Abbeydale
Building Environment Consultants

DESK STUDY REPORT

JUNCTION 36 (M1), BIRDWELL, BARNSLEY, SOUTH YORKSHIRE

Report 151045DS September 2013

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1. INTRODUCTION

On the instruction of Barnsley Metropolitan Borough Council a desk study was carried out by Abbeydale Building Environment Consultants Ltd on a site off Junction 36 of the M1, Birdwell, Barnsley.

The site is located between Birdwell and Hoyland Common to the southwest of Barnsley and is centred within National Grid Reference square SE 349 003, at approximately 146m AOD. See Fig 1.

This report was produced on behalf of our client, Barnsley MBC and their advisors and financiers, and should not be relied upon or transferred to any other parties without the express written authorisation of Abbeydale BEC Ltd and our client. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

The comments and recommendations presented in this report are based on the findings of a review of available information. There may be other conditions prevailing on the site which have not been recorded by the available information and therefore have not been taken into account by this report. Responsibility cannot be accepted for unrecorded information.

When writing this report the proposed development was for modifications to the existing highways layout with provision for additional routes at, or close to, existing ground levels. If there are changes to these proposals, then some modification to the comments and recommendations given may be required.

2. OBJECTIVES

This report has been undertaken to evaluate current or former uses of the site or adjacent sites and the potential contamination they may have caused. As part of this evaluation the potential impact upon the identified receptors has been made, thus determining if there are any potential significant pollutant linkages present. If a potential significant pollutant linkage is identified, the report gives recommendations for further investigations and / or remediation.

The report also evaluates the current site proposals with regard to geotechnical and engineering considerations to determine what impact the existing ground conditions will have on the integrity of proposed highways. As part of this evaluation the report gives highway and drainage recommendations.

3. THE SITE

As part of the Phase 1 Desk Study assessment, a site walkover was undertaken on 22 August 2013, to determine the presence of any visually identifiable features that may pose a risk to the development proposed.

The existing Birdwell Junction layout consists of a double junction on the east side of the M1 at Junction 36 with Dearne Valley Parkway, extending to the north east as a dual carriageway to Rockingham Roundabout, whilst Sheffield Road crosses the Birdwell Junction to Hoyland Common in the southeast and towards the north to Birdwell as a single carriageway highway. See Fig 2. Rockingham Row is currently an access road for industrial premises, accessed from Sheffield Road only.

The full length of the existing highway is tarmac covered and bound by predominately agricultural grazing and derelict land. Rockingham Row is bound to the north by residential properties whilst to the south is industrial premises and warehouses. A highways depot is located just north of Birdwell Roundabout. All of the industrial areas appear to be covered with hardstanding. To the east of Birdwell Roundabout is commercial premises including a public house and community leisure centre, with residential properties beyond.

It is currently proposed to modify the layout of Birdwell Roundabout and create a through road between Sheffield Road (South) and Rockingham Roundabout adjacent to Cross Keys Lane. Additionally consideration is also being given to construct a new through road. between Sheffield Road (North) and Rockingham Roundabout along the existing Rockingham Row.

The highways are currently located on relatively level ground which, slopes down towards the motorway to the west and the land beyond the eastern extent of the scheme. Sheffield Road (South) is on a ridge of ground that gently rises towards Hoyland Common to the south.

4. HISTORY

The historic Ordnance Survey maps of the site and surrounding area, appended, have been obtained from Groundsure, dated 9 August 2013.

The Site

The earliest OS map of 1850 shows the site to be occupied predominately by agricultural land. Several of the existing highways, including Sheffield Road are shown. A Hangman's Stone is shown to the southern extent of the site, with a small pond beyond. The Barnsley and Sheffield Branch Railway is shown to run in cutting in roughly northeast-southwest direction along the northwestern extent of the site.

The 1891 map indicates the Rockingham Gas Works to the north of the railway. A quarry, later identified as Birdwell Quarry, is indicated to the east of the gas works adjacent to Sheffield Road. By the time of the 1903 map residential development has taken place along Sheffield Road, north of Hangman Stone, along with a Methodist

Chapel and Police Station. Additonal residential properties are shown along Rockingham Row.

By 1929 a new highway, indicated as Westwood Main Road, is present on the southwest corner of the site. The gas works are shown on maps to have been removed sometime between 1948 and 1951 with the site being subsequently developed into the National Coal Board (NCB) Central Workshops. Birdwell Quarry is indicated as disused on the 1965 map.

The Birdwell Junction was constructed to connect Sheffield Road with the M1 motorway prior to 1973. An electricity sub-station and engineering works are also shown, as part of the NCB workshops, whilst a highways depot is shown behind the residential properties along Sheffield Road. The existing road layout including a modified Birdwell Roundabout is shown on the maps to have been constructed between 1993 and 2002 along with the Dearne Valley Parkway. No further significant changes are indicated to the most recent available map.

Surrounding Area

The earliest map of 1850 shows the surrounding area to be predominantly undeveloped agricultural land with Tankersley to the south and Birdwell to the northwest. There is evidence of extractive activities in the surrounding area, namely old coal pits and localised quarrying to the west, northwest and northeast, and Wharncliffe Silkstone Colliery around 1.2 km to the southwest. A cluster of ironstone pits is recorded to the southeast, around 1km from the site, with a smaller number of ironstone pits a similar distance south of the site.

An increase in extraction industry is recorded on the subsequent map of 1891, when Rockingham Colliery is depicted 450m northeast of the site, adjacent to the railway, as well as a general increase in residential development around Hoyland Common; which continues on the later map of 1903. By 1903 a new railway line is shown to the north of the Sheffield and Barnsley Branch line, and there appears to be a lagoon or sludge bed to the east of Wharncliffe Silkstone Colliery, which on the 1929 map includes several ponds nearby the colliery.

Further urbanisation of the surrounding area is shown on the 1929 and subsequent maps, mainly residential development around Birdwell and Hoyland Common. However, some industrial developments are also shown including an aerial cable car to Rockingham Gas Works and an additional railway connection by 1938, both of which originate from Rockingham Colliery. Several features are illustrated adjacent to the various collieries, including a large area on the opposite side of the railway to Rockingham Colliery by 1948.

Post 1951 Wharncliffe Silkstone Colliery is no longer depicted and the features to the east of the colliery are annotated as tip (disused) by 1973, when The M1 motorway is shown to have been constructed. The 1977 map shows that the Wharncliffe Silkstone Colliery has already been decommissioned, along with the associated railway lines between the former colliery and Rockingham Colliery. To the northwest, the former Birdwell Quarry is labelled as disused. A noticeable increase in the size of the tip to

the southeast of Rockingham Colliery is recorded, including slurry ponds to the south of the reservoir. The later map of 1987 records the reservoir as tip (disused), and Rockingham Colliery is no longer shown.

Subsequent redevelopment of the former Wharncliffe Silkstone Colliery site is shown on the 2002 map, as well as completion of adjustment to the road layout from the M1 motorway and continued small scale residential development of the surrounding area.

No significant changes are then discernible to the most current map of 2012.

5. GEOLOGY

The Geological Survey maps of the area, BGS Sheet 87 and Yorkshire County Series Sheet 282NE have been examined along with the memoir of the area.

The site is shown to be underlain by undifferentiated carboniferous Middle Coal Measures (MCM) and unnamed sandstones dating to the Duckmantinian (Westphalian B) era. Later records indicate the unnamed sandstone as the Haigh Moor Rock. The Swallow Wood Coal is conjectured to outcrop within the site boundaries. Strata are indicated to be dipping to the northeast at between 4° to 7°. Drift deposits are not shown to overlie the solid geology within the site area.

A surface fault is conjectured through the site, trending in a general northwest - southeast direction, with strata dowthrown to the southwest. The fault is also indicated in the Silkstone and Parkgate Coal seams at depth under the site.

The Lidgett Coal seam (0.48m to 1.25m thick) is anticipated to outcrop approximately 500m to the west and may be located between 40m to 50m bgl. The memoir of the area indicates that the Lidgett Coal has been worked to the east of the village of Pilley, located to the west of the site. See Fig 1. Later records show the presence of the Haigh Moor Coal (1.04m to 2.15m thick) between the western site boundary and the Lidgett Coal seam. The Swallow Wood Coal seam (0.61m to 1.6m thick) is indicated to outcrop through the northwestern corner of the site.

The appended South Yorkshire Mining Advisory Service (SYMAS) report, dated 16 August 2013 additionly indicates the majority of the site to be underlain by the former Rockingham Opencast site. The Swallow Wood Coal is indicated to be 0.84m thick in the Tankersley Common Opencast to the southeast.

6. MINING

The presence of rock and mineral seams, including coal, which may have been mined or quarried in the area has been determined from the published geological maps, the memoir of the area and appended SYMAS report.

The published geological information indicates the Swallow Wood Coal, also known as the Top Haigh Moor, to outcrop through the west of the site trending roughly

north-south. Further thin coals also outcrop through the northeast corner of the site. The memoir record that where the crop crosses the railway near Birdwell only weathered coal and clay is visible. Archive records indicate that Rockingham Colliery recorded the Swallow Wood Coal, 0.93m thick at 20m bgl. Additionally the thickness reported corresponds closely with that from the SYMAS report, in the Tankersley Common Opencast (0.84m thick).

The Lidgett Coal is shown to outcrop to the west of the site and is noted in the memoir to be located approximately 55m below the Swallow Wood Coal, whilst records from Rockingham Colliery indicate the Lidgett Coal at around 66m below the Swallow Wood Coal. At this depth, any workings within the seam are not considered to pose a risk to the development.

Recent records would suggest the presence of a further coal seam, the Low Haigh Moor or Netherton Thin, outcropping between the Lidgett and Swallow Wood seams. The Low Haigh Moor and Top Haigh Moor are noted to become one seam in areas, although in cases this is due to the failure of the Low. As such the Low Haigh Moor is likely intermittent in the area and unlikely to have been worked on a large scale. It should be noted that no coal seams are recorded at the Rockingham Colliery, between the Swallow Wood Coal (20m bgl) and the Lidgett Coal (87m bgl).

Although the early geological maps do not record any shafts within the site boundary, the more recent geological map (dated, 2005) indicates the presence of two mine entrances immediately adjacent to Birdwell Roundabout. These are shown to have been worked in a northeasterly direction. However, the two mine entrances are not indicated in the SYMAS report which may suggest they were exploratory pits undertaken as part of the Rockingham Opencast. Given the sites location it is considered there may be a **moderate** to **high** risk of unrecorded shafts or mine entrances in the area.

The SYMAS report notes that the majority of the proposals, north of Birdwell Roundabout are underlain by the former Rockingham Colliery opencast works. It is noted that the southwestern boundary of the opencast correspond to the location of the two mine entrances identified from maps. The SYMAS report goes on to record that the Rockingham opencast was compacted back to provide a developable platform with backfill thicknesses varying between 2m to 10m The report identifies a further opencast site, the Tankersley Common Opencast to the southeast of the scheme although this is indicated to lie outside the area of the proposed works.

7. HYDROGEOLOGY

The Environment Agency (EA) indicate the site to be located on a Secondary A aquifer (formerly minor aquifer). The EA groundwater quality maps indicate that chemical quality is currently poor and is predicted to remain poor by 2015.

The site is not located within a groundwater source protection zone and there are no recorded licensed drinking water abstractions within 250m of the site.

The nearest surface water feature is Birdwell Dike approximately 300m to the west of the site. Birdwell Dike is indicated to currently not require assessment in accordance with EA chemical criteria. However, a further surface water course, Short Wood Dike, around 500m to the north is currently recorded to pass their criteria and it is predicted that in 2015 it will also pass. The ecological quality of Birdwell Dike is currently moderate and is predicted that in 2015 it will also be moderate whilst Short Wood Dike is currently poor with a 2015 predicted quality also of poor. The exact hydraulic gradient is unknown, however it is believed to have a gentle gradient towards Birdwell Dike with a small portion to the north of the site draining to Short Wood Dike.

Relevant EA maps / searches are appended.

8. ENVIRONMENTAL ENQUIRY

A Groundsure EnviroInsight report, dated 9 August 2013, indicates that there are no current recorded licensed landfill sites within 250m of the site. However, both the EnviroInsight report and an EA search record two historic landfill sites within 250m of the site (Map 2: ID's 5 and 6). Map ref 5 is indicated to be a backfilled railway cutting that is last reported by the EA to have received waste in 1989 with the license being surrendered in January 1992. It is understood that the cutting contains inert and commercial waste. Map ref 6 is noted in the EnviroInsight report as Birdwell Common Quarry. It is not indicated when this last received waste or the type of waste accepted.

The EnviroInsight report records one pollution incident (Map ID 1) within 500m of the site. The incident reported to have occurred in March 2003 with inert materials and wastes causing minor (Category 3) damage to water and land. The EA searches highlighted a major pollution incident to water around 350m to the west of the site. See appended EA maps.

The report also records four licensed discharge consents (Map ID's 2b, 3a, 4a and 5a) including three trade discharges (Map ID's 3a, 4a and 5a) and one sewerage discharge (Map ID 5a). The trade discharges are currently licensed to Cross Key Lane Works and consist of surface water drainage. The sewerage discharge is licensed to G.B Truck Services Ltd. These are reported to discharge to Short Wood Dike and a tributary of Shortwood Dike.

The relevant Groundsure pages and EA maps are appended.

9. WALKOVER OBSERVATIONS

A site walkover was undertaken on 22 August 2013 by Abbeydale BEC to determine the presence of any visually identifiable features that may pose a risk to construction workers or future site users. Features noted during the site walkover were assessed relative to existing site features and their approximate locations are shown on Fig 3.

The existing highways from Birdwell Roundabout to Rockingham Roundabout and along Sheffield Road to Cross Keys Lane were found to be tarmac covered, with associated layby and commercial premise junctions. Rockingham Road was also tarmac covered, but with differences in surface conditions, suggested repairs and re-surfacing had been undertaken.

The north of Rockingham Row was bound by residential housing to the north that was partially separated by wood panel fencing and a grass verge to the eastern end. The western end of the road had garages to the north, likely associated with the housing beyond. The south of Rockingham Row was bound by industrial premises including steel works and hydroponics warehouses. It is understood that the warehouses to the south at least partially overlie the backfilled historic railway line. Dearne Valley Parkway was a tarmac covered dual carriageway that was bound on the west by derelict land (former opencast site) whilst to the east was grassed agricultural fields currently used for grazing horses. The ground in the area of the opencast site consisted of a grey gravelly clay with many sandstone and coal cobbles and was generally covered by grasses with some more developed shrubs and trees noted. A shallow ditch was noted to run around the outside of the backfilled opencast area to a depth of around 0.5m. Although generally dry there were localised small areas of damp ground noted. The surface of the opencast appeared level with no obvious areas of subsidence noted.

Between Birdwell Roundabout and the highways depot was a small tree belt with a low stone wall in the approximate location of two historic adits. Several low stockpiles were contained within the tree belt with a small 1m x 0.5m x 0.3m deep ditch noted. There was no other sign of the mine entries. The proposed new route adjacent to Cross Keys Lane was noted to pass over agricultural fields. No cracking was noted to the existing highway, except along the edge of the currently disused left turn at Rockingham Roundabout. Some minor cracking was also noted in the footpath adjacent to the tree belt at the highway depot.

Although not included as part of the proposed scheme it should be noted that the western boundary walls for the industrial premises showed signs of cracking and movement. Additionally although the residential properties immediately west of the highways depot appeared to have been re-mortared recently, some signs of cracking were still visible suggesting movement.

Ground levels across the scheme are relatively level at around 142m AOD, but slope down beyond the western extent of the scheme. The surrounding topography also rises gently towards the south and southwest of the scheme.

No surface water was recorded during the walkover, however archive records indicate the presence of a drain at the eastern end of Rockingham Row, adjacent to the opencast area.

10. LABORATORY TESTING

No laboratory testing has currently been undertaken.

11. GROUND CONDITIONS

From the maps and archive boreholes it is anticipated that a thin covering of made ground and residual soil overlies undifferentiated Middle Coal Measures bedrock, form of mudstones and siltstones, across most of the site area. The exceptions are the areas of former opencast mining where greater depths of made ground are anticipated. The SYMAS opencast backfill records indicate infill depths of between 2m to 10m bgl. From the information available a section has been drawn to indicated the anticipated ground conditions across the site. See Fig 6.

12. ENVIRONMENTAL ASSESSMENT

12.1 General

Contaminated land is defined under law through Part IIA of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995. This supports a 'suitable for use' based approach to the risk assessment of contaminated land. The evaluation is based upon an assessment of plausible pollutant linkages, referred to as the **contaminant - pathway - receptor** model, based upon the current or proposed use of the site.

A **pollutant linkage** is the relationship between a contaminant, a pathway and a receptor, unless all three elements are present a potential pollutant linkage does not exist.

Part IIA states for land to be considered contaminated by the local authority in whose area it is situated it needs to be in such a condition, by reason of substance in on or under the land that :

1. Significant harm is being caused or there is significant possibility of such harm being caused.

2. Pollution of controlled waters is being or is likely to be caused.

12.2 Contamination Assessment

12.2.1 Exploratory Hole Locations and Sampling Strategy

As no specific source of contamination has been identified from the phase 1 Conceptual Model, underlying the site, generally non-targeted exploratory hole locations and sampling can be employed. However, it may be recommended to undertake environmental sampling in the area of Rockingham Row due to the historical presence of the gas works to the south.

The location of exploratory holes may be restricted by existing services in the highway and appropriate traffic management would be required to ensure a safe working environment.

12.2.2 On-Site Contamination

The potential risk of contamination on the site has been assessed by reference to the tables in Appendix A.

The site is shown in historic records to have been occupied by a combination of highways and agricultural land from at least 1850, with a subsequent **low** risk of contamination. The opencast areas were likely backfilled with waste overburden material, but there is no information currently available to confirm this. Consequently there may be localised contamination hotspots within the underlying ground materials which with a **moderate** risk of contamination.

There was no observed visual or olfactory evidence of contamination during the walkover. Although no evidence of on site of contamination was observed, the made ground and backfilled opencast areas were highlighted as the most likely potential source of contamination, therefore will need to be focused on in a subsequent investigation.

The existing hardstanding materials in the highway construction break any potential pollution pathways between contamination in the underlying ground materials and existing site users.

12.2.3 Off-Site Contamination

Two historic landfill sites have been recorded within 250m of the scheme. The nearest landfill (Map ID 5) is a backfilled railway cutting and is recorded to contain generally inert material although, there may be some hotspot sources of contamination remaining which if mobile would have a **low** risk of affecting the proposed development.

A historic gasometer to the south of Rockingham Row may present a legacy source of contamination and consequently investigation may be required depending on the infrastructure being proposed. However, for a highway the potential pollution linkages between any contamination and future site users is **low**.

One pollution incident has been recorded adjacent to the existing Birdwell Roundabout. It involved inert materials and demolition waste which having been removed is not considered to pose a significant risk to the proposed developments.

12.2.4 Potential Receptors

- Future site users.
- Vegetation.

- Ecological Systems.
- Construction workers.
- Surface water.
- Groundwater.
- Buildings/substructures.
- Adjacent site users.

12.2.5 **Potential Pathways**

- Dermal contact (indoor & outdoor).
- Ingestion of soil and indoor dust.
- Indirect ingestion (indoor & outdoor).
- Inhalation of dust (indoor & outdoor).
- Inhalation of vapours (indoor & outdoor).
- Leaching to groundwater.
- Surface water run-off.
- Direct contact with substructures.
- Migration through the ground (vertical and horizontal).

12.2.6 **Proposed Site Use**

The current development proposal for the site is for modifications to the existing highways layout with the provision for future additonal routes. This end-use is classified as **low** sensitivity. Future site users will have no direct contact with the underlying ground materials and will not be exposed to any contaminants contained.

12.4 **Flood Risk**

The EA maps indicate that the proposed development is outside areas of past flooding and so has a low chance of flooding from external sources. When developing the site, drainage measures to meet with the local authority sustainable drainage system (SUDS) requirements will need to be made for any onsite drainage.

12.5 **Ground Gas**

In accordance with HPA-RPD-033:2007 the site is illustrated to be in a location where Radon protection measures are not required. BGS maps confirm the above with the Middle Coal Measures strata only having a moderate potential for radon emissions.

