OHP ht:142.4m

OHP ht:142.6m

OHP ht:146.7m

existing pylon

OHP ht:146.7m

87.0m length 3m high weldmesh and boundary fence

PARKSIDE ROAD

WARREN VIEW

BLUEBE

SHEFFIELD ROAD

STNST01A

STNST02A

SURFACE LEVEL DATA

NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA	VOLUME
1	-2.90	-2.00		1683.243m2	387.498m3
2	-2.00	-1.00		6224.923m2	4785.420m3
3	-1.00	0.00		10700.824m2	11626.179m3
4	0.00	1.00		10509.002m2	12036.188m3
5	1.00	2.00		4474.498m2	5371.412m3
6	2.00	3.00		2771.184m2	1634.635m3
7	3.00	3.60		465.400m2	85.465m3

Cut

Fill

10m

SCALE 1:500

Rev	Description	By	Ckd	Date
P01	First Issue	ST	AE	20.08.20

MAKING COMPLEX EASY

Sherwood House, Sherwood Avenue,
Newark, Nottinghamshire, NG24 1QQ
T:01636 605 700 **E**: rpsnewark@rpsgroup.com

Client: newlands developments

Project: Hoyland

Title: Sports Facility Earthwork Volumes

RPS Project Number	Scale @ A1	Date Created
NK020040	1:500	20.08.2020
Task Team Manager	**Information Author**	**Task Information Manager**
SG	ST	AE

Status: S2 (Suitable for Information)

Document Number: HOYLA-RPS-SI-XX-DR-C-1650

Revision: P01

Project Code - Originator - Zone - Level - Type - Role - Drawing Number

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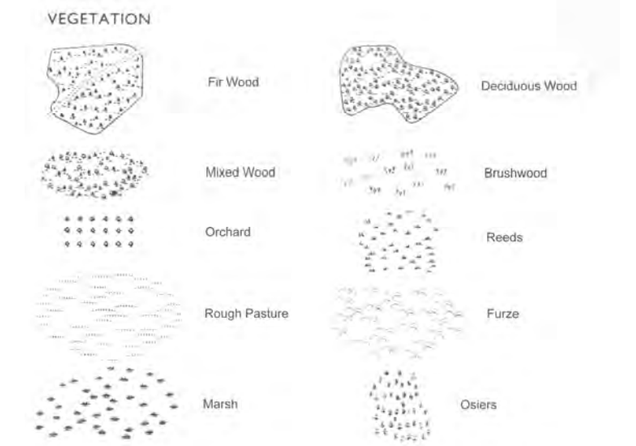
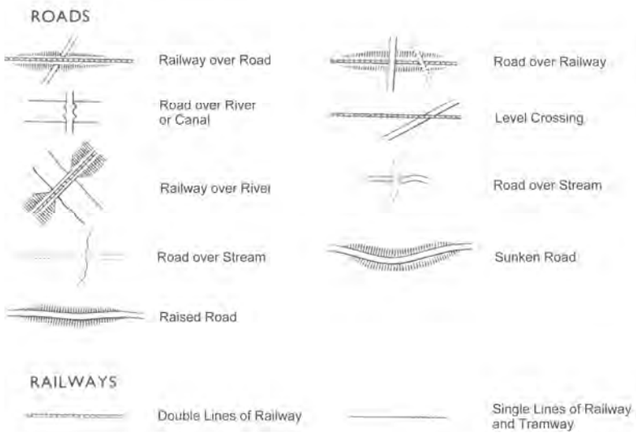
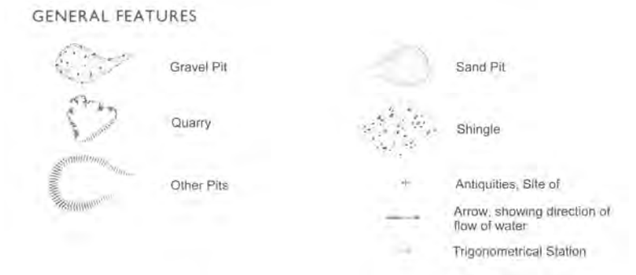
APPENDIX B

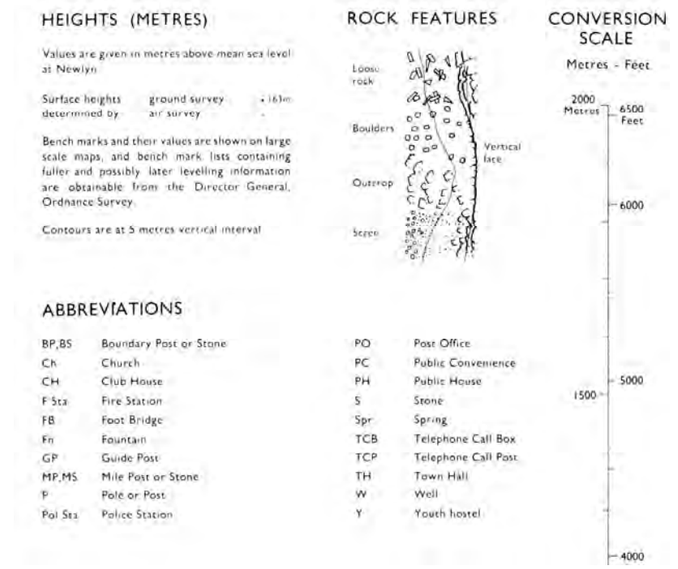
County Series 1:10,560 scale

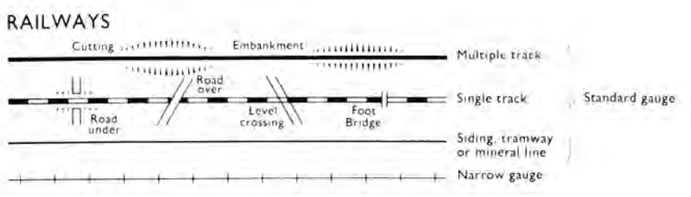


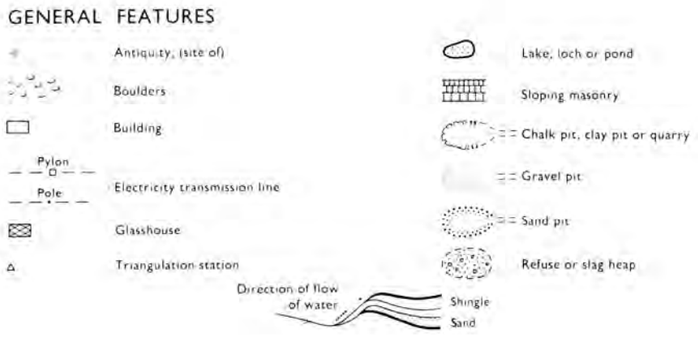


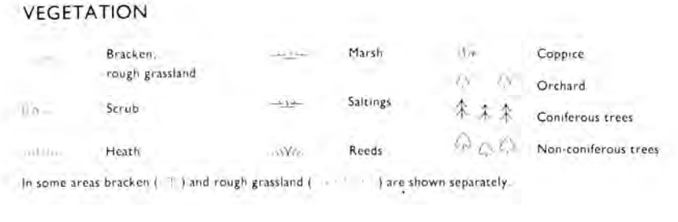


National Grid 1:10,000 scale









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Historical Map Pack Legend

County Series & National Grid

1:10,560 scale

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

If you have a query regarding any of the maps provided please contact GroundSure's technical helpline. We will endeavour to answer any queries you may have.