The nature of the material used to backfill the opencast areas is currently unknown. Consequently there is the potential for the generation of ground gases in the area which would result in a **moderate** risk. However, if no enclosed spaces are proposed as part of the scheme the risk of accumulation and harmful effects from ground gas is considered to be **low.**

Unless any enclosed spaces are proposed, ground gas emissions will not be of concern to the scheme. Should any enclosed spaces or buildings be included as part of the scheme, it would be prudent to to incorporate basic ground gas protection as a precautionary measure, due to the backfilled opencast site and the historical industry

12.6 Japanese Knotweed

The existing vegetation in and around the site has been examined. No obvious signs of Japanese Knotweed were visible although it is possible that Giant Hogweed is present in the tree belt just south of the depot. As Japanese Knotweed or other invasive species could have been surface stripped or weedkiller applied to the stems prior to a site visit, not seeing the weeds during our time on site cannot be a guarantee that they are not present on or around the site.

12.7 Risk Assessment

Risk has been assessed with regards to the tables in appendix A and is based on the Phase 1 Desk Study findings presented above.

Although potential sources of both on-site and off-site contamination have been identified, the proposed use of hardstanding materials across the scheme will effectively break any migration pathways between any contaminats and future site users. However, there remains a limited exposure to underlying contamination for groundworkers whilst carrying out the development proposals.

Chemical testing would be required to determine the presence and extent of any contamination hotspots and to assess the risks posed to ground workers.

Unless enclosed structures are to be incorporated into the scheme there is no risk associated with ground gas generation or migration.

12.8 Conceptual Model

The conceptual model is based on the **source-pathway-receptor** model and uses the information presented above, to determine if a possible significant pollutant linkage exists and what risks are posed to human health and environmental receptors.

The conceptual model is shown graphically on Fig. 4 and tabulated on Fig 5. See Appendix B for conceptual model risk matrix.

12.9 Remediation Requirements

The current proposed highways hardstanding will break pathways between any sources of contamination in the ground and future site users. However,

chemical testing is recommended in landscape areas or where potential sources of landscape material is required.

Although it is understood that no enclosed structures or buildings are to be incorporated into the final scheme, should the proposals be altered it would be prudent to assume the incorporation of at least basic ground gas protection measures, unless gas monitoring is undertaken and prove oterwise.

13 ENGINEERING CONSIDERATIONS

13.1 General

An outline plan was available when completing this report. It is proposed to modify the existing road layout and Birdwell Roundabout, with additional routes being added at, or close to, existing ground levels. It is understood that no permanent structures are to be created as part of the scheme. If there are any changes to these proposals, then some modification to the comments and recommendations given may be required.

13.2 Mining

Coal seams are indicated to outcrop through the site and have been worked historically by opencast methods under the eastern area of the scheme. It is anticipated that as part of the opencast workings two adits were located to the southwest of the scheme. The Rockingham Opencast site is reported by SYMAS to have been compacted back to provide a stable building platform in 1995. Consequently it is possible that appart from surface preparation no further engineering of the backfill will be required. However, investigation should still be undertaken to determine the existing conditions and depth of backfilled materials.

Where outcropping within the formation, the coal should be removed where within 1.0m of the surface. The remaining face of coal should be sealed. Where under the highway a minimum 0.5m of concrete cover should be provided. However, in other areas a clay seal could be considered.

At the western end of Rockingham Row archive records indicate the presence of a former watercourse and drain. Although surface water was not observed during the walkover, a change in vegetation was observed suggesting wetter and softer ground conditions.

13.3 Highways

Past developments adjacent to some areas of the highways will result in various depths of made ground. Some of the more recent highway developments including Dearne Valley Parkway may be partially founded on made ground. It is anticipated that the greatest depths of made ground would be located in the area of Rockingham Row and the existing Rockingham

roundabout. To determine the ground conditions an intrusive ground investigation is recommended.

Where the proposed highways cross the faults or opencast highwalls, some differential movement may occur. Consideration needs to be given to stepping and using Geo-Grid in the highway construction to spread differential movement.

At this stage, for design purposes it can be assumed that existing soft/firm or loose made ground should be removed from under the footprint of the highway and at least 1m + 45 degree line down to a suitable founding strata. If varying depths of made ground are encountered beneath the existing highway a geo-grid could be used to limit the extent of the excavation beyond the highway boundary. Having proof rolled a suitable sub-formation layer highway fill should be stepped and compacted back in layers to SHW. To limit differential movement a granular rather than cohesive backfill should be used.

13.4 Drainage & Excavatability

Some difficulties in excavation of trenches for sewers and foundations in the made ground and bedrock should be anticipated. Consideration should be given to providing safe temporary support of excavations within made ground or where greater than 1.2m deep.

In view of the anticipated ground conditions, soakaways are unlikely to be suitable for this site. However if soakaways were to be considered it is recommended that soakaway tests are carried out at proposed locations to determine the size requirements. The soakaways and corresponding tests should be located at least 5m from any adjacent properties.

13.5 Chemical Precautions

In the absence of chemical testing data it is recommended that a sulphate resistant concrete be used for any sub-surface structures. Additionally as with all highway works, consideration should be given to the effects of salting the roads.

14. REGULATORY APPROVAL

The recommendations given in this report are based on the findings of the Desk Study, undertaken as described. The conclusions cannot be guaranteed to gain regulatory approval, should the report be required as part of a planning application. If it is required as such, it should therefore be passed to the appropriate authorities for comment and approval, prior to undertaking any remediation or development work.

15. DISPOSAL OF SOILS

Any wastes arising from remediation and/or development of the site, such as excess spoil or material deemed unsuitable for retention on site, should be disposed of in accordance with the Duty of Care Regulations. Waste Acceptance Criteria (WAC) analysis would be required to determine the most appropriate disposal facility for the waste, in accordance with the requirements of the current Landfill Directive.

16. FURTHER INVESTIGATION

An intrusive site investigation is recommended prior to the commencement of any groundworks to assess the existing ground conditions across the site and obtain samples for relevant environmental and geotechnical testing.

The investigation and assessment should establish areas of contamination and what appropriate remediation and mitigation measures may be required. As no specific source of contamination been identified from either the walkover or from the above information, generally non-targeted exploratory hole locations and sampling will need to be employed focasing on areas of past disturbed ground.

It is also recommended that the adits within the area of the existing depot adjacent to Birdwell Roundabout are further investigated. If voids exist below ground level these will likely require treatment.

17. SUMMARY

- A section of the existing highway along Sheffield Road is indicated to have been present since at least 1850. The M1 motorway is shown to have been in place since at least 1973 with Birdwell Roundabout the Dearne Valley Parkway being added between 1993 and 2002.

- The ground conditions anticipated are made ground over residual soil, over undifferentiated Middle Coal Measures bedrock.

- Shallow mining is unlikely to affect the site. However, the majority of the proposed scheme is underlain by historic opencast workings and differential movement may be anticipated along quarry highwalls.

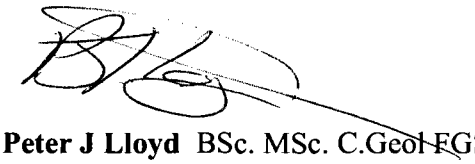
- Exposed shallow thin coal seams will require protection, whilst indicated adits should be investigated further.

- The proposed highway works should be undertaken on re-engineered material with a minimum CBR or 2.5%.

- Chemical testing will be required to identify any contamination hotspots that may pose a risk to construction workers or future site users.

- If buildings or enclose spaces are proposed basic ground gas protection measures are recommended.
- The site lies outside areas susceptible to 100 year flooding.
- Soakaways are unlikely to be suitable for the proposed scheme.
- A Site Investigation will be required.

For and on behalf of Abbeydale BEC Ltd.

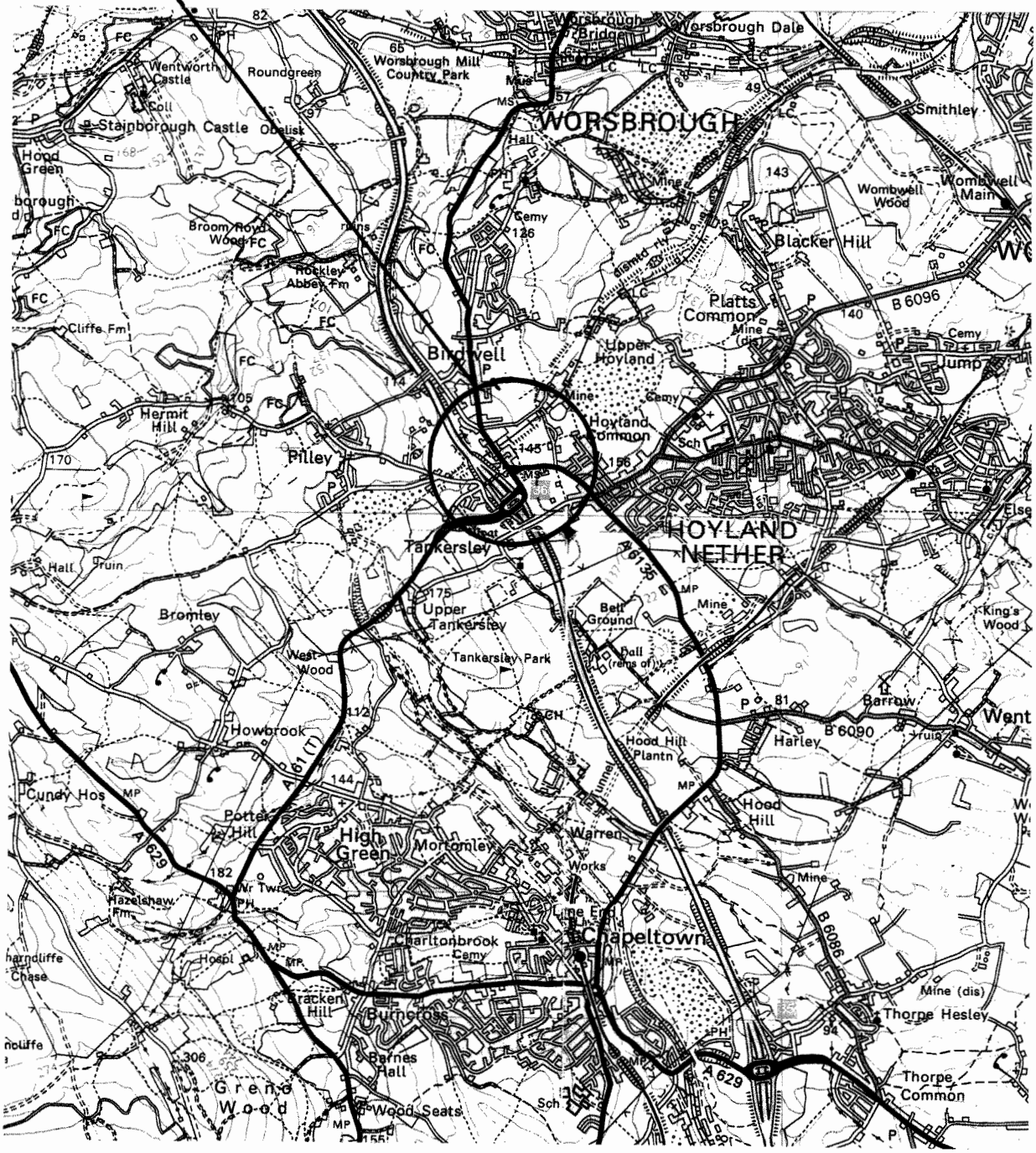


Peter J Lloyd BSc. MSc. C.Geol FGS.
Senior Geologist
Report 151045DS/MW/PJL September 2013.

FIGURES

N

THE SITE



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Measurements should not be scaled from this plan

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KEY PLAN

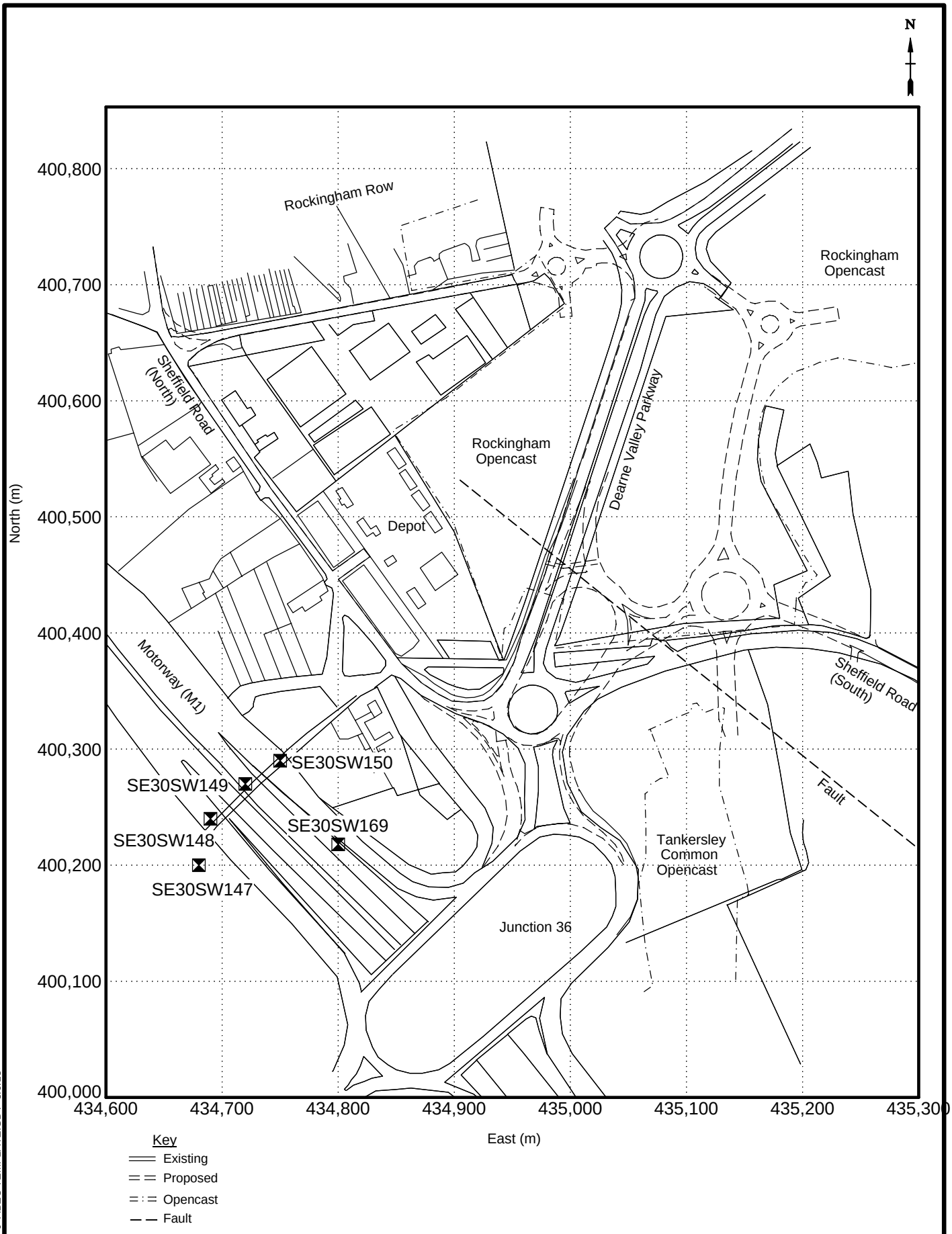
Client: Barnsley MBC

Project: J36, Birdwell, Barnsley

Number: 151045

Fig 1

*FIG 1 KEY PLAN 151045.GPJ ABEC TEMPLATE.GDT 4/9/13



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SITE PLAN

Client: Barnsley MBC

Project: J36, Birdwell, Barnsley

Number: 151045

Fig 2

*FIG 2 SITE PLAN 151045.GPJ ABEC TEMPLATE.GDT 3/9/13

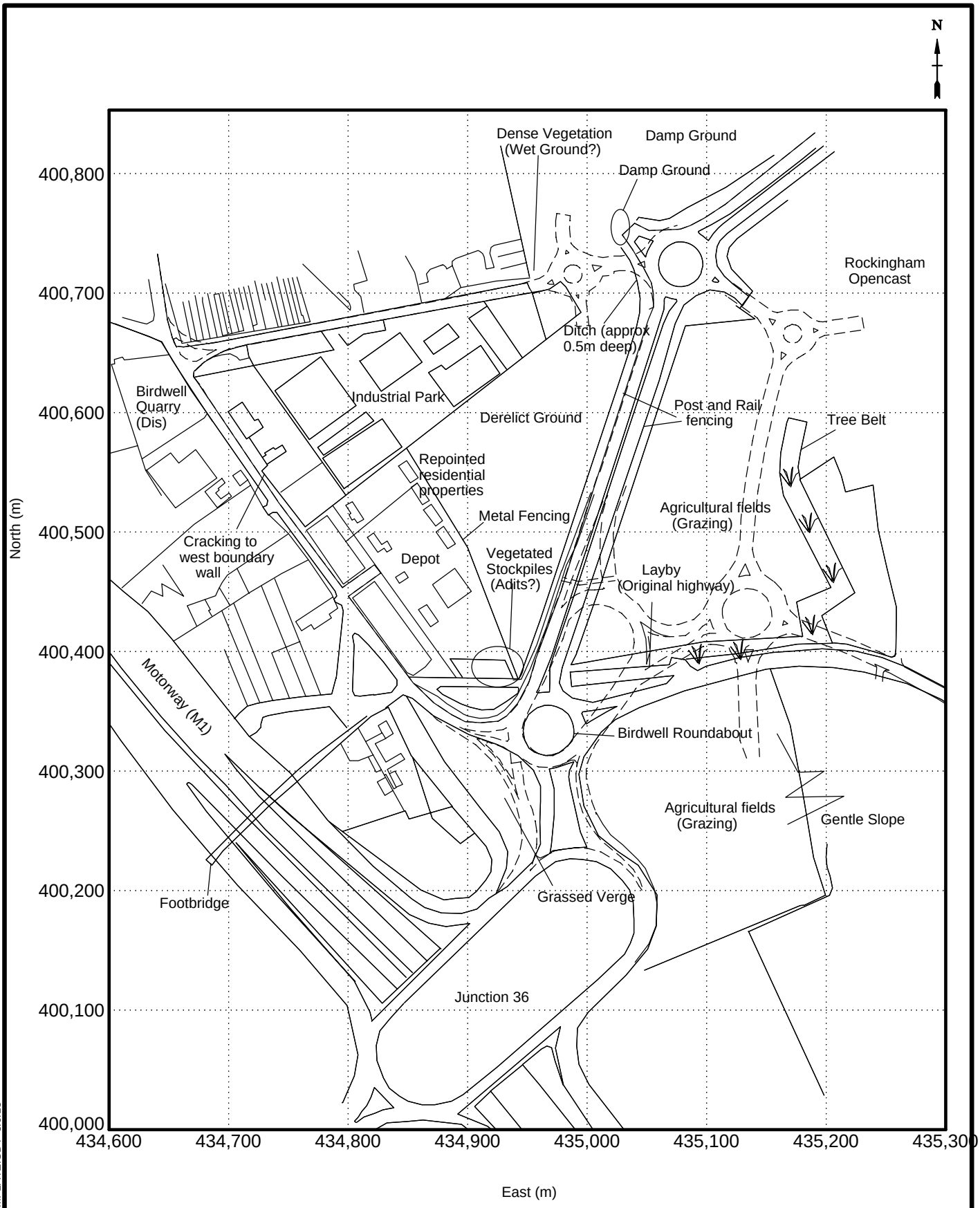


*FIG 2 SITE PLAN 151045.GPJ ABEC TEMPLATE.GDT 3/9/13

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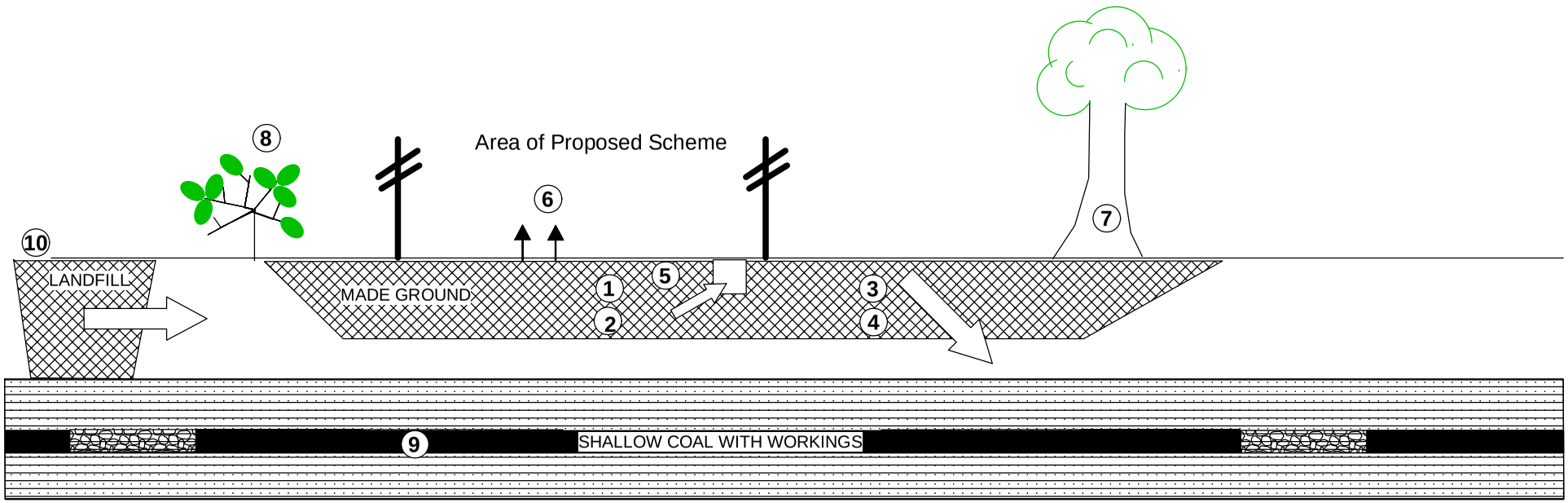
WALKOVER OBSERVATIONS