Technical Helpline

Tel 08444159000

groundsureinsight@groundsure.com
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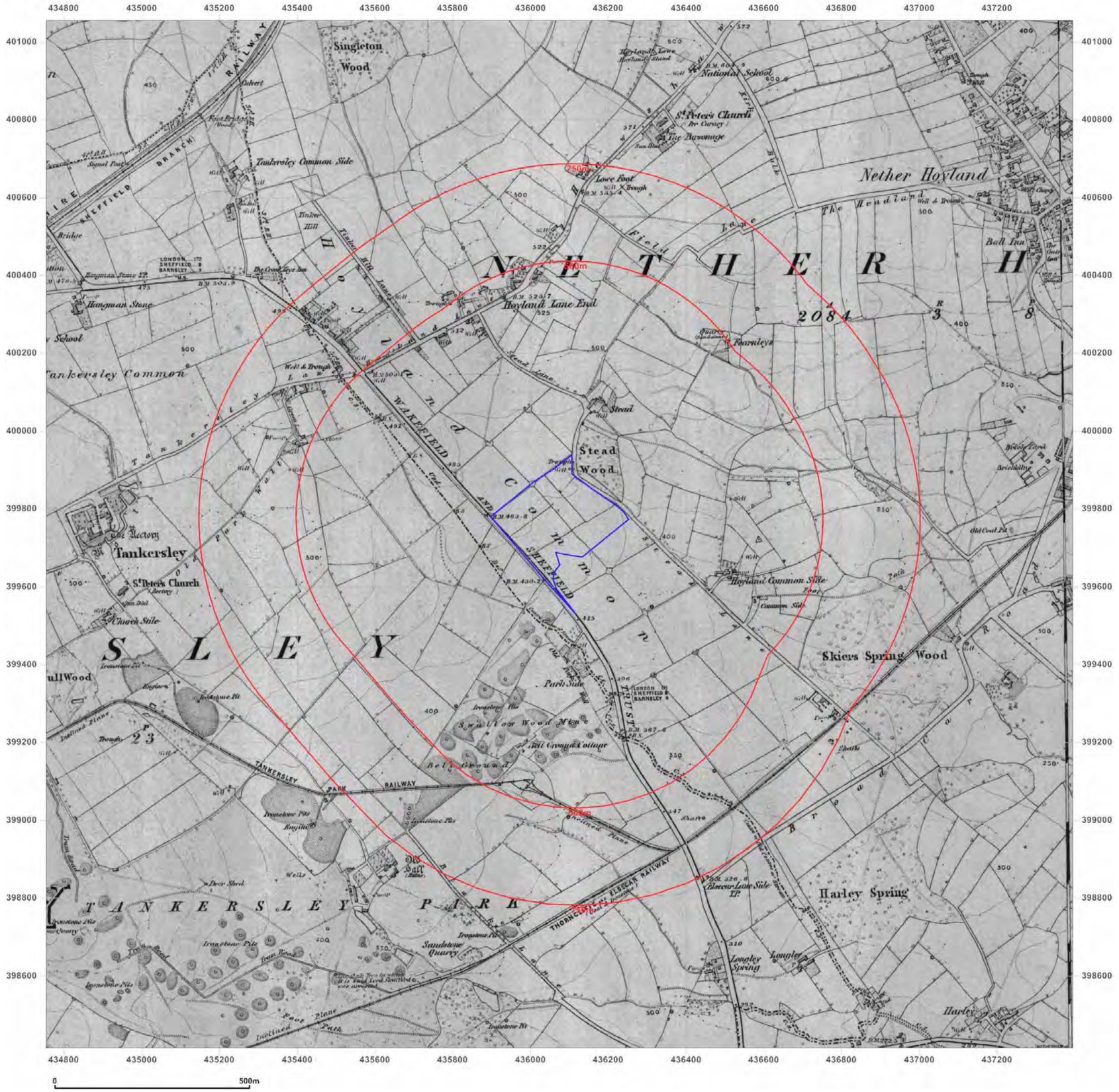

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Site Details:

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Client Ref: EMS_625397_832707
Report Ref: EMS-625397_832707
Grid Ref: 436074, 399734

Map Name: County Series

Map date: **1850-1855**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1851
Revised N/A
Edition 1855
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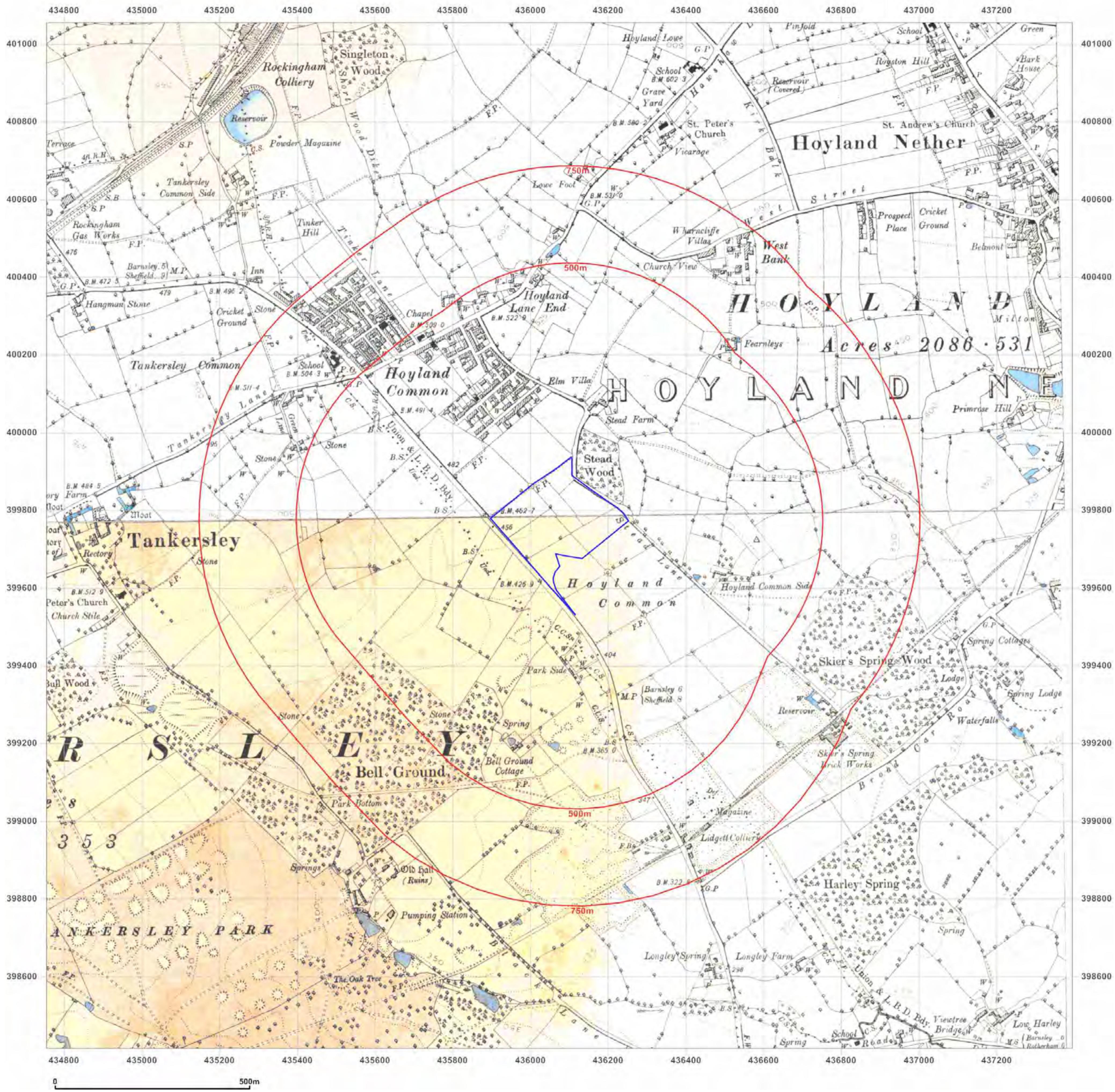