Client: Barnsley MBC

Project: J36, Birdwell, Barnsley

Number: 151045

Fig 3



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Notes: > NOT TO SCALE. This model is schematic only and does not reflect the specific ground conditions identified on or off the site.
> See Fig 5 for Conceptual Model Table

CONCEPTUAL MODEL

Client: Barnsley MBC

Project: J36, Birdwell, Barnsley

Number: 151045

Fig 4

MODEL 151045.GPJ ABEC TEMPLATE.GDT 23/8/13

Number	Hazard	Source	Pathway	Receptor	Significant Pollutant Linkage	Current anticipated risk (1) *	Comment	Action	Anticipated risk after action *
1	Metals	Made Ground	Direct contact	Construction workers	**Yes**	Low / 50%	Site Investigation required	Subject to SI findings	Low
2	PAH	Off site Gasometer	Direct contact	Construction workers	**Yes**	Low / 25%	Site Investigation required	Subject to SI findings	Low
3	Leachable metals	Made Ground	Leaching to groundwater	Groundwater	**Yes**	Low / 50%	Site Investigation required	Subject to SI findings	Low
4	Leachable PAH	Off site Gasometer	Leaching to groundwater	Groundwater	**Yes**	Low / 25%	Site Investigation required	Subject to SI findings	Low
5	Sulphate	Colliery Spoil	Direct contact	Concrete Sub-structures	**Yes**	Moderate / Low 100%	Site Investigation required	Subject to SI findings	Low
6	Mine / Ground Gas	Mine Workings	Through the ground	Construction workers	**Yes**	Low / 100%	No precautions required unless enclosed spaces are proposed	Dependant on final developmen proposals	Low
7	Trees	Off site trees	Direct contact	Buildings / structures	**Yes**	Low / 50%	No risk at levels present	Dependant on final developmen proposals	Low
8	Japanese Knotweed	Off site trees	Direct contact	Concrete Sub-structures	**Yes**	Low / 100%	None identified during walkover	Vigilance during construction	Low
9	Mine working collapse	Mine Workings	Through the ground	Buildings / structures	**Yes**	Low / 75%	Site Investigation required	Subject to SI findings	Low
10	Landfill	Off site landfill site	Through the ground	Site users	**Yes**	Low / 25%	Site Investigation required	Subject to SI findings	Low

(1) Anticipated risk over percentage site area

* See Appendix B

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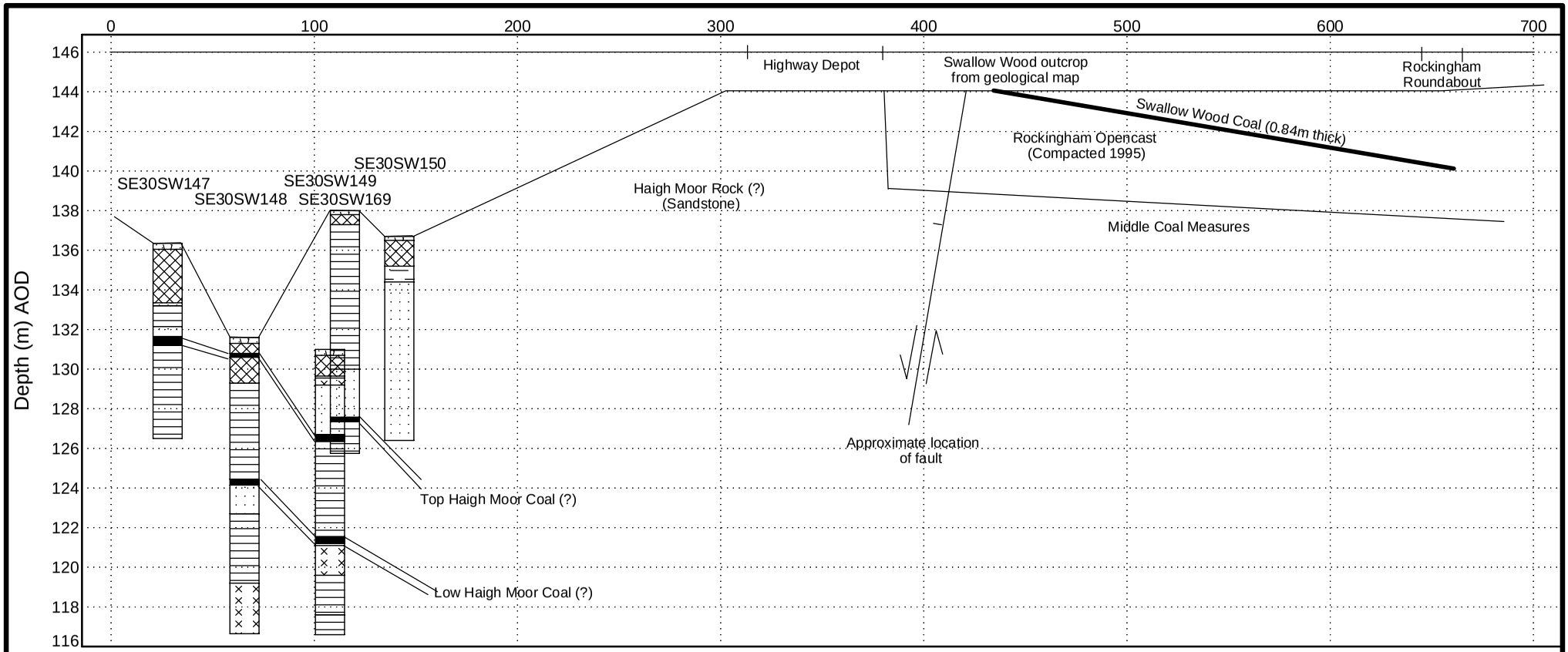
CONCEPTUAL MODEL TABLE

Client : Barnsley M.B.C

Project : J36 (M1), Birdwell, Barnsley

Job No : 151045

Fig 5



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N

ANTICIPATED GROUND CONDITIONS

Client: Barnsley MBC

Project: J36, Birdwell, Barnsley

Number: 151045

Fig 6

DEPTH SECTION 151045.GPJ ABEC TEMPLATE.GDT 3/9/13

HISTORIC EXPLORATION LOGS

CITY OF SHEFFIELD
Building Standards Department.
Town Hall
SHEFFIELD S1 2HH.

GEOTECHNICAL SERVICES

CLIENT :- DEPARTMENT OF TRANSPORT
ENGINEER :- SIR OWEN WILLIAMS & PARTNERS

SITE :- BIRDWELL QUARRY FOOTBRIDGE

BOREHOLE No. 1
SHEET 1 of 1

DRILLING METHODS :- Rotary open hole and coring using air/mist flush, producing 87mm dia core in rigid liner.

GROUND LEVEL :- 136·35m. A.O.D.

COORDINATES :- E N

DATE :- 28-29/7/93

SCALE :- 1:50

MAIN DESCRIPTION	DETAILS	Legend	Depth	Reduced Level	Coring Details	Samples / Insitu Tests: Depth (m)	Type No.	Test Result	Date	Casing Depth (m)	Water Depth (m)	St'pipe/ Piezo
Dark brown clayey TOPSOIL with rootlets.			(0·30) 0·30	136·05								
Stiff grey and brown friable clay with fragments of mudstone, limestone and sandstone with occasional brick and ash. (MADE GROUND)			(0·90) 1·20	135·15	OPEN HOLE	0·60–0·80	1 B					
Grey and brown fine to coarse gravel of mudstone in stiff grey clay matrix. (MADE GROUND)			(1·80)			1·50	2 S	(11)				
Brown moderately weathered jointed fine to medium SANDSTONE, very weak with occasional coal partings.	Occasional fragments of red shale and white ganister.		3·00	133·35		2·70	3 S	(35)				
			3·15	133·20		3·15		If	28/7	2·70	Dry	
Grey and brown thinly bedded moderately weathered silty MUDSTONE very weak with bands and partings of sandstone. Occurring as interlocking fragments with many ironstained surfaces.	Closely spaced sub-vertical and steeply inclined planar iron-stained joints. Occasional plant fossils including Neuropteris.		(1·05)		t = 100 s = 0 r = 0			Gen NI	29/7		Dry	
Light grey and orange brown medium bedded, slightly weathered fine to coarse SANDSTONE, moderately strong with coal stringers.	Moderately weathered Vertical planar ironstained joint. 10°		(0·50) 4·70	132·15		4·20 4·40	4 S	(66 for 75mm)				
Black Cannel COAL, moderately weak with mussels.	Sub vertical planar smooth ironstained joint. Speckled with pyritic laminated carbonaceous MST.		(0·45) 5·15	131·65	t = 100 s = 0 r = 48	4·90		250				
Grey very thinly occasionally thinly bedded moderately weathered MUDSTONE, very weak with occasional ironstone bands.	Highly weathered to soft grey clay Generally heavily fractured often occurring as inter-locking fragments. Carbonaceous mudstone		(2·45)	131·20	t = 93 s = 11 r = 0	6·40 6·60	5 S	NI - 50 NI [NI - 100] (50 for 45mm)				GROUT
	Occurring as inter-locking fragments with clay veneered and infilled fractures.		7·60	128·75	t = 97 s = 10 r = 7			NI				
Grey very thinly to medium bedded. Slightly in part moderately weathered MUDSTONE, very weak and weak with ironstone bands.	Very closely and closely spaced steeply inclined planar smooth jointing. Occasional clay infilled bedding planes Occasional steeply 10° inclined planar smooth joints.		(2·25 plus)		t = 93 s = 34 r = 35	8·10		NI - 70 40 [NI-220]				
			9·85	126·50		9·60 9·85	6 S	(58 for 75mm)	29/7	2·70	7·55	
[BOREHOLE TERMINATED AT 9·85m]												

KEYS	CORES	SAMPLES / INSITU TESTS	TESTS	NOTES/REMARKS/GROUNDWATER DETAILS.
	Presumed area of core loss.	Undisturbed sample (attempted but not recovered shown dotted)	P pH and sulphates	NI - Non intact
t	Total recovery %	B Bulk disturbed	Q Quick undrained triaxial	
s	Solid recovery %	D Small disturbed	CO Consolidation	
r	R.Q.D. %	W Water	PSD Partical size distribution	
If	Fracture spacing (mm)	C or S - SPT cone or spoon (25) - N value	UCS Unconfined comp. strength	
3·8 x	Depth groundwater struck (m) and depth		LP Liquid/Plastic limits	

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GEOTECHNICAL SERVICES

CLIENT :- DEPARTMENT OF TRANSPORT
ENGINEER :- SIR OWEN WILLIAMS & PARTNERS

SITE :- BIRDWELL QUARRY FOOTBRIDGE

BOREHOLE No. 2
SHEET 1 of 2

DRILLING METHODS :- Rotary open hole and coring using air/mist flush, producing 87mm dia. core in rigid liner.

GROUND LEVEL :- 131·60m. A.O.D.

COORDINATES :- E N

DATE :- 30/7 - 3/8/93

SCALE :- 1:50

MAIN DESCRIPTION	DETAILS	Legend	Depth	Reduced Level	Coring Details	Samples / Insitu Tests: Depth (m)	Samples / Insitu Tests: Type No.	Samples / Insitu Tests: Test Result	Date	Casing Depth (m)	Water Depth (m)	St'pipe/ Plaza
Brown sandy gravelly TOPSOIL with rootlets.			0·30 (0·30)	131·30								
Brown/dark brown clayey gravelly sand with occasional layers of limestone gravel (MADE GROUND)			0·80 (0·50)	130·80								
Black dense macadam.			1·00	130·60	OPEN HOLE							
Dark grey/brown clayey sand and gravel of ash, sandstone, limestone and brick with occasional sandstone cobbles. (MADE GROUND)			(1·30)			1·50 1·50–1·95	1 B S	(7)				
Grey fractured moderately weathered MUDSTONE, very weak.			2·30 (0·75)	129·30		2·60	2 S	(42)				
		P	3·05	128·55		3·05		If	30/7	2·80	Dry	
Grey, very thinly and thinly bedded moderately weathered, MUDSTONE, very weak with occasional ironstone bands.	Generally very closely spaced sub vertical planar smooth jointing, in parts fractured. Occasional plant fossils	P	(1·10)		t = 92 s = 9 r = 9			NI NI (NI - 120)	2/8	2·80	1·90	
Black and dark grey laminated highly weathered MUDSTONE and carbonaceous MUDSTONE, very weak to moderately weak.	Slightly weathered moderately weak carbonaceous mudstone. Highly fractured Carbonaceous mudstone with abundant mussels.		4·15 (0·75)	127·45		4·35 4·65	3 S	(75 for 150mm) NI				
Grey / dark grey very thinly and thinly bedded moderately weathered, MUDSTONE, very weak with occasional ironstone bands.	Generally fractured occasionally highly fractured and highly weathered. Some clay infilled bedding planes. Very closely and closely spaced sub vertical and steeply inclined planar smooth intersecting jointing		4·90 (2·90)	126·70	t = 96 s = 18 r = 0 t = 100 s = 0 r = 0	5·95		NI (NI - 80)				
Black thickly laminated slightly weathered carbonaceous MUDSTONE, weak with ironstone bands.	Sub vertical planar joint Calcite mineralization on stone clast planes.		7·00 (0·30) 7·15	124·60 124·45				Gen NI				
Black cleated bright COAL with partings of pyrite.			7·45 (1·55)	124·15	t = 100 s = 40 r = 80	7·45		110				
Light grey and grey thinly and medium bedded slightly weathered fine SANDSTONE with siltstone laminae and partings, moderately strong in part strong	Occasional insitu plant fossils and small ironstone nodules. Steeply inclined and sub vertical rough intersecting joints. Increase in siltstone partings with depth displaying small scale cross bedding. Occasional stromacia.		8·90	122·70		8·05 9·05	4 S	(NI - 250) (50 for 40mm)				
MUDSTONE (see following sheet)		P P P			t = 100 s = 28 r = 43							

GROUT

KEYS	CORES	SAMPLES / INSITU TESTS	TESTS	NOTES/REMARKS/GROUNDWATER DETAILS.
	Presumed area of core loss.	Undisturbed sample (attempted but not recovered shown dotted)	P pH and sulphates Q Quick undrained triaxial CO Consolidation PSD Partical size distribution UCS Unconfined comp. strength LP Liquid/Plastic limits	NI = Non Intact S.P.T. tool wet at 1·50m No ingress recorded
t	Total recovery %			
s	Solid recovery %			
r	R.Q.D. %			
I_f 3-8	Fracture spacing (mm)	B Bulk disturbed		
		D Small disturbed		
		W Water		
x	Depth groundwater struck (m) and depth	C or S - SPT cone or spoon		

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GEOTECHNICAL SERVICES

CLIENT :- DEPARTMENT OF TRANSPORT
ENGINEER :- SIR OWEN WILLIAMS & PARTNERS

SITE :- BIRDWELL QUARRY FOOTBRIDGE

BOREHOLE No. 2
SHEET 2 of 2

DRILLING METHODS :- As sheet 1

GROUND LEVEL :- 131·60m. A.O.D.

COORDINATES :- E N

DATE :- 30/7 - 3/8/93

SCALE :- 1:50

MAIN DESCRIPTION	DETAILS	Legend	Depth	Reduced Level	Coring Details	Samples / Insitu Tests: Depth (m)	Type No.	Test Result	Date	Casing Depth (m)	Water Depth (m)	St'pipe/ Piezo
Grey very thinly and thinly bedded, slightly in part moderately weathered MUDSTONE, very weak and weak with occasional ironstone bands.	Fracturing and increased weathering adjacent to some bedding planes.				t = 100	10·45		120				GROUT
	Sub vertical and steeply inclined, occasionally inclined planar smooth jointing in part very closely spaced and intersecting.		(2·50)		s = 9			[NI-160]				
	Plant fossils and occasional stigmaria.				r = 50	11·95						
	20mm of soft grey clay		12·40	119·20		12·15	S S	(52 for 75mm)				
Grey thinly and medium bedded, slightly weathered SILTSTONE, moderately weak with horizons of frequent light grey sandstone partings.	Sub vertical irregular rough joint.				t = 98							
	Occasional ironstone bands.				s = 50							
	Inclined planar smooth fracture 30°		(2·35 pm)		r = 77	13·45		240				
	Dip 5°				t = 100			[90 - 450]				
					s = 91							
	70mm of firm grey clay		14·95	116·65	r = 65	14·95			2/8	2·80	3·00	
[BOREHOLE TERMINATED AT 14·95m]												

KEYS	CORES	SAMPLES / INSITU TESTS	TESTS	NOTES/REMARKS/GROUNDWATER DETAILS.
	Presumed area of core loss.	Undisturbed sample (attempted but not recovered shown dotted)	P pH and sulphates Q Quick undrained triaxial CO Consolidation PSD Partical size distribution UCS Unconfined comp. strength LP Liquid/Plastic limits CBR California	
t	Total recovery %	B Bulk disturbed		
s	Solid recovery %	D Small disturbed		
r	R.Q.D. %	W Water		
If	Fracture spacing (mm)	C or S - SPT cone or spoon (25) - N value		
3·8	Depth groundwater struck (m) and depth			

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Building Standards Department.
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GEOTECHNICAL SERVICES

CLIENT :- DEPARTMENT OF TRANSPORT
ENGINEER :- SIR OWEN WILLIAMS & PARTNERS

SITE :- BIRDWELL QUARRY FOOTBRIDGE

BOREHOLE No. 3
SHEET 1 of 2

DRILLING METHODS :- Rotary open hole and coring using air/mist flush, producing 87mm. dia. core in rigid liner.

GROUND LEVEL :- 131·00m. A.O.D.