Site Details:

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Road, Hoyland,S74 0AH

Client Ref: EMS_625397_832707
Report Ref: EMS-625397_832707
Grid Ref: 436074, 399734

Map Name: County Series

Map date: **1891-1894**

Scale: 1:10,560

Printed at: 1:10,560

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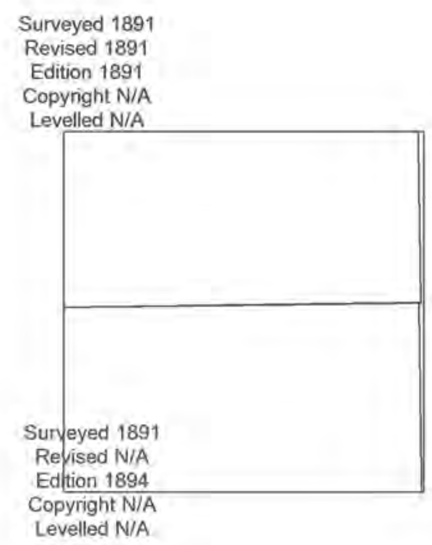

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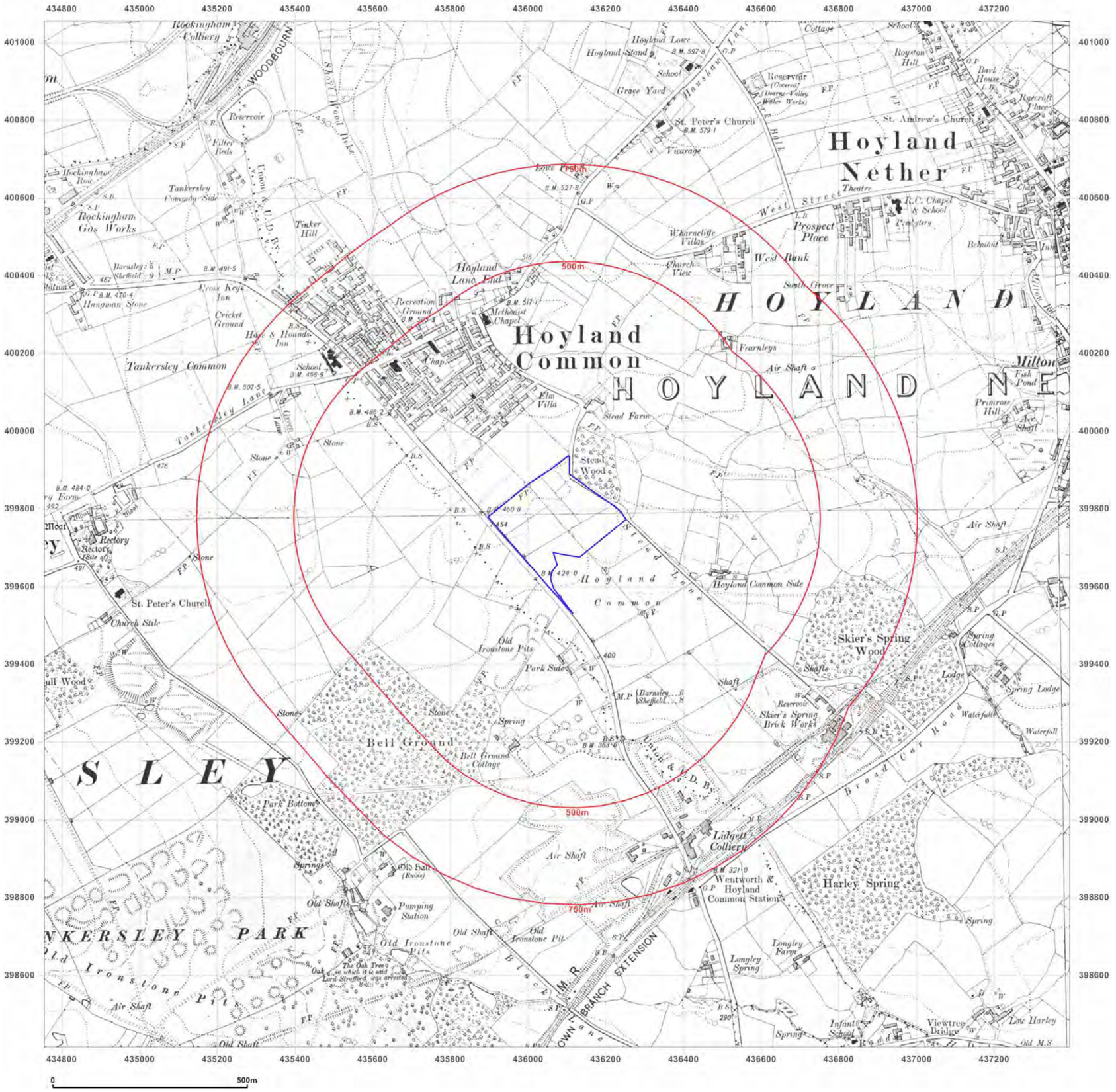

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Client Ref: EMS_625397_832707
Report Ref: EMS-625397_832707
Grid Ref: 436074, 399734

Map Name: County Series

Map date: **1901-1903**

Scale: 1:10,560

Printed at: 1:10,560

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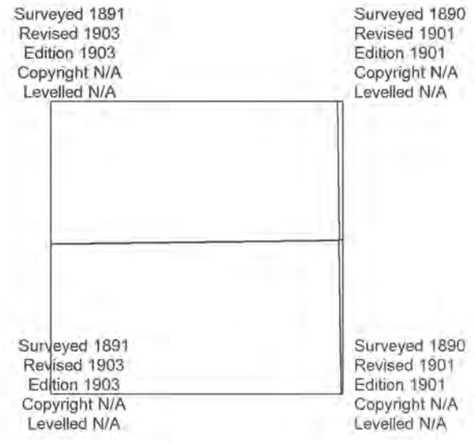

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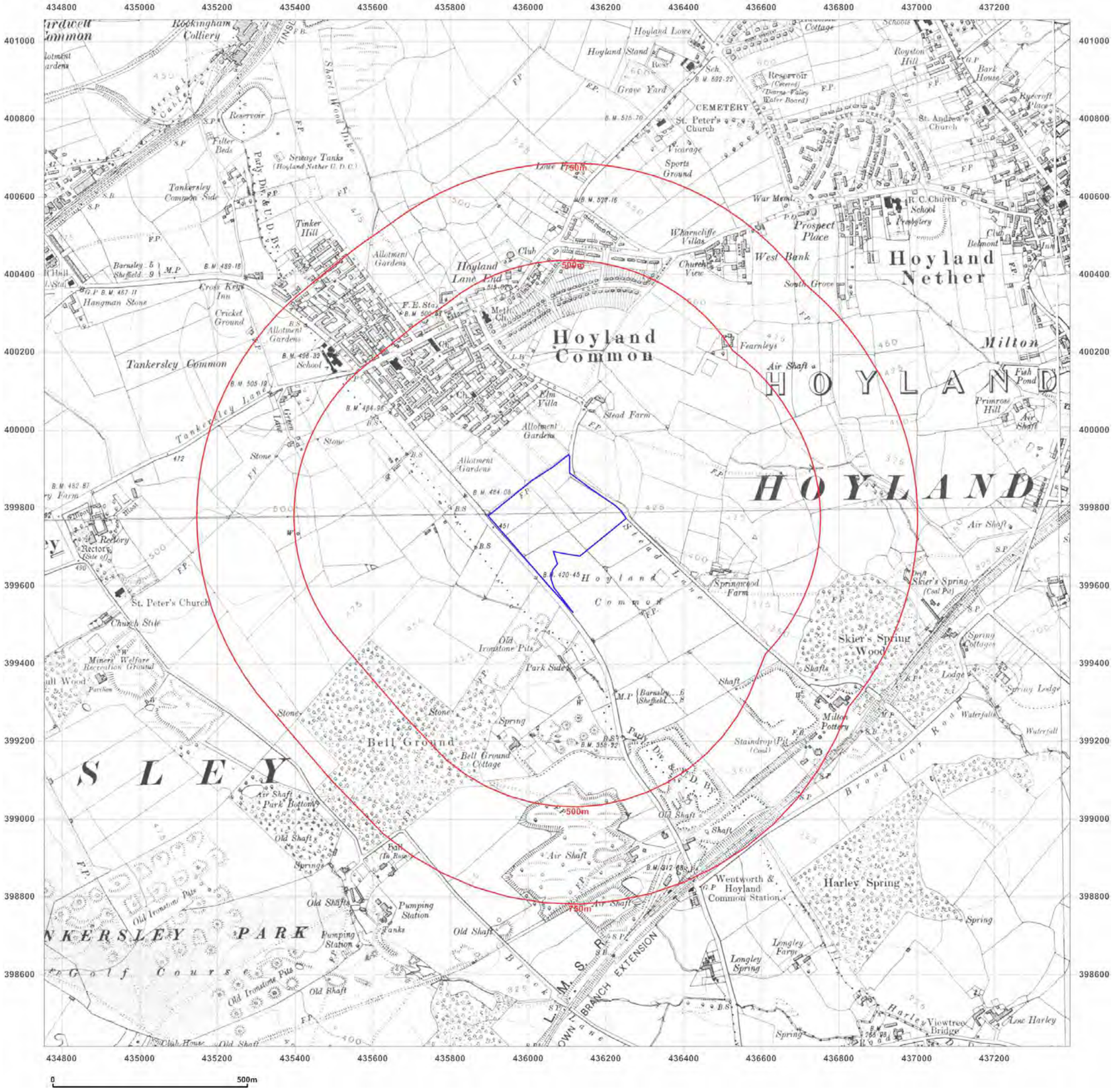

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Client Ref: EMS_625397_832707
Report Ref: EMS-625397_832707
Grid Ref: 436074, 399734

Map Name: County Series

Map date: **1929-1931**

Scale: 1:10,560

Printed at: 1:10,560

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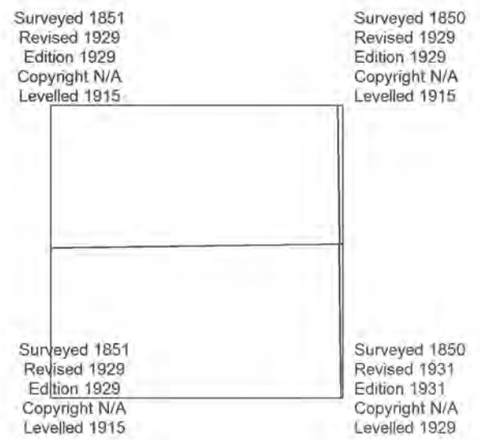