COORDINATES :- E N

DATE :- 3-5/8/93

SCALE :- 1:50

MAIN DESCRIPTION	DETAILS	Legend	Depth	Reduced Level	Coring Details	Samples / Insitu Tests: Depth (m)	Type No.	Test Result	Date	Casing Depth (m)	Water Depth (m)	SI pipe/ Piezo
Dark brown loamy TOPSOIL with rootlets.			0·30 (0·30)	130·70								
Cobbles and boulders of sandstone (MADE GROUND)			0·70									
Grey silty MUDSTONE			(0·65)			1·00	1 S	(107 for 225mm)				
			1·35	129·65		1·35		If	3/8		Dry	
Brown fine to medium SANDSTONE moderately strong.	Sub vertical planar joint.		1·45	129·55				Gen NI	4/8		Dry	
Dark grey, moderately weathered, sandy muddy slightly micaceous SILTSTONE very weak.	Generally fractured irregular ironstained joint.		(0·35)		t = 100							
	Vertical irregular ironstained joint.		1·80	129·20	s = 7							
Orange brown, thinly and medium bedded, slightly weathered fine to medium slightly micaceous SANDSTONE, moderately strong.	Occasional coal partings.		(0·90)		r = 50			100–320				
	Steeply inclined planar ironstained joint.		2·70	128·30		2·60					2·60	
Light grey, thinly and medium bedded slightly weathered, slightly micaceous fine to medium SANDSTONE, moderately strong with inclusions of gravel and occasionally cobble sized fragments of grey siltstone.	Occasional penetratively ironstained bedding planes some with increased weathering and reduction in strength of surrounding rock to weak and moderately weak.		(1·60)		t = 100							
					s = 47			120 (NI – 170)				
	Occasional steeply inclined irregular ironstained jointing.				r = 48	4·10	W					
			4·30	126·70		4·10	2 S	(50 for 65mm)		1·00		
Black Cannel COAL, moderately strong with traces of pyritised mussels.	Laminated carbonaceous mudstone		(0·35)		t = 96	4·25		NI				
			4·65	126·35				NI				
	Interlocking fragments in part altered to firm clay (40%)				s = 27							
					r = 0.			40 (10 – 90)				
		P				5·60						
						5·70	3 S	(80 for 150mm)				
Grey very thinly and thinly bedded moderately and slightly weathered MUDSTONE, very weak and weak with occasional ironstone bands.					t = 100			NI				
	Very closely spaced sub vertical and steeply inclined planar intersecting joints.	P			s = 0			NI (NI – 80)				
		P										
			(4·65)		r = 0			NI				
	Highly weathered and fragmented					7·10						
	Occasional plant fossils.	P			t = 92			40 (NI – 100)				
		P			s = 20							
					r = 8			NI				
	Interlocking fragments and firm clay 50%					8·30						
						8·45	4 S	(50 for 50mm				
	Very closely and closely spaced sub vertical and steeply inclined planar smooth jointing.	P			t = 100			60 (NI – 120)				
Black thickly laminated, slightly weathered carbonaceous MUDSTONE moderately weak with mussels.					s = 22							
			9·30	121·70								
Black bright cleated COAL	Very closely spaced jointing. Dip		9·45	121·55				NI				
Light grey and dark grey firm CLAY (SEATEARTH)			(0·35)		r = 9							
			9·80	121·20		9·85						
SILTSTONE (see following sheet)			9·90	121·10								

KEYS

CORES

- Presumed area of core loss.
- t Total recovery %
- s Solid recovery %
- r R.Q.D. %
- If Fracture spacing (mm)
- Depth groundwater struck (m) and depth

SAMPLES / INSITU TESTS

- Undisturbed sample (attempted but not recovered shown dotted)
- B Bulk disturbed
- D Small disturbed
- W Water
- C or S – SPT cone or spoon (25) – N value

TESTS

- P pH and sulphates
- Q Quick undrained triaxial
- CO Consolidation
- PSD Partical size distribution
- UCS Unconfined comp. strength
- LP Liquid/Plastic limits
- CBR California

NOTES/REMARKS/GROUNDWATER DETAILS.

NI = Non Intact

http://scans.bgs.ac.uk/sobi_scans/boreholes/15624566/images/15028273.png

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Building Standards Department.
Town Hall
SHEFFIELD S1 2HH.

GEOTECHNICAL SERVICES

CLIENT :- DEPARTMENT OF TRANSPORT
ENGINEER :- SIR OWEN WILLIAMS & PARTNERS

SITE :- BIRDWELL QUARRY FOOTBRIDGE

BOREHOLE No. 3
SHEET 2 of 2

DRILLING METHODS :- As sheet 1

GROUND LEVEL :- 131·00m. A.O.D.

COORDINATES :- E N

DATE :- 3-5/8/93

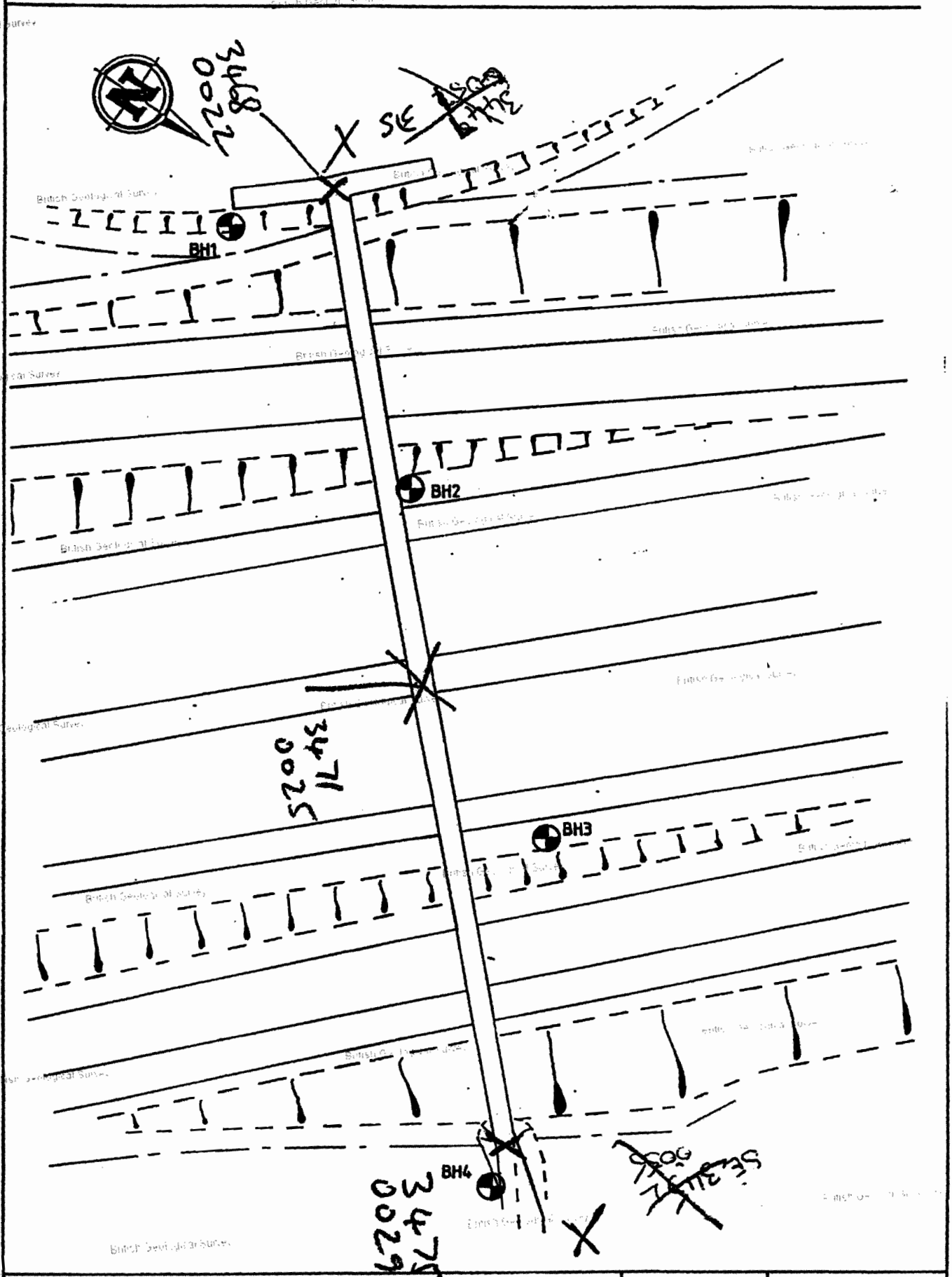
SCALE :- 1:50

MAIN DESCRIPTION	DETAILS	Legend	Depth	Reduced Level	Coring Details	Samples / Insitu Tests: Depth (m)	Type No.	Test Result	Date	Casing Depth (m)	Water Depth (m)	St'pipe/ Piezo
Light grey and grey, medium bedded, fresh SILTSTONE, and fine SANDSTONE, moderately weak and moderately strong with occasional ironstone bands and small nodules.	Sub vertical irregular joint. Insitu plant fossils grey siltstone laminae display small scale cross bedding. Vertical discontinuous planar calcite infilled fracture.		(1·50)		t = 97 s = 83 r = 90	11·35 11·50	S ‡ S	250 (60-330)				
Grey thinly bedded slightly weathered silty MUDSTONE, weak with occasional ironstone bands.	Occasional plant fossil fragments. Reduction in silt content with depth Vertical and steeply inclined planar smooth joints. Closely spaced steeply inclined planar joints.		11·40 (2·00)	119·60	t = 100 s = 50 r = 69 t = 100	12·90		(50 for 40mm) 140 (NI - 180)				GROUT
Grey, very thinly and thinly bedded slightly weathered MUDSTONE, weak with occasional ironstone bands.	Increased weathering and fracturing adjacent to ironstone bands. Occasional sub vertical planar smooth joints		13·40 (1·00 est) 14·40	117·60 116·60	s = 47 r = 24	14·40		70 (NI - 120)	4/8	1·00	5·00	
[BOREHOLE TERMINATED AT 14·40m]												

KEYS	CORES	SAMPLES / INSITU TESTS	TESTS	NOTES/REMARKS/GROUNDWATER DETAILS.
	Presumed area of core loss.	Undisturbed sample (attempted but not recovered shown dotted)	P pH and sulphates Q Quick undrained triaxial CO Consolidation PSD Partical size distribution UCS Unconfined comp. strength LP Liquid/Plastic limits	
t	Total recovery %	B Bulk disturbed		
s	Solid recovery %	D Small disturbed		
r	R.Q.D. %	W Water		
If	Fracture spacing (mm)	C or S - SPT cone or spoon		
3-8	Depth groundwater struck (m) and depth			

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GEOTECHNICAL SERVICES



Report.	Borehole Location Plan BIRDWELL QUARRY FOOTBRIDGE	Scale:- 1:500	Fig.No. 2

British Geological Survey

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Building Standards Department.
Town Hall
SHEFFIELD S1 2HH.

GEOTECHNICAL SERVICES

CLIENT :- DEPARTMENT OF TRANSPORT
ENGINEER :- SIR OWEN WILLIAMS & PARTNERS

SITE :- BIRDWELL QUARRY FOOTBRIDGE

BOREHOLE No. 4
SHEET 1 of 2

DRILLING METHODS :- Rotary open hole and coring using air / mist flush, producing 87mm. dia. core in rigid liner.

GROUND LEVEL :- 136.70m. A.O.D.

COORDINATES :- E N

DATE :- 27-28/7/93

SCALE :- 1:50

MAIN DESCRIPTION	DETAILS	Legend	Depth	Reduced Level	Coring Details	Samples / Insitu Tests: Depth (m)	Type No.	Test Result	Date	Casing Depth (m)	Water Depth (m)	SI'pipe/ Piezo
Dark brown sandy TOPSOIL			0.20 (0.30)	136.50								
Pink and buff sand to coarse gravel of limestone (MADE GROUND)			0.50 (1.00)	136.20								
Firm becoming stiff orange brown, buff and grey, mottled clay with fragments of sandstone, limestone coal and ironstone. (MADE GROUND)	Brick fragments at the top.		1.50 (0.80)	135.20	OPEN HOLE	0.50-2.30	2 B					
Stiff/very stiff, grey and brown sandy CLAY with very weak brown sandstone lithorelicts. (Highly weathered SANDSTONE)			2.30 (1.35)	134.40		1.90	1 S	(25)				
Brown moderately weathered fractured SANDSTONE.	Penetratively ironstained		3.65 (13.65 pen)	133.05		3.40	3 S	(80 for 75mm.)		2.80		GROUT
Light grey and orange brown, very thinly to medium bedded slightly weathered fine to medium SANDSTONE, moderately strong and strong.	Penetratively ironstained				t = 100 s = 80 r = 31	3.65						
	Steeply inclined planar rough joint. Sub vertical rough tight joint.				t = 100 s = 62 r = 67	4.40		80 (30-300)				
	2 oppositely inclined planes at 20° & 30° Vertical planar iron-stained joint				t = 100 s = 37	5.90		550				
	Sub vertical planar ironstained joint.				r = 81			350	27/7	2.80	Dry	
	Closely spaced steeply inclined planar iron-stained joints. Sub vertical planar tight joint.				t = 97 s = 50 r = 80	7.40		530	28/7			
	From 8-10m frequent inclusions of gravel and occasional cobble sized fragments of grey siltstone. Dip 10°					8.90		170 (NI - 400)				
	Increased weathering and reduction in strength to weak adjacent to some bedding planes				t = 90 s = 63 r = 53							

KEYS	CORES	SAMPLES / INSITU TESTS	TESTS	NOTES/REMARKS/GROUNDWATER DETAILS.
	Presumed area of core loss.	Undisturbed sample (attempted but not recovered shown dotted)	P pH and sulphates	NI = Non Intact
t	Total recovery %	B Bulk disturbed	Q Quick undrained triaxial	
s	Solid recovery %	D Small disturbed	CO Consolidation	
r	R.Q.D. %	W Water	PSD Partical size distribution	
If	Fracture spacing (mm)	C or S - SPT cone or spoon (25) - N value	UCS Unconfined comp. strength	
3.8	Depth groundwater struck (m) and depth water rose to in %		LP Liquid/Plastic limits	
			CBR California	

CITY OF SHEFFIELD
Building Standards Department.
Town Hall
SHEFFIELD S1 2HH.

GEOTECHNICAL SERVICES

CLIENT :- DEPARTMENT OF TRANSPORT
ENGINEER :- SIR OWEN WILLIAMS & PARTNERS

SITE :- BIRDWELL QUARRY FOOTBRIDGE

BOREHOLE No. 4
SHEET 2 of 2

DRILLING METHODS :- (As sheet 1)

GROUND LEVEL :- 136·70m. A.O.D.

COORDINATES :- E N

DATE :- 27-28/7/93

SCALE :- 1:50

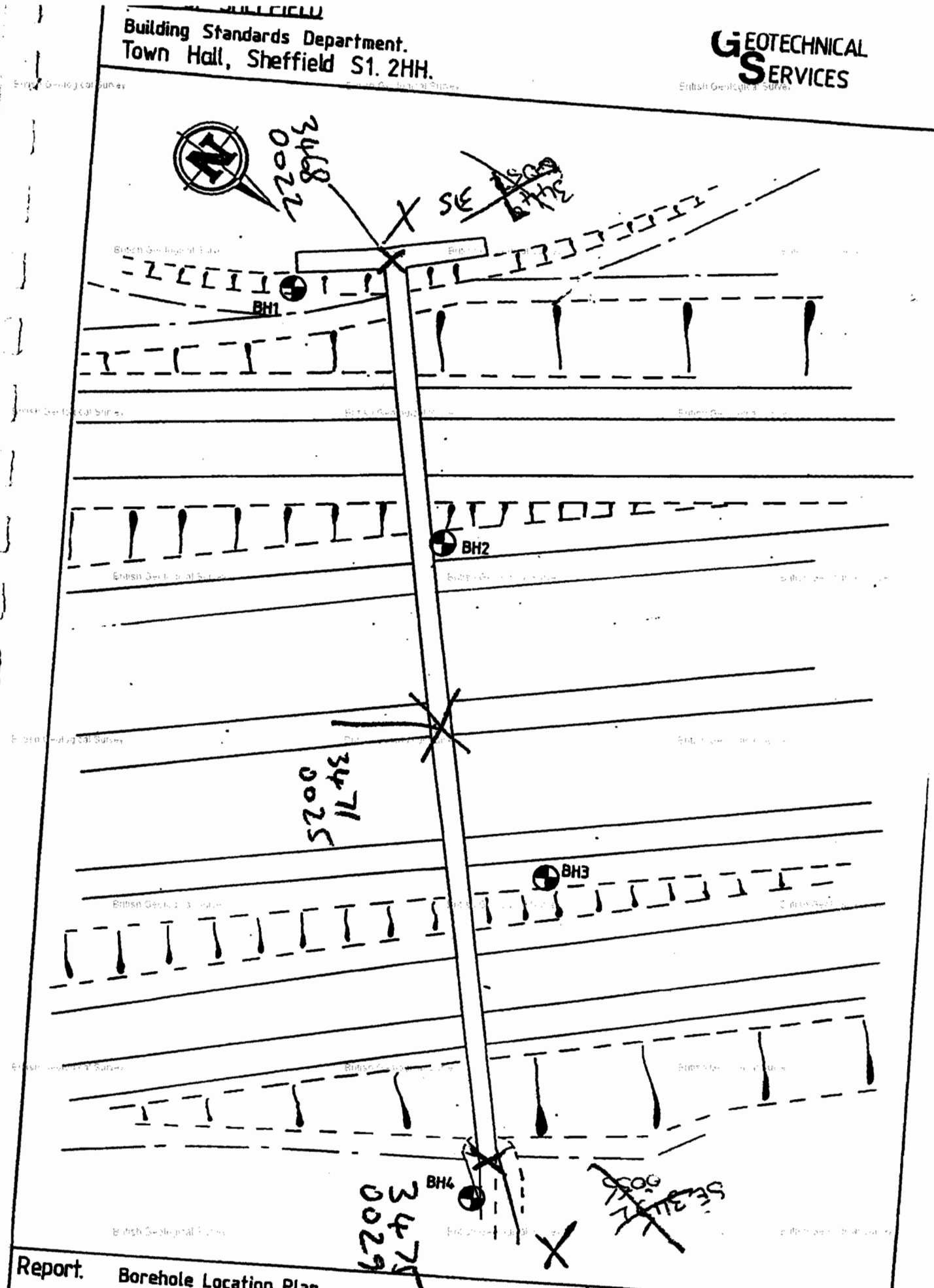
MAIN DESCRIPTION	DETAILS	Legend	Depth	Reduced Level	Coring Details	Samples / Insitu Tests: Depth (m)	Samples / Insitu Tests: Type No.	Samples / Insitu Tests: Test Result	Date	Casing Depth (m)	Water Depth (m)	SI pipe/ Piezo
SANDSTONE (as sheet 1)			10·30	126·40		10·30			28/7	2·80	9·63	GROUT
[BOREHOLE TERMINATED AT 10·30m]												

KEYS	CORES	SAMPLES / INSITU TESTS	TESTS	NOTES/REMARKS/GROUNDWATER DETAILS.
	Presumed area of core loss.	Undisturbed sample (attempted but not recovered shown dotted)	P pH and sulphates Q Quick undrained triaxial	
t	Total recovery %	B Bulk disturbed	CO Consolidation	
s	Solid recovery %	D Small disturbed	PSD Partical size distribution	
r	R.Q.D. %	W Water	UCS Unconfined comp. strength	
If	Fracture spacing (mm)	C or S – SPT cone or spoon (25) – N value	LP Liquid/Plastic limits	
3·8 / x	Depth groundwater struck (m) and depth water rose to in X	* – Penetration for seating blows.	CBR California	

http://scans.bgs.ac.uk/sobi_scans/boreholes/15624567/images/15028276.png

Building Standards Department.
Town Hall, Sheffield S1. 2HH.

GEOTECHNICAL SERVICES



Report. Borehole Location Plan
BIRDWELL QUARRY FOOTBRIDGE

Scale:- 1:500

Fig No. 2

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Site	Borehole Number
South Yorkshire COA NMCS2 Upgrade	M43

Machine: / Flush : / Core Dia: mm / Method :	Casing Diameter	Ground Level (mOD)	Client	Job Number
	122mm cased to 6.80m		Tarmac	F11288A
	Location	**Dates**	**Engineer**	**Sheet**
	434800 E 400218 N	12/04/1999-13/04/1999	WSP Environmental Ltd	1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.20) 0.20	TOPSOIL.		
	98	35	4	0			(0.50) 0.70	Firm brown mottled red brown slightly sandy CLAY with occasional fine to coarse assorted gravel. (Possible Made Ground)		
0.80					12/04/1999:0.00m		0.80	Mudstone bedrock, recovered as fine to coarse subangular gravel sized fragments.		
1.00					13/04/1999: C C16 C2			Dark grey locally stained red brown thinly laminated moderately locally highly weathered MUDSTONE, weak locally moderately weak. Discontinuities: Generally extremely closely spaced ie non intact locally		
1.00	97	66	0	0						
3.30										
	100	80	17	0			(7.20)	—from 4.10m to 4.50m with very thin interlamination of sandstone, moderately weak		
4.80										
	100	89	38	0						
6.30										
	100	96	39	0				—from 6.80m to 8.00m slightly weathered with discontinuities generally closely and very closely spaced —below 7.20m increasingly sandy grading into		
7.80										
	100	78	62	0			8.00	Grey locally mottled dark grey fine grained thinly bedded slightly locally moderately weathered SANDSTONE, strong. Discontinuities generally closely spaced, dipping 0-10? below 9.72 discontinuities med —from 8.00m to 9.35m distinctive dark grey medium and coarse gravel sized elongate and lenicular mudstone inclusions throughout sandstone matrix		
							(2.42)			
9.35										

Remarks
1. Hand dug inspection pit excavated GL to 0.80m. 2. Borehole grouted on completi

Scale (approx)	Logged By
1:50	BS

Figure No.

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Site	Borehole Number
South Yorkshire COA NMCS2 Upgrade	M43

Machine:	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :	122mm cased to 6.80m		Tarmac	F11288A
Core Dia: mm				
Method :	Location	Dates	Engineer	Sheet
	434800 E 400218 N	12/04/1999-13/04/1999	WSP Environmental Ltd	2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
	100	53	0	0			10.42 (0.22) 10.64	Black thinly laminated moderately weathered shaley COAL, weak. Single persistant subvertical to inclined discontinuities 40-60? iron stained.		
10.75							(1.61)	Grey, thinly laminated moderately weathered locally highly and completely weathered MUDSTONE, weak locally moderately weak. Discontinuities generally extremely closely spaced (re non intact) dipping ho		
					13/04/1999:0.00m		12.25	Complete at 12.25m		

Remarks

Scale (approx)	Logged By
1:50	BS

Figure No.

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

SYMAS REPORT

MINERAL REPORT

Date: 16th August 2013

My Ref: PJ/M3687/5

CONFIDENTIAL

BIRDWELL ROUNDABOUT AND LINK ROAD TO ROCKINGHAM ROUNDABOUT.

SITUATION

A mining report has been requested for the proposed new Birdwell roundabout and link road. This report provides a review of the mining and geological history along the proposal and an assessment for the potential for mining legacy risks. The report makes recommendations for investigation and/or remediation requirements.

GEOLOGICAL INFORMATION

Geological records indicate that the land is underlain by Middle Coal Measures mudstones, siltstones and sandstones. A geological fault is conjectured to cross the proposal as shown coloured blue on drawing M3687/5a.
The proposal is also dominated by two areas of opencast backfill as shown on the attached drawing and detailed below.

MINING

Opencast

The Tankersley Common and Rockingham opencast sites were worked during the 1940's and 1990's respectively as marked red on drawing M3687/5a. The opencast voids were subsequently backfilled with overburden/spoil and the land returned to agricultural use/open space. The backfill varies in thickness from less than 2 metres in the west to in excess of 10m in the east. Consequently the proposed roads will cross backfill and opencast high walls.
The Rockingham opencast site was compacted back to provide a developable platform. Creep and/or differential settlement could still occur across high walls or above the Tankersley common site in particular.

Underground (Deep Mining)

This area has been affected by deep mine workings in the past.
However all affects from deep mine workings should have ceased decades ago and with the site now being remote from the active coalfield it should remain stable for the foreseeable future.

FORMER LAND USES

Historical ordnance survey plans show the route crossing open land with no significant development prior to the opencast working of coal.

Tel: (01226)772689
Fax: (01226)772688
E-mail: symas@barnsley.gov.uk
Website: www.barnsley.gov.uk/symas

BARNSLEY Metropolitan Borough Council Doncaster Rotherham

LANDFILL

The current borough landfill register does not indicate the route to cross any landfill although one landfill sites is recorded within 250m of the proposal as detailed below.

Site No.	Landfill Material	Category
53	Demolition waste	4

Category 4 sites are described "as being licensed to accept material that would not be expected to give rise to landfill gas in substantial quantities"

CONCLUSIONS

1. The route is considered stable from the deep mining subsidence aspect and as it now lies remote from the active coalfield it is likely to remain in this state for the foreseeable future.

2. The Tankersley Common opencast backfill was not compacted to provide a developable platform. Although backfilled over 50 years ago the possibility for creep or differential settlement remains. It would therefore be prudent to undertake near surface soils investigations to adequately assess the ground conditions and compaction over the backfill. The road foundations should be suitably designed particularly across the high walls to prevent damage due to differential settlement.

3. Given the extent of opencast the chances of encountering unworked coal at surface is low. Any coal encountered in foundation excavations should be blinded off with a suitable inert material to reduce the risk of spontaneous combustion occurring. SYMAS can be called upon for on-site inspection if any unusual ground conditions are encountered.

4. Fugitive gases may be present within the opencast fill or landfill. Fugitive gas monitoring and safety procedures should therefore be undertaken where site personnel are required to work in deep or confined excavations.

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Report prepared by P. James 16th August, 2013.



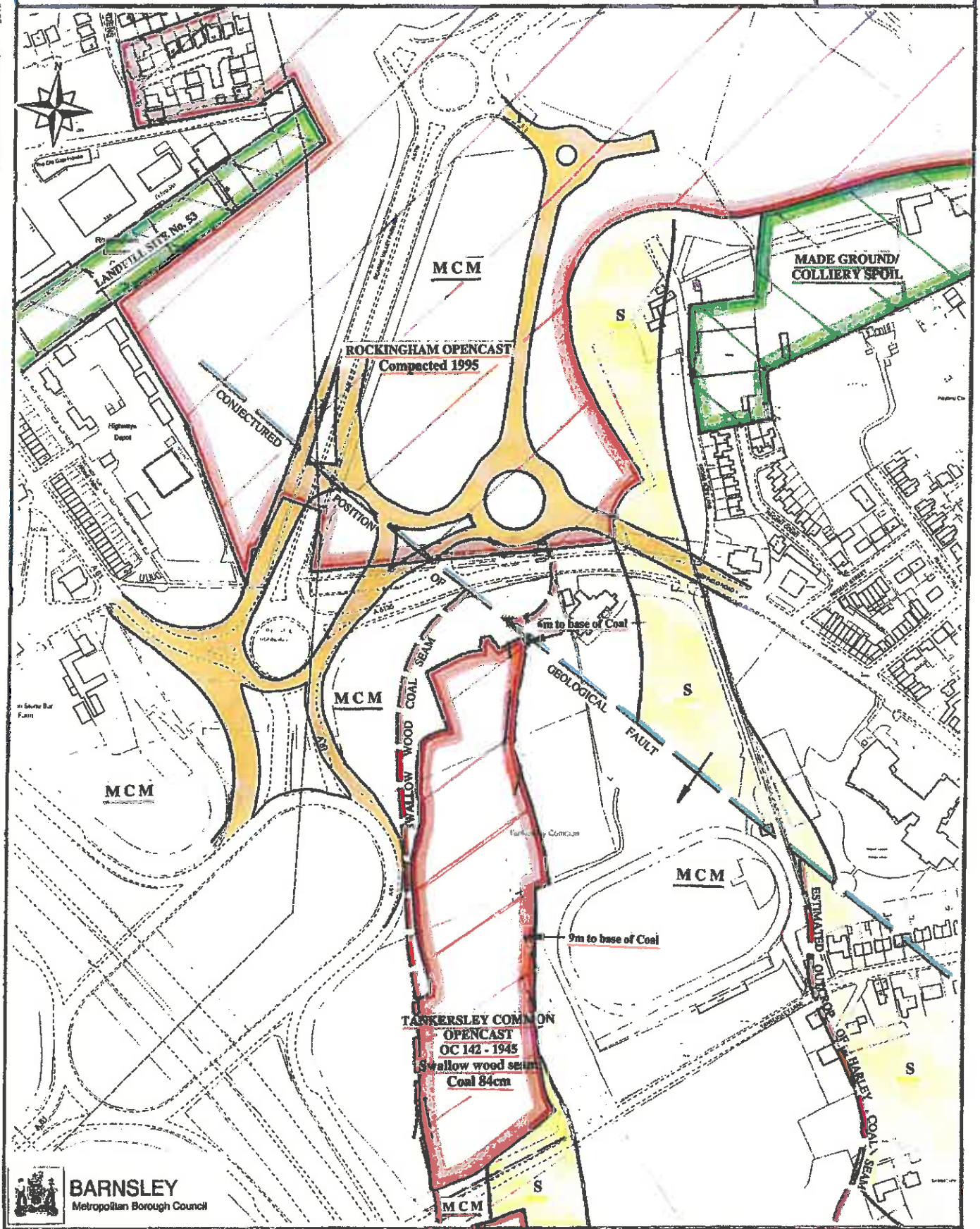
P. James,
Principal Mining Engineer.

DRAWING TITLE

BIRDWELL ROUNDABOUT & LINK ROAD TO ROCKINGHAM ROUNDABOUT

DRAWING NO.

M3687/5A



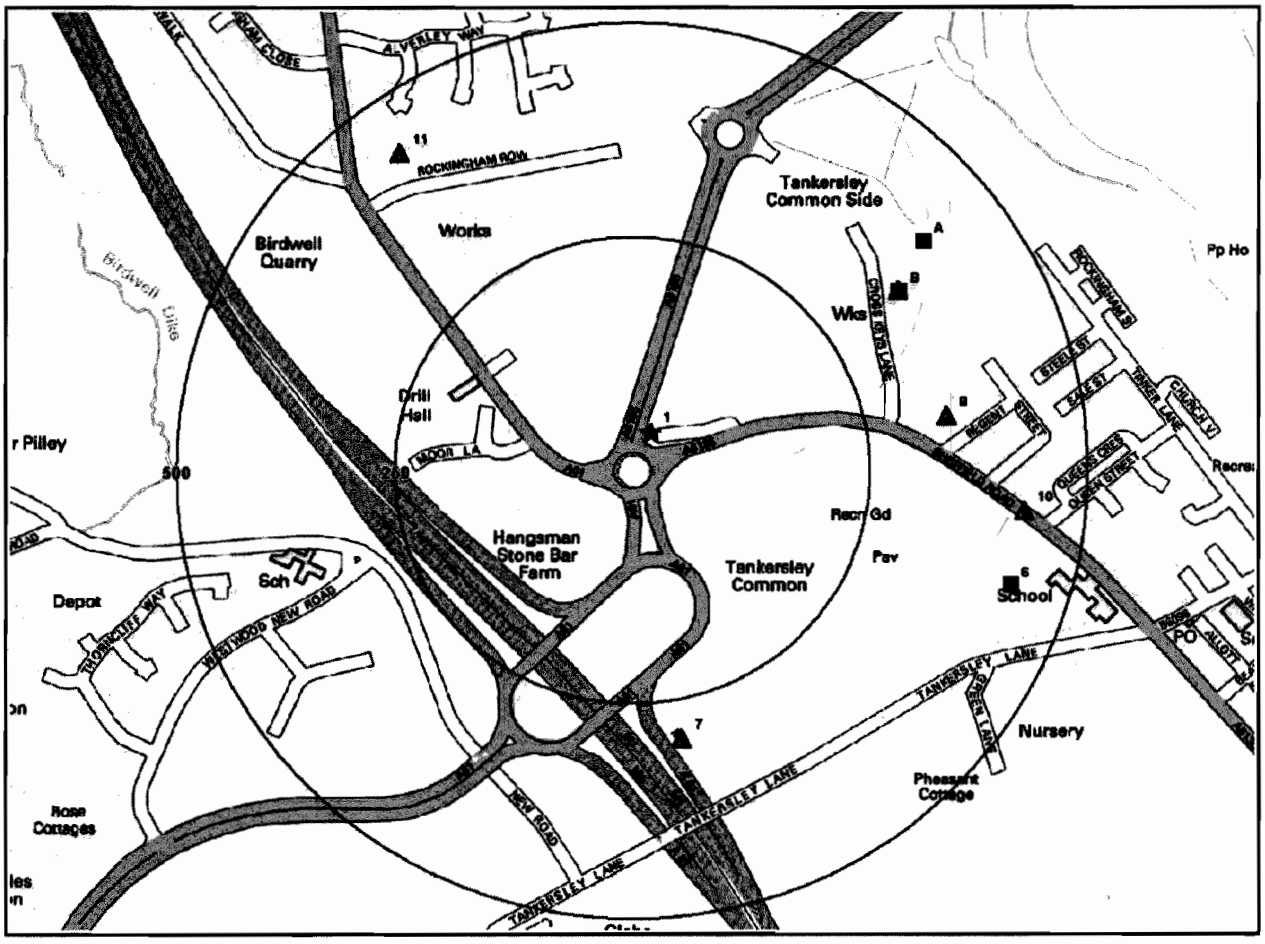
BARNSLEY
Metropolitan Borough Council

SCALE	DATE		O.S REFERENCE
1:2500	12.8.13	SOUTH YORKSHIRE MINING	SE 3400/3500
DRAWN BY: AS	CHECKED BY:	ADVISORY SERVICE	P. JAMES BSc (Hons) PRINCIPAL MINING ENGINEER

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GROUNDSURE ENVIROINSIGHT REPORT

1. Environmental Permits, Incidents and Registers Map



Authorisations,Incidents and Registers Legend

Mapping sourced from Ordnance Survey

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- Site Outline
- Search Buffers (m) — 250 — 500
- ★ Recorded Pollution Incident
- ◆ Dangerous Substances (List 1)
- ◇ Dangerous Substances (List 2)
- ◪ Water Industry Referrals
- ■ Licenced Discharge Consents
- □ Red List Discharge Consents
- ▼ RAS 3 & 4 Authorisations
- ▲ Part A(1) Authorised Processes and Historic IPC Authorisations
- ▲ Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

1.Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

Records of historic IPC Authorisations within 500m of the study site: **0**

Database searched and no data found.

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: **0**

Database searched and no data found.

Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: **0**

Database searched and no data found.

Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: **0**

Database searched and no data found.

Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: **0**

Database searched and no data found.

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: **0**

Database searched and no data found.

Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: **5**

The following Part A(2) and Part B Activities are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
7	297.0	S	435023, 400019	Address: Save Serv Stn Sheffield Rd, Hoyland Common,barnsley, S74 0DP Process: Petrol Vapour Recovery Process Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

8	343.0	E	435327, 400395	Address: Cross Keys Garage (barnsley) Ltd, Sheffield Road, Hoyland Common, Barnsley, S74 0PY Process: Petrol Vapour Recovery Process Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
9B	346.0	NE	435271, 400541	Address: G B Trucks Ltd, Cross Keys Lane, Hoyland, Barnsley, S74 0QA Process: Vehicle Re-spray Process Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
10	429.0	E	435416, 400284	Address: British Coal Corporation, Sheffield Road, Hoyland, Barnsley, S74 1DQ Process: Coal, Coke And Coal Products Process Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
11	432.0	NW	434700, 400700	Address: Hartwood Exports(machinery)ltd Hangmanstone Depot, Sheffield Rd,birdwell,S70 5TR Process: Waste Oil Burning Process Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: **0**

Database searched and no data found.

Records of Licensed Discharge Consents within 500m of the study site: **5**

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
2B	348.0	NE	435272, 400542	Address: G.b. Trucks Services Ltd, Cross Keys Works, Cross Keys Lane, Hoyland Land, Barnsley, S74 0QA Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: S/P/1181 Permit Version: 1	Receiving Water: Short Wood Dike Status: Undetermined 1961 Application Issue date: 19/5/1963 Effective Date: 19/5/1963 Revocation Date: -
3A	405.0	NE	435300, 400600	Address: Cross Key Lane Works, Hoyland Common, Barnsley Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit Permit Number: WRA7281 Permit Version: 1	Receiving Water: Short Wood Dyke Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 28/1/1997 Effective Date: 28/1/1997 Revocation Date: -
4A	405.0	NE	435300, 400600	Address: Cross Key Lane Works, Hoyland Common, Barnsley Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit Permit Number: C5082 Permit Version: 1	Receiving Water: Trib Of Shortbridge Dyke Status: Transferred From Copa 1974 Issue date: 13/5/1988 Effective Date: 13/5/1988 Revocation Date: 20/6/1994
5A	405.0	NE	435300, 400600	Address: Cross Key Lane Works, Hoyland Common, Barnsley Effluent Type: Trade Discharges - Site Drainage (contam Surface Water, Not Waste Sit Permit Number: C5082 Permit Version: 2	Receiving Water: Trib Of Shortbridge Dyke Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 21/6/1994 Effective Date: 21/6/1994 Revocation Date: 1/10/1996
6	430.0	E	435400, 400200	Address: Valley Farm, Hutton Bonville, Northallerton, North Yorkshire Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: WA 5000 Permit Version: 1	Receiving Water: River Wiske Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 9/8/1996 Effective Date: 9/8/1996 Revocation Date: -

Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: **0**

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: **0**

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: **1**

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
1	26.0	NE	434987, 400377	Incident Date: 22/03/2003 Incident Identification: 145104 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

Records of National Incidents Recording System, List 1 within 250m of the study site: **0**

Database searched and no data found.

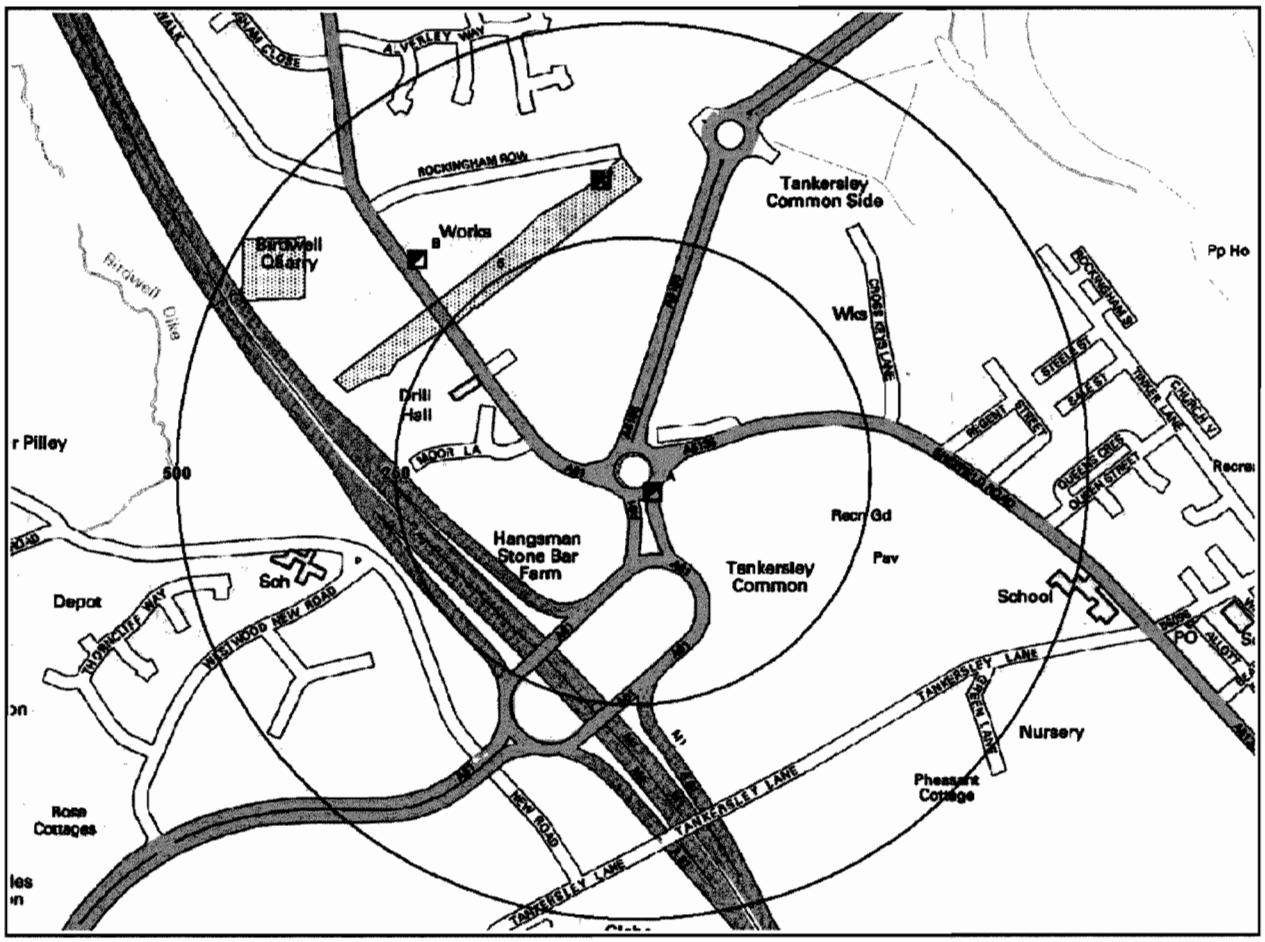
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? **0**

Database searched and no data found.