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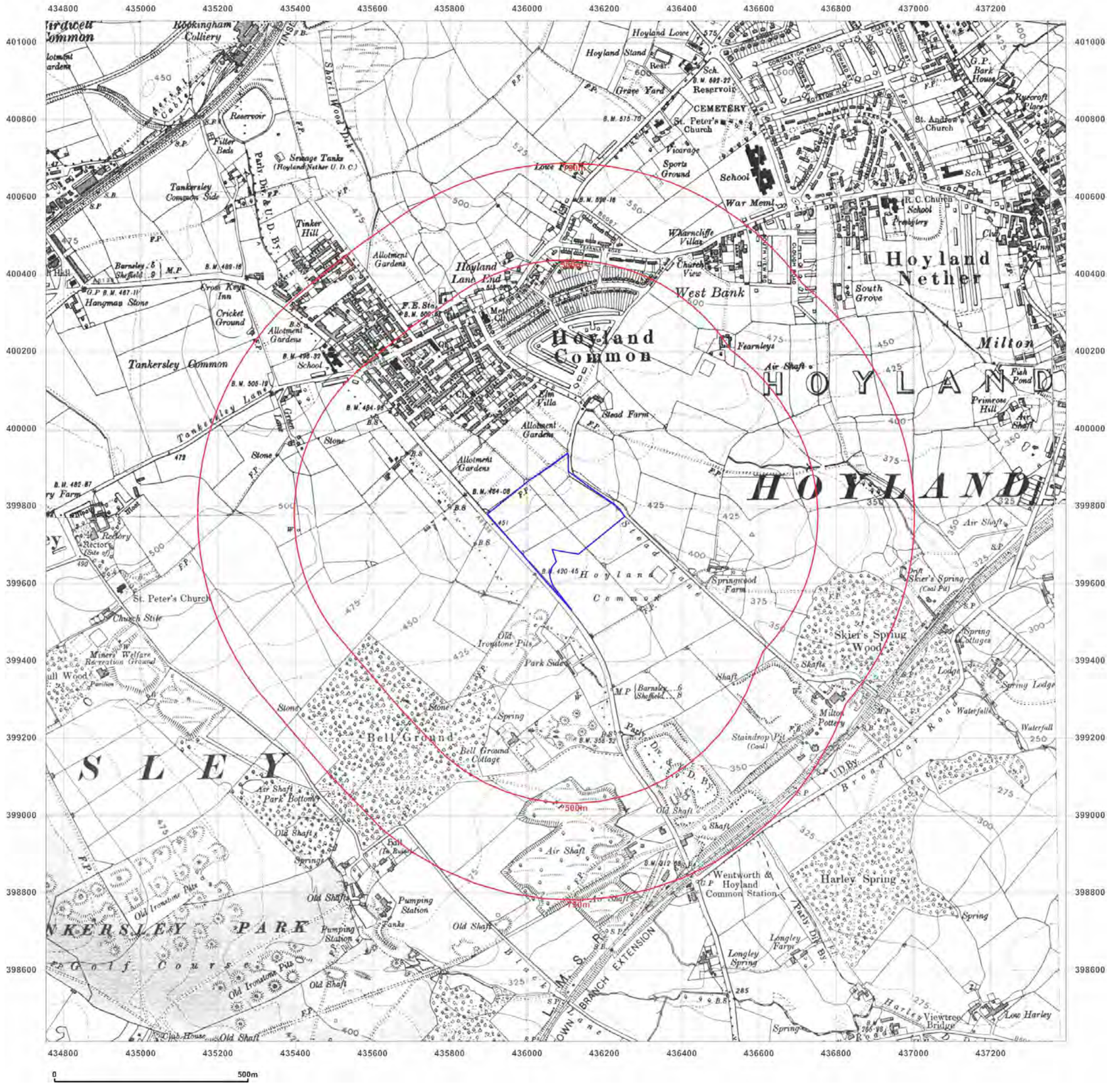

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Client Ref: EMS_625397_832707
Report Ref: EMS-625397_832707
Grid Ref: 436074, 399734

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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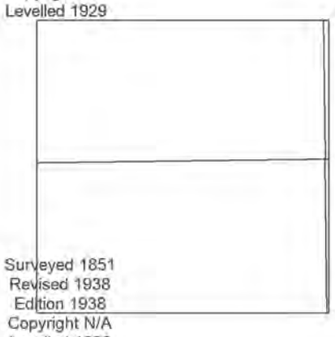

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