2. Landfill and Other Waste Sites Map

NW N NE



W E

SW S SE

Landfill & Other Waste Sites Legend

Mapping sourced from Ordnance Survey

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- Site Outline
- Search Buffers (m) — 250 — 500
- E.A. Active Landfill
- E.A. Historic Landfill (Area Data)
- E.A. Historic Landfill (Point Data)
- BGS / DoE Survey Landfill
- Local Authority Landfill (Area Data)
- Local Authority Landfill (Point Data)
- Operational Waste Treatment Licence
- Closed Waste Treatment Licence
- REGIS Waste Licence
- Operational Landfill
- Closed Landfill

2. Landfill and Other Waste Sites

2.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site: **0**

Database searched and no data found.

Records of operational landfill sites sourced from Landmark within 1000m of the study site: **0**

Database searched and no data found.

Records of Environment Agency historic landfill sites within 1500m of the study site: **3**

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details	
5	238.0	NW	434800, 400500	Site Address: British Rail Railway Cutting, Adjoining premises of Hartwood Exports (Machinery) Limited, Sheffield Road, Birdwell, Barnsley Waste Licence: Yes Site Reference: WD20 B378, 4400/B378, 20B378(53), (36)B, 4400/(36), 4400/0439 Waste Type: Inert, Commercial Regis Reference: -	Licence Issue: 09-May-1983 Licence Surrendered: 21-Jan-1992 Licence Hold Address: - Operator: Hartwood Exports Machinery Limited
6	404.0	NW	434500, 400500	Site Address: Birdwell Common Quarry, Birdwell, Barnsley, South Yorkshire Waste Licence: - Site Reference: WD20 D928, 4400/(153) Waste Type: - Regis Reference: -	Licence Issue: Licence Surrendered: Licence Hold Address: Templeborough House, Mill Close, Rotherham Operator: -
Not shown	1451.0	NE	435700, 401600	Site Address: Shortwood, Upper Hoyland Road, Hoyland, Barnsley Waste Licence: Yes Site Reference: 20B76(21), 4400/B76, WD20 B76 Waste Type: Inert, Industrial Regis Reference: -	Licence Issue: 03-Oct-1979 Licence Surrendered: 21-Feb-1992 Licence Hold Address: Shortwood, Hoyland, Barnsley Operator: Hoyland Marshall Limited

---

Records of non-operational landfill sites sourced from Landmark within 1000m of the study site: **0**

Database searched and no data found.

Records of BGS/DoE non-operational landfill sites within 1500m of the study site: **0**

Database searched and no data found.

Records of Local Authority landfill sites within 1500m of the study site: **0**

Database searched and no data found.

2.2 Other Waste Sites

Records of operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Database searched and no data found.

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: 1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details	
4	318.0	N	434930, 400670	Site Address: Unit 12 Rockingham Road, Birdwell, BARNSLEY, South Yorkshire, S70 5TU Landfill Licence: 37ABEHAL EA Reference: - Waste Type: Difficult Waste Description: Difficult Known Restrictions: No known restriction on source of waste	Record Date:01-Dec-1993 Transfer Date: Modification Date: Status: Site now exempt from licencing Category: TRANSFER Regulator: EA - North East Region - Ridings Area (Rotherham) Size: Large (< 250,000 tonnes/year)

Records of Environment Agency licensed waste sites within 1500m of the study site: 4

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details	
8A	11.0	SE	434990, 400309	Site Address: Lidget Garage, Sheffield Road, Hoyland Common, Barnsley, S74 0EB Type: - Size: < 25000 tonnes Regis Licence Number: 000077 EPR reference: - Operator: Richard Adrian Goodwin Waste Management licence No: 65291 Annual Tonnage: 0.0	Issue Date: 05/04/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Lidget Garage Correspondence Address: -, Lidget Garage, Sheffield Road, Hoyland Common, Barnsley, S74 0EB
9A	11.0	SE	434990, 400309	Site Address: Lidget Garage, Sheffield Road, Hoyland Common, Barnsley, South Yorkshire, S74 0EB Type: Physico-Chemical Treatment Facility Size: < 25000 tonnes Regis Licence Number: 000077 EPR reference: EA/EPR/GP3892ZW/A001 Operator: Richard Adrian Goodwin Waste Management licence No: 65291 Annual Tonnage: 50000.0	Issue Date: 05/04/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Lidget Garage Correspondence Address: -, -
10B	328.0	NW	434720, 400580	Site Address: Hangmanstone Depot, Sheffield Road, Birdwell, Barnsley, S Yorks, S70 5TR Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: HAR002 EPR reference: - Operator: Hartwood Exports Machinery Ltd Waste Management licence No: 60553 Annual Tonnage: 0.0	Issue Date: 22/11/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Hartwood Exports Correspondence Address: -, Hangmanstone Depot, Sheffield Road, Birdwell, Barnsley, S Yorks, S70 5TR

11B	328.0	NW	434720, 400580	Site Address: Hangmanstone Depot, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TR Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: HAR120 EPR reference: EA/EPR/CP3695LB/S003 Operator: Hartwood Estates Ltd Waste Management licence No: 60553 Annual Tonnage: 0.0	Issue Date: 22/11/1996 Effective Date: 30/01/2008 Modified: - Surrendered Date: 16/02/2009 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Hartwood Exports Correspondence Address: -, -

EA MAPS / SEARCHES

Environment Agency

Enter a postcode or place name: Go

Other topics for this area... River Basin Management Plans - Rivers

Water Framework Directive - River Basin Management Plans - Rivers

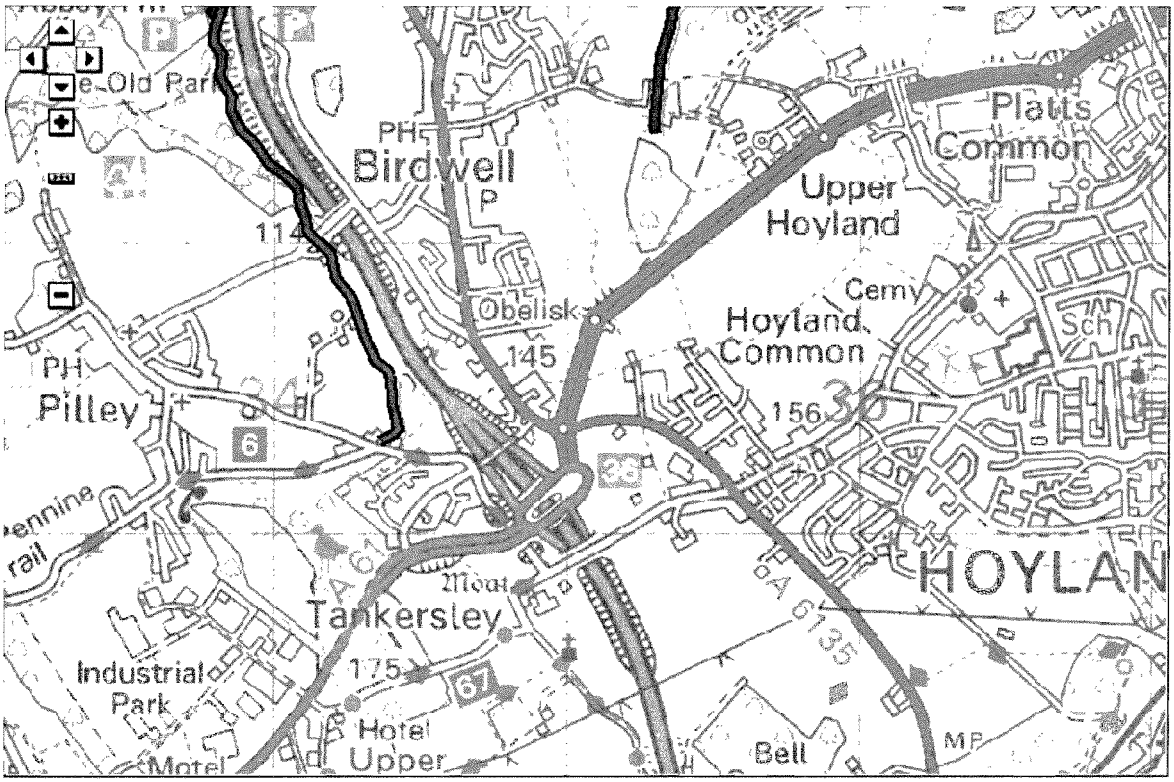
Map of X: 435,069.61; Y: 400,490.39 at scale 1:20,000

Data search Text only version

Map legend

Click on a feature for details of that site

- Current Ecological Quality
  - High
  - Good
  - Moderate
  - Poor
  - Bad
  - Not yet assessed
- Current Chemical Quality
  - Good
  - Fail
  - Does not require assessment
- 2015 Predicted Ecological Quality
  - High
  - Good
  - Moderate
  - Poor
  - Bad
  - Not yet assessed
- 2015 Predicted Chemical Quality
  - Good
  - Fail
  - Does not require assessment
- Monitoring Points
  - Previous Biology
  - Previous Chemistry
  - Previous Fish
  - Previous Groundwater
  - Future Biology
  - Future Chemistry
  - Continuous Flow
- WFD Management Catchments
  - Catchment
- River Basin Districts



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See also:

River Basin Management Plans

View the plans for all river basin districts in England and Wales.

More information

About the Water Framework Directive and River Basin Management Planning.

Environment Agency

Enter a postcode or place name: Go

Other topics for this area... River Basin Management Plans - Rivers

Water Framework Directive - River Basin Management Plans - Rivers

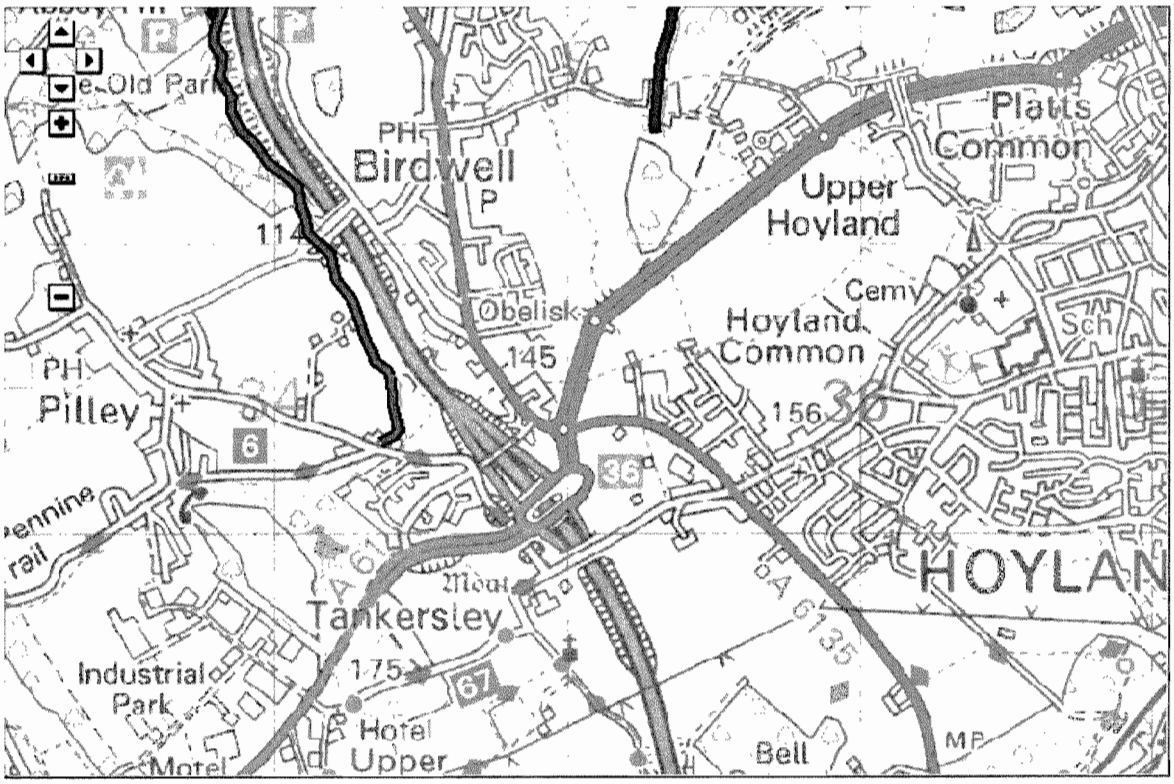
Map of X: 435,069.61; Y: 400,490.39 at scale 1:20,000

Data search Text only version

Map legend

Click on a feature for details of that site

- Current Ecological Quality
  - High
  - Good
  - Moderate
  - Poor
  - Bad
  - Not yet assessed
- Current Chemical Quality
  - Good
  - Fail
  - Does not require assessment
- 2015 Predicted Ecological Quality
  - High
  - Good
  - Moderate
  - Poor
  - Bad
  - Not yet assessed
- 2015 Predicted Chemical Quality
  - Good
  - Fail
  - Does not require assessment
- Monitoring Points
  - Previous Biology
  - Previous Chemistry
  - Previous Fish
  - Previous Groundwater
  - Future Biology
  - Future Chemistry
  - Continuous Flow
- WFD Management Catchments
  - Catchment
- River Basin Districts



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See also:

River Basin Management Plans

View the plans for all river basin districts in England and Wales.

More information

About the Water Framework Directive and River Basin Management Planning.

Environment Agency

Enter a postcode or place name: Go

Other topics for this area... River Basin Management Plans - Rivers

Water Framework Directive - River Basin Management Plans - Rivers

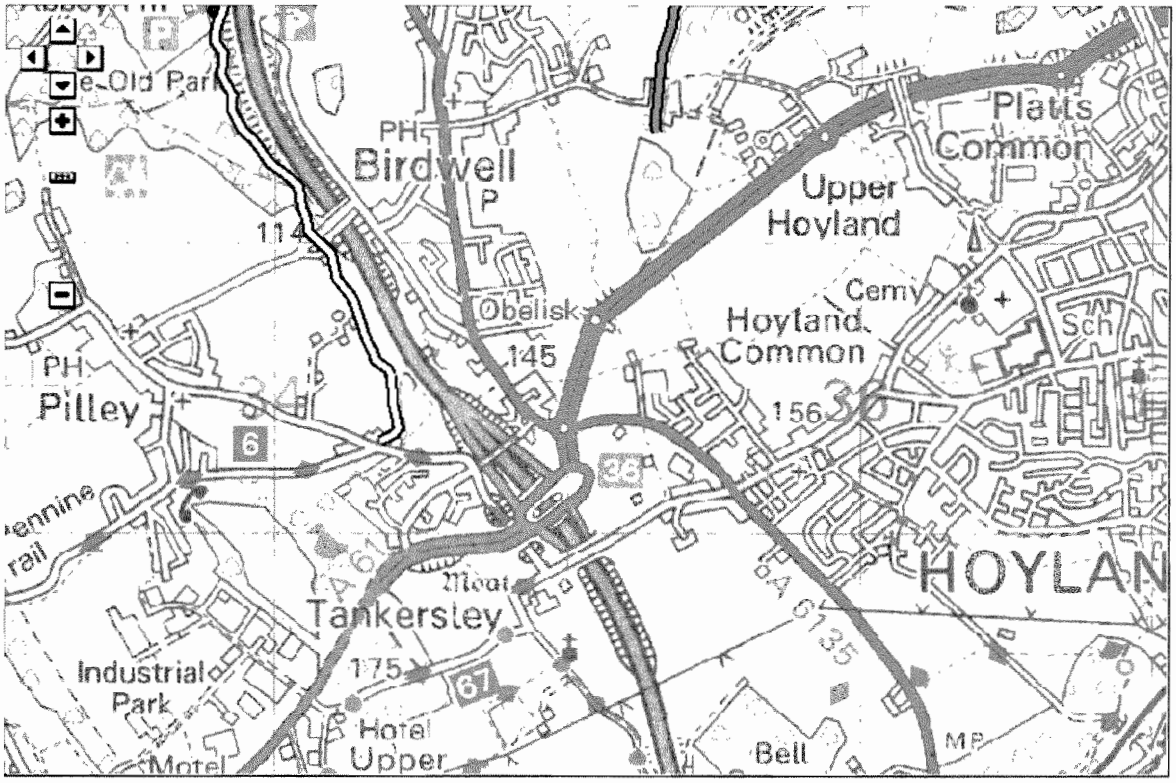
Map of X: 435,069.61; Y: 400,490.39 at scale 1:20,000

Data search Text only version

Map legend

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- Current Ecological Quality
  - High
  - Good
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  - Poor
  - Bad
  - Not yet assessed
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  - Good
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Other topics for this area... River Basin Management Plans - Rivers

Water Framework Directive - River Basin Management Plans - Rivers

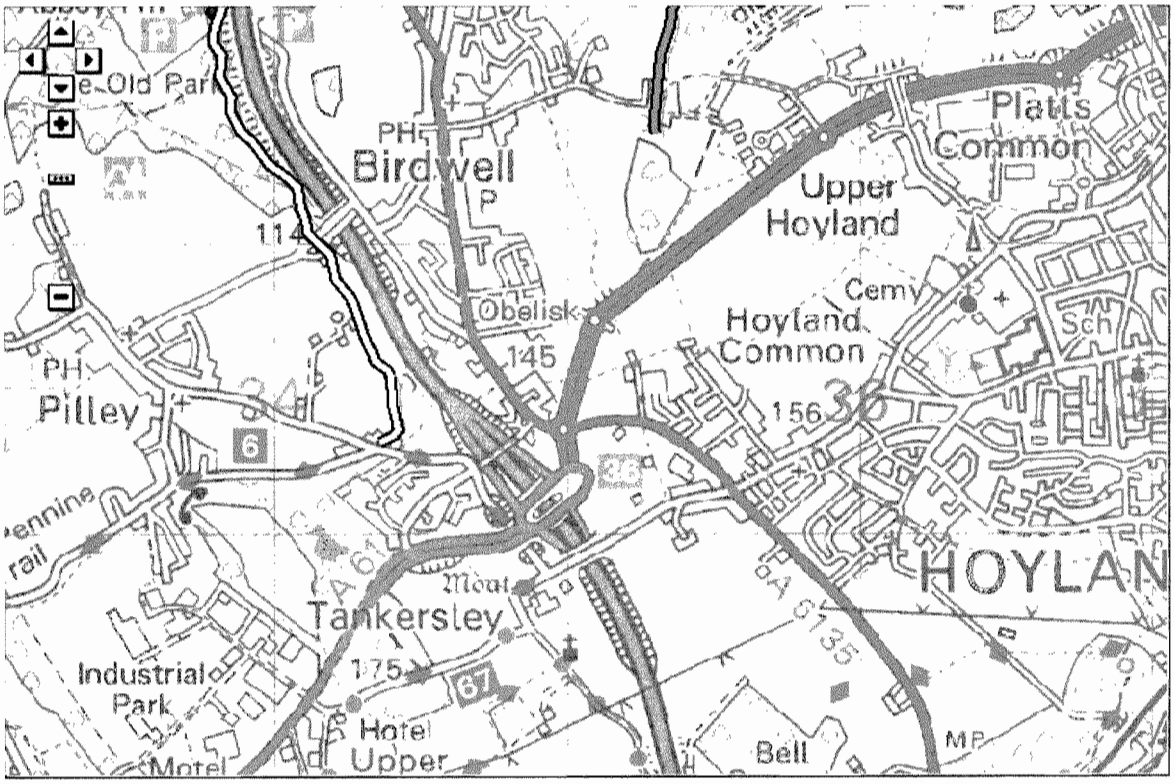
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Data search Text only version

Map legend

Click on a feature for details of that site

- Current Ecological Quality
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  - Poor
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  - Not yet assessed
- Current Chemical Quality
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- River Basin Districts



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View the plans for all river basin districts in England and Wales.

More information

About the Water Framework Directive and River Basin Management Planning.

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Enter a postcode or place name: Other topics for this area... Waste

Go Landfill

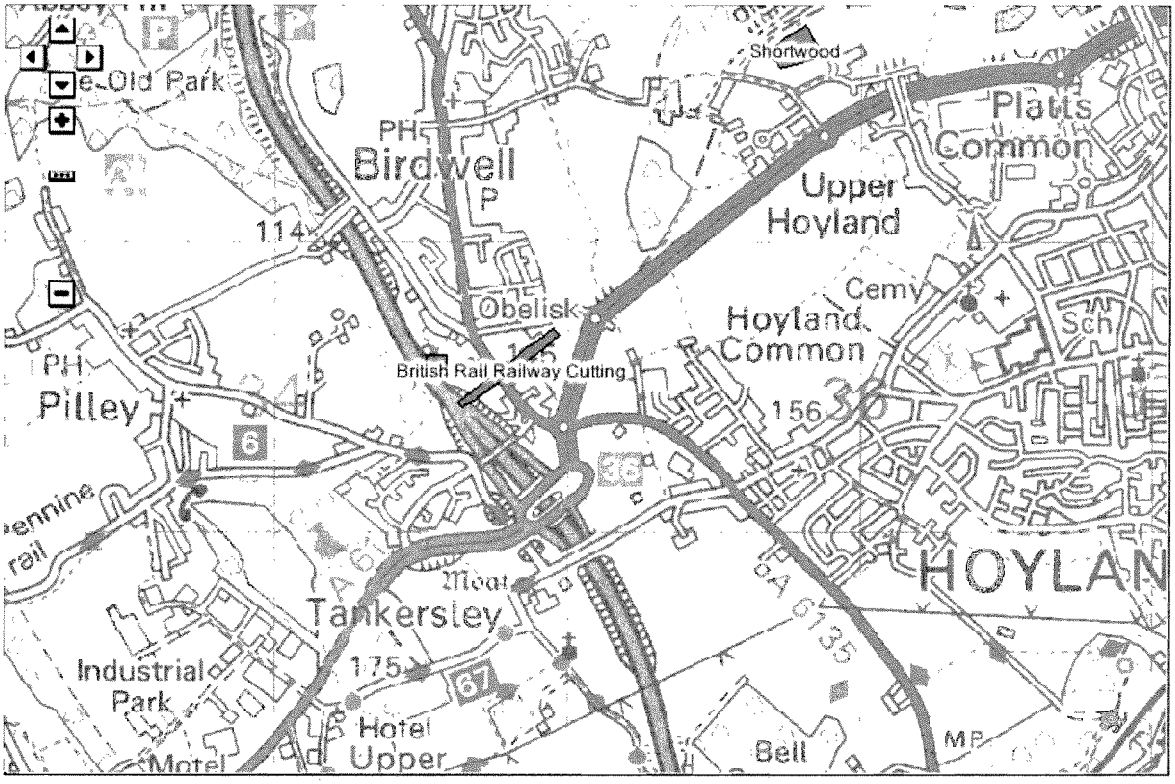
Map legend

Click on a feature for details of that site

- Authorised Landfill
- Site boundary
- Historic landfill
- Site boundary

Map of X: 435,069.61; Y: 400,490.39 at scale 1:20,000

Data search Text only version



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Tell me more about waste and landfill:

Waste regulation

We regulate waste management through a system of licences. Find out how to get the correct licence here, get data on waste and find out if there are any rules applying to household waste.

Waste facts and figures

The UK produces about 220 million tonnes of controlled wastes per year. Find out about waste incineration, hazardous waste, recycling and landfill.

creating a better place

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Environment Agency

Interactive Maps

Historic landfill

Site details	
Site name	British Rail Railway Cutting
Site address	Adjoining premises of Hartwood Exports (Machinery) Limited, Sheffield Road, Birdwell, Barnsley
Site operator	Hartwood Exports Machinery Limited
Licence no.	null

Types of waste buried:	
A 'Yes' is shown in the right hand box where there is evidence that the type of waste may have been buried. If there is no evidence or no data currently available, then the box is left blank.	
Inert: Waste which remains largely unaltered once buried such as glass, concrete, bricks, tiles, soil and stones.	Yes
Commercial: Waste from premises used wholly or mainly for trade, business, sport, recreation or entertainment. Excludes household and industrial waste.	Yes

View map of this location

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Author: The Environment Agency | enquiries@environment-agency.gov.uk
Last updated: 08th August 2013

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Enter a postcode or place name: Go

Other topics for this area... Pollution

Pollution

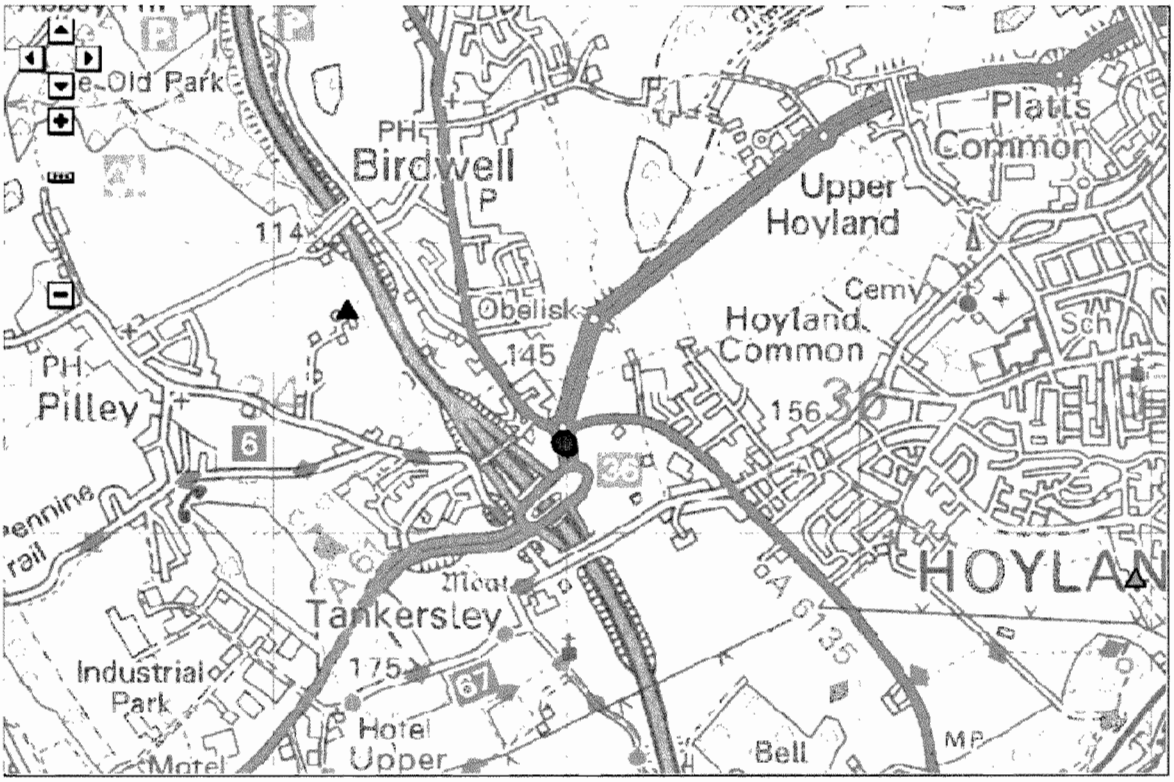
Map legend

Click on a feature for details of that site

- Pollution Incidents
  - Major
  - Significant
- Industrial Pollution
  - Fuel & Power
  - Metal
  - Mineral
  - Chemical
  - Waste
  - Water
  - Radioactive
  - Associated
  - Other
  - Not Classified
- Industrial Operator Scores (OPRA) 2011
  - Band A
  - Band B
  - Band C
  - Band D
  - Band E
  - Band F
- Compliance Rating Scores
  - Very Good
  - Good
  - Moderate
  - Fair
  - Poor
  - Bad
- Mining Waste
  - Closed Mining Waste Sites
- Historic Industrial Operator Scores (OPRA)
  - Permitted Sites

Map of X: 435,070; Y: 400,490 at scale 1:20,000

Data search Text only version



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Tell me more about Pollution:

Pollution Incidents

Find out how we categorise incidents and their possible effects on health and the environment

Industrial Pollution

Every industrial process could theoretically pose a risk to human health and the environment. Find out how we measure this risk and how we score operators on their potential to impact the environment.

Industrial Operator Scores (OPRA)

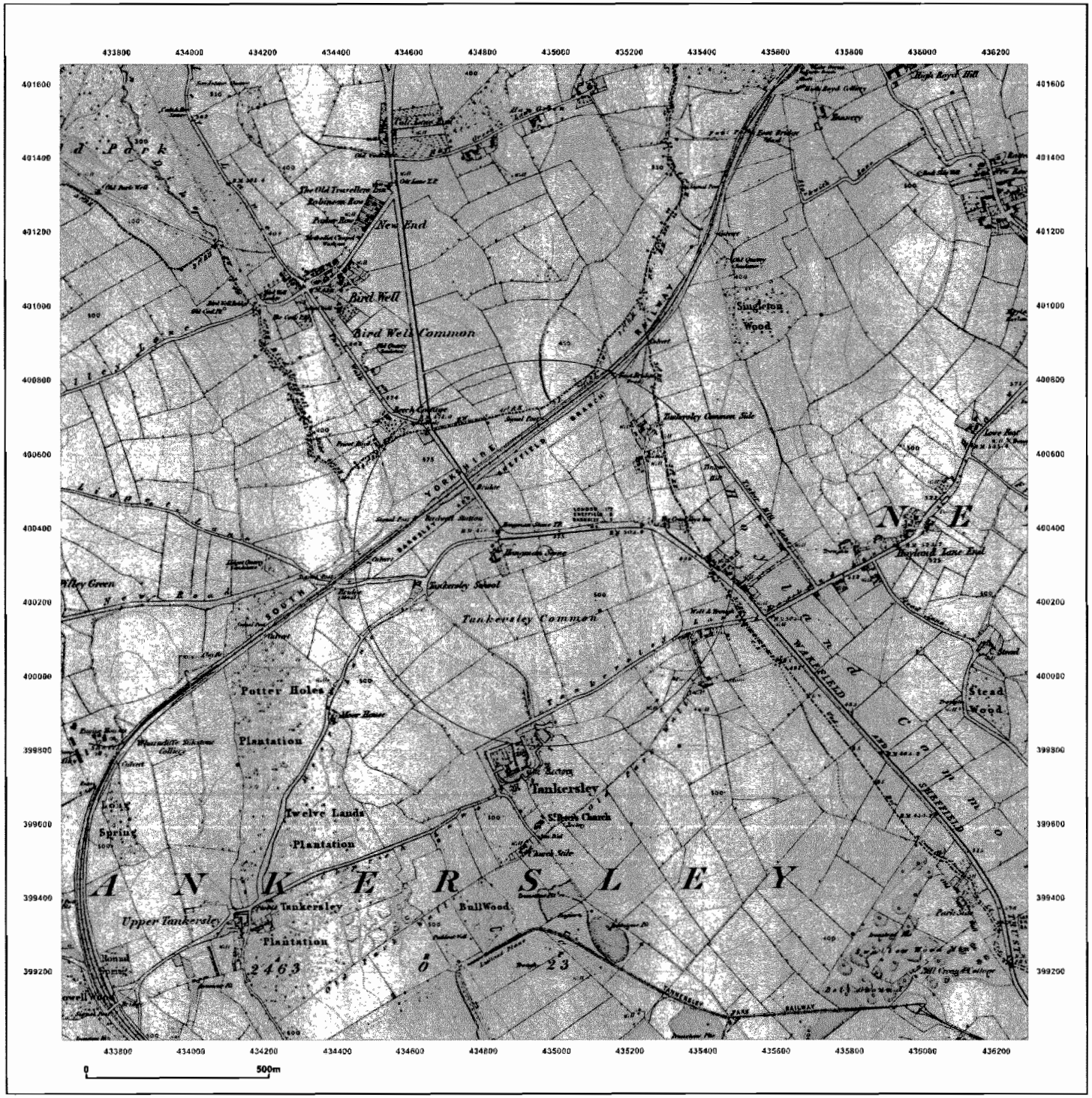
Industrial Operator Scores reflect two of the five attributes that make a site's Operational risk appraisal (Opra) profile. The Compliance Rating band reflects the number of non-compliances with permit conditions we have recorded at the site over the course of a year.
The Operator Performance band is influenced by the type of management system the operator has in place and any formal enforcement action we have taken at the site.

More information about OPRA

Compliance Rating Scores

Compliance Rating Scores is our report of the level of permit breaches we've recorded at sites during the year. We include both the number of breaches and also our assessment of the severity of these breaches, as determined by our Compliance Classification Scheme (CCS).

HISTORIC MAPS



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

Junction 36, M1 Birdwell
Barnsley,

Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1850
Scale: 1:10,560
Printed at: 1:10,560

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

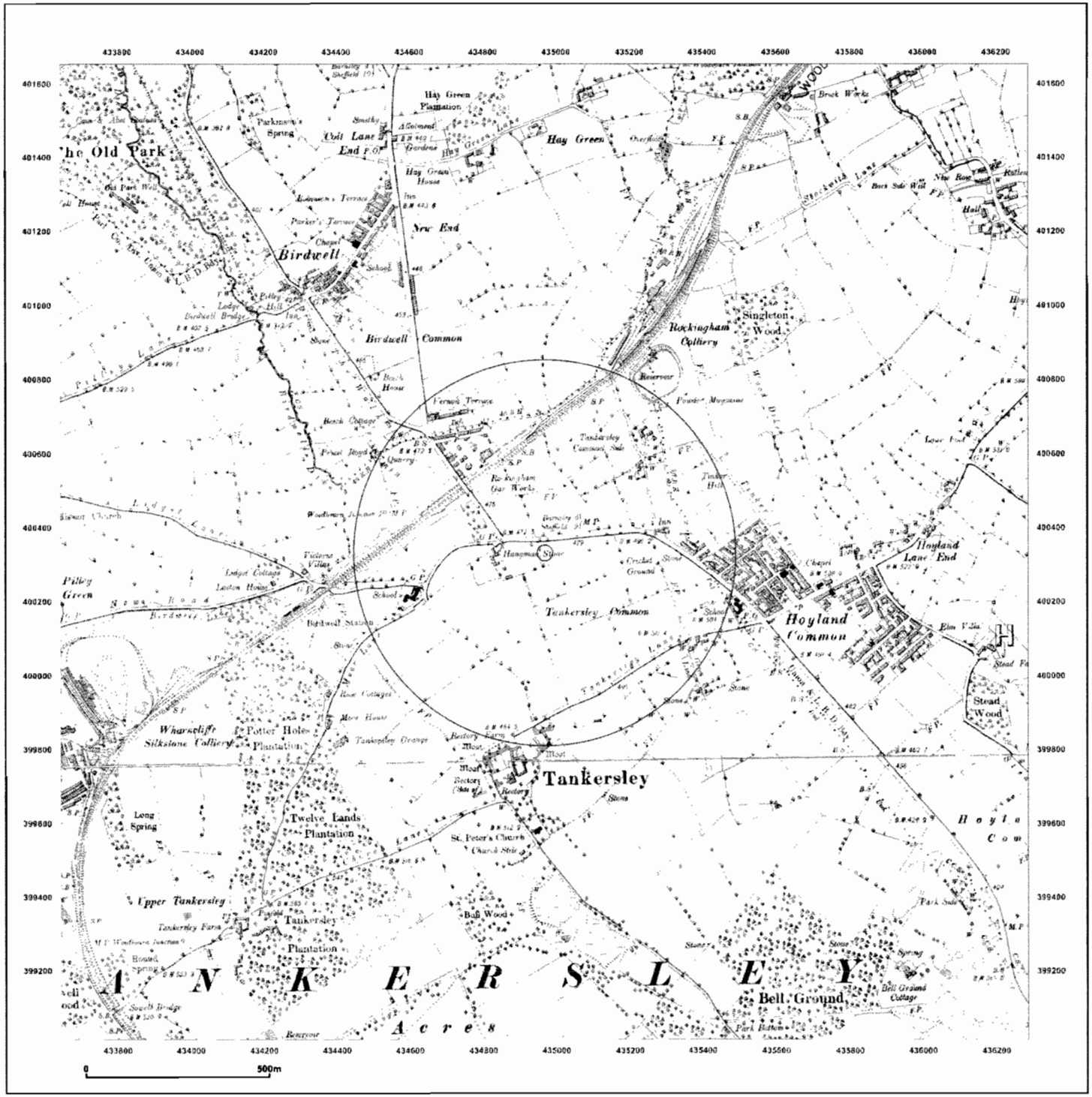
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Site Details:

Junction 36, M1 Birdwell
Barnsley,

Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1891
Scale: 1:10,560
Printed at: 1:10,560

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Edition N/A
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Levelled N/A

Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

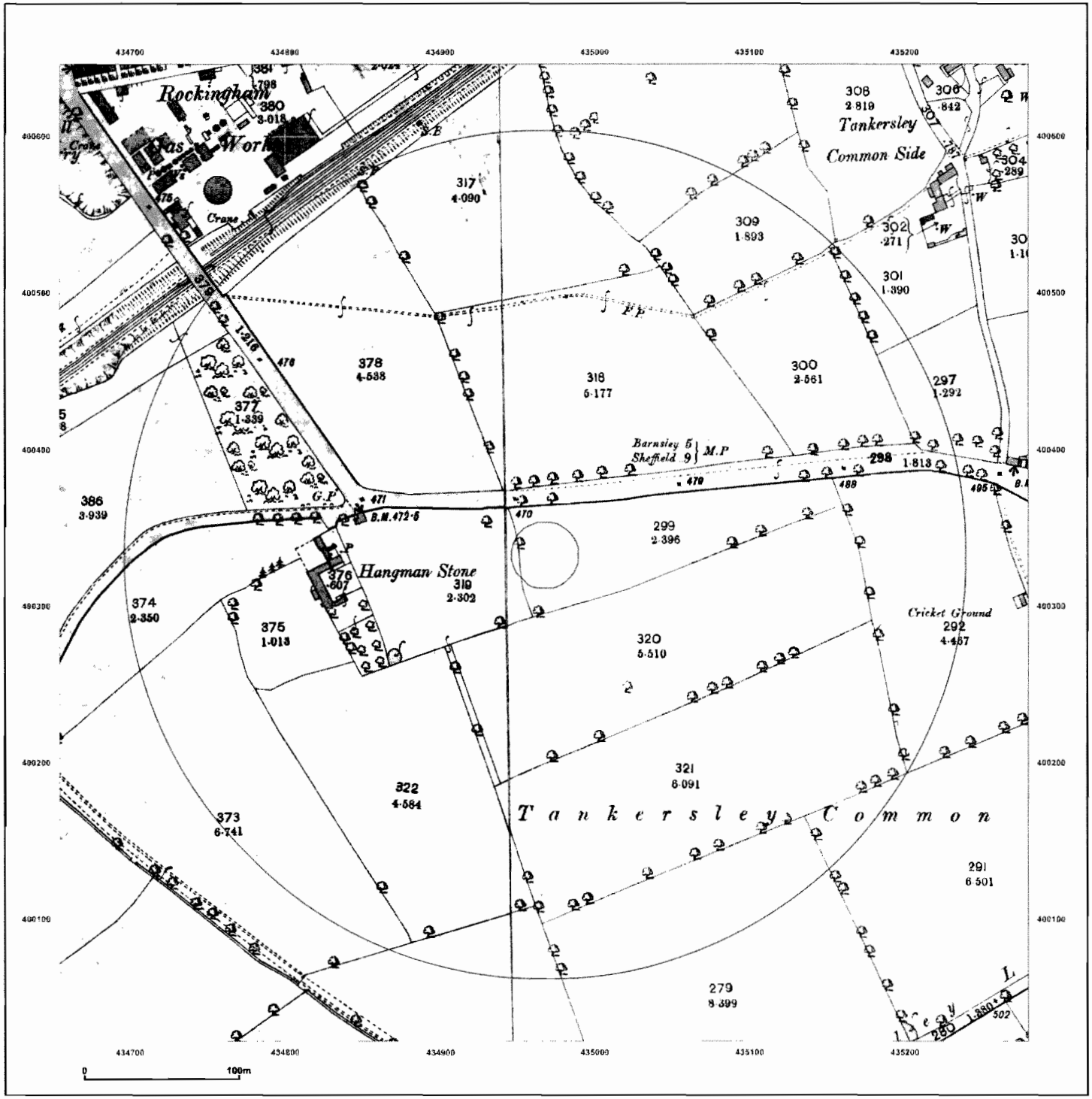
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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1893
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
Levelled N/A

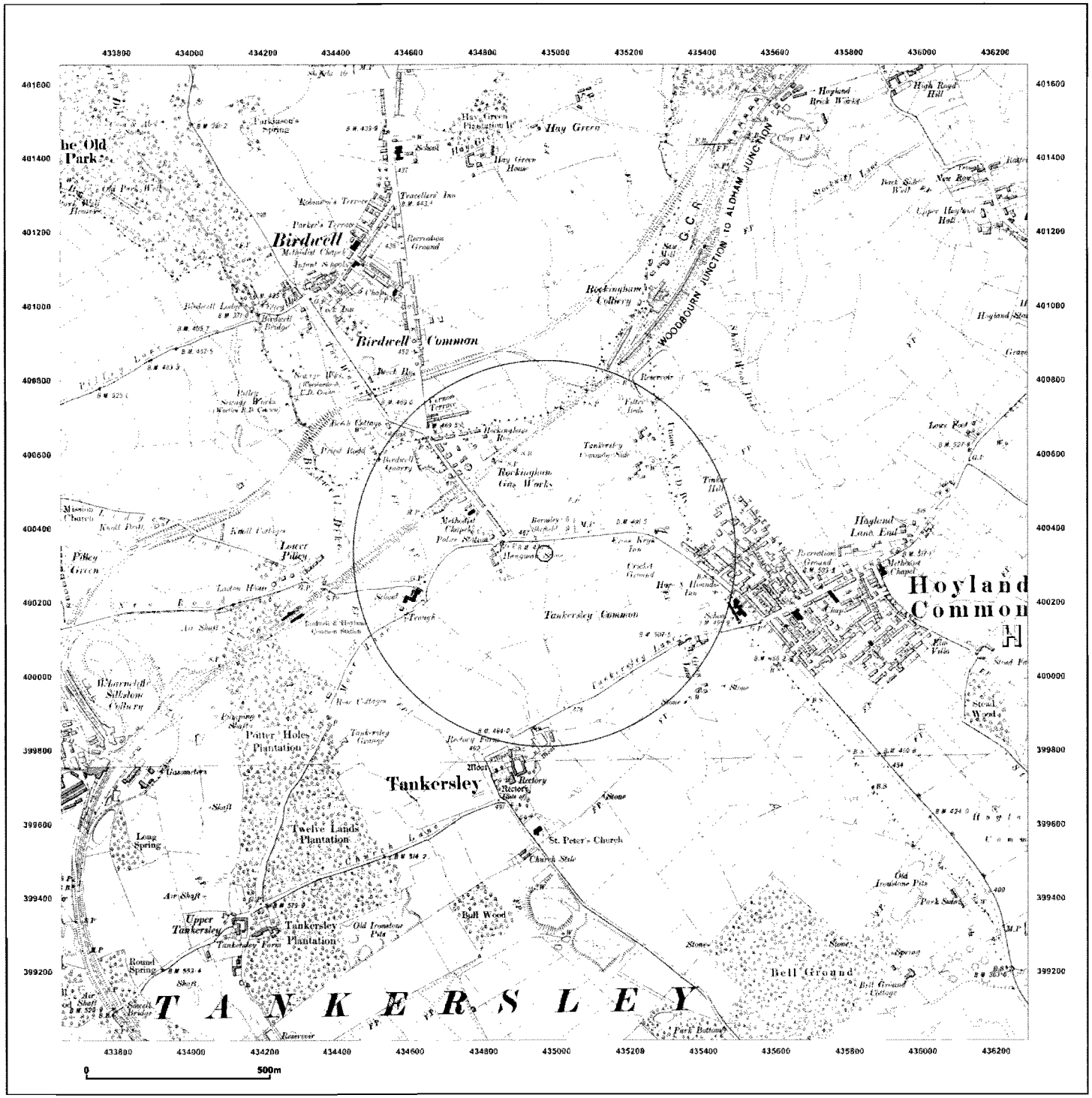
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Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1903
Scale: 1:10,560
Printed at: 1:10,560

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Revised 1903
~~Edition N/A~~
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Levelled N/A

Surveyed 1891
Revised 1903
Edition N/A
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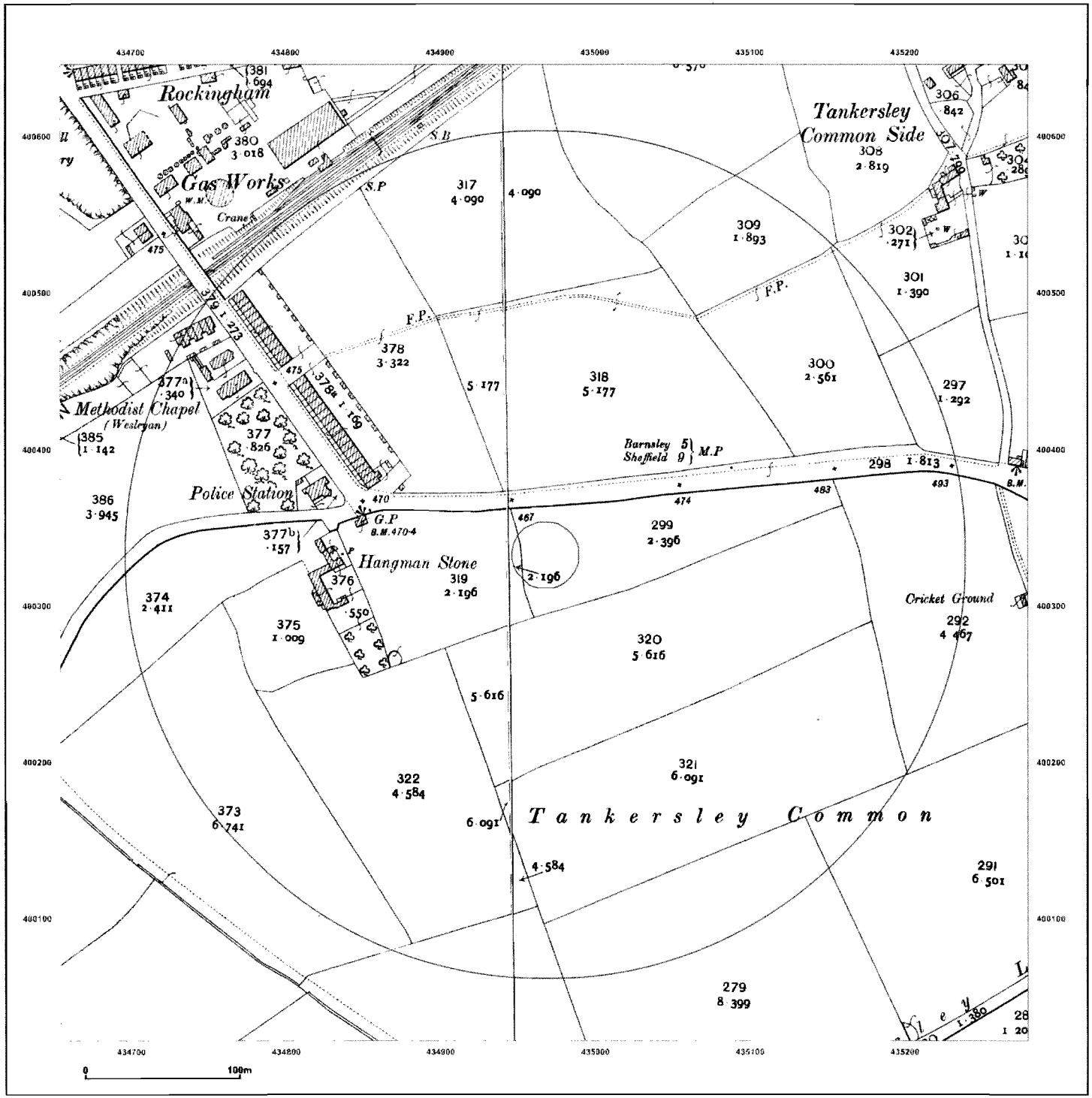
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Junction 36, M1 Birdwell
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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1905-1906
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1905
Revised 1905
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1906
Edition N/A
Copyright N/A
Levelled N/A

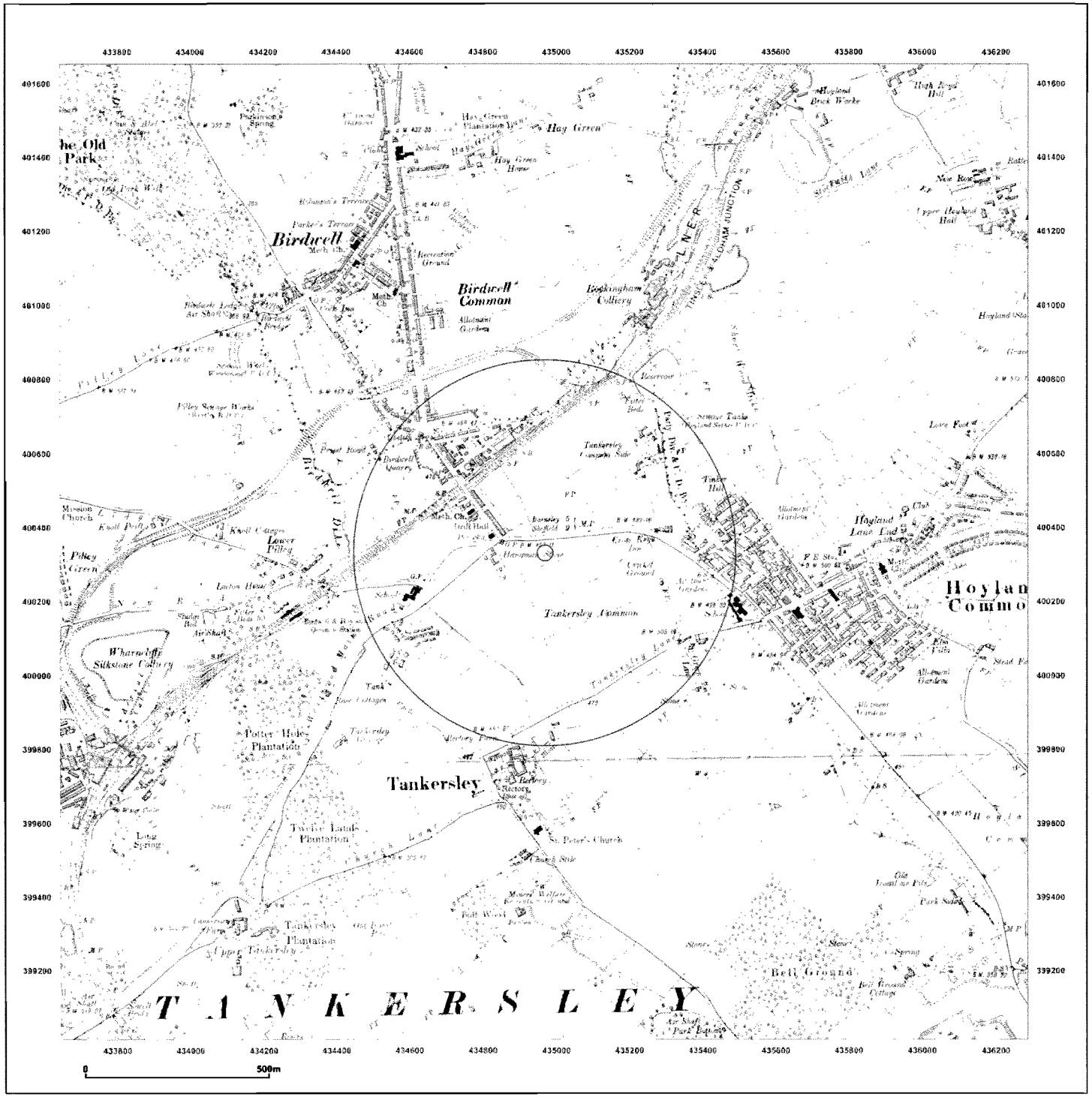
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Site Details:

Junction 36, M1 Birdwell
Barnsley,

Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1929
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1851
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Edition N/A
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Surveyed 1851
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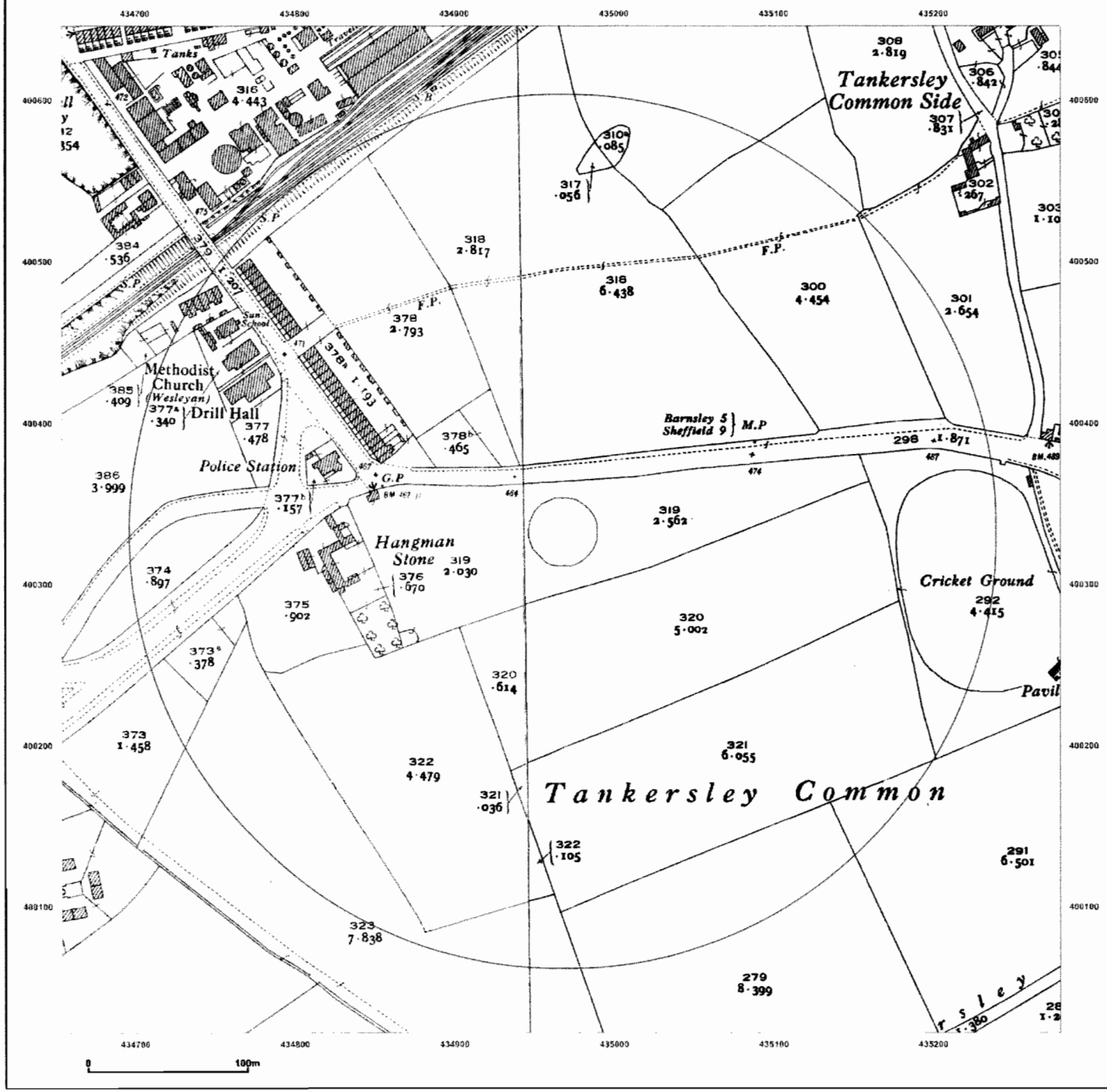
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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1931
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1931
Revised 1931
Edition N/A
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Site Details:

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Barnsley,

Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560

Surveyed 1851
Revised 1938
Edition N/A
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Surveyed 1851
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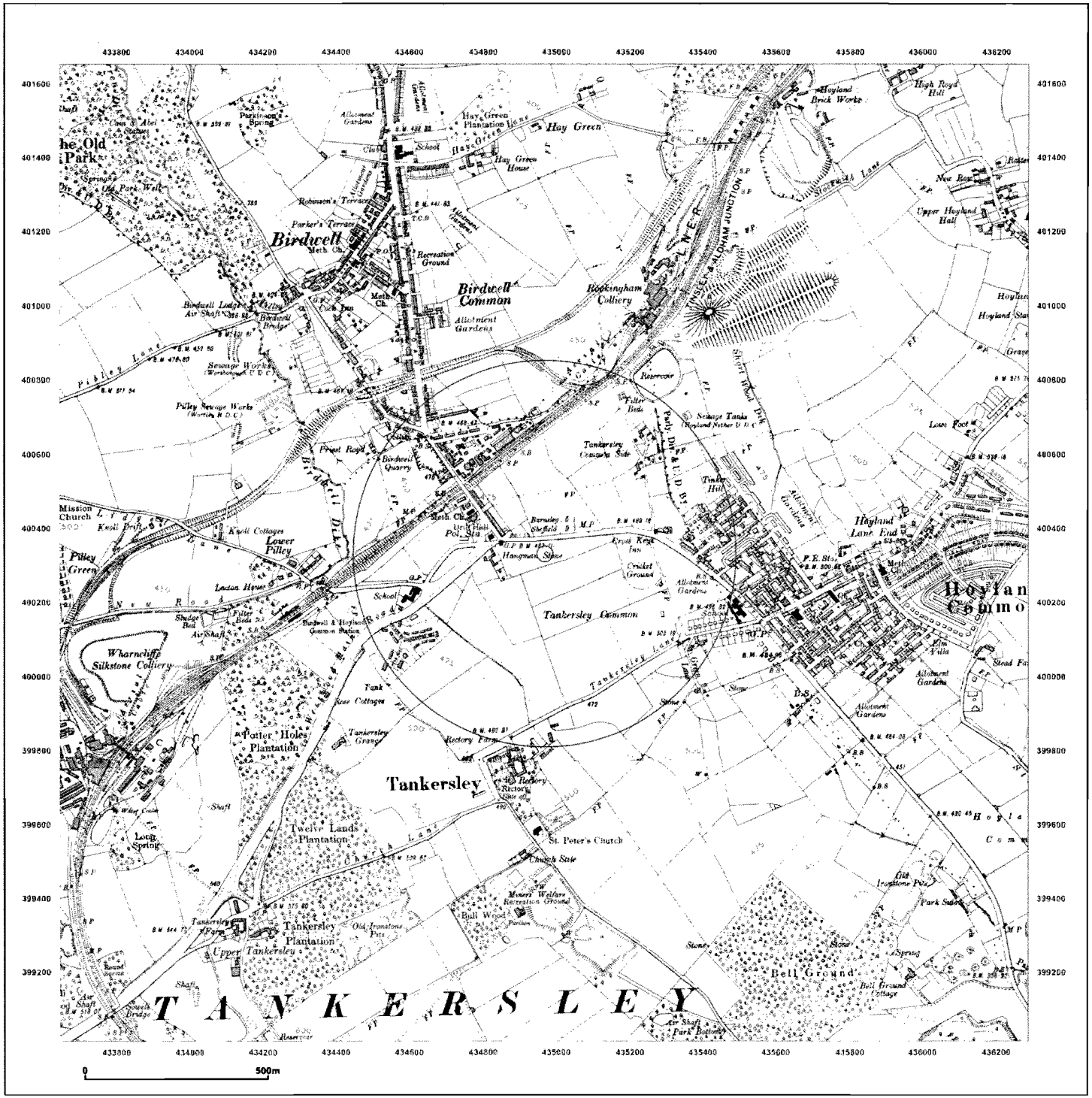
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Site Details:

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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: County Series
Map date: 1948
Scale: 1:10,560
Printed at: 1:10,560

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Revised 1948
Edition 1948
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Edition 1948
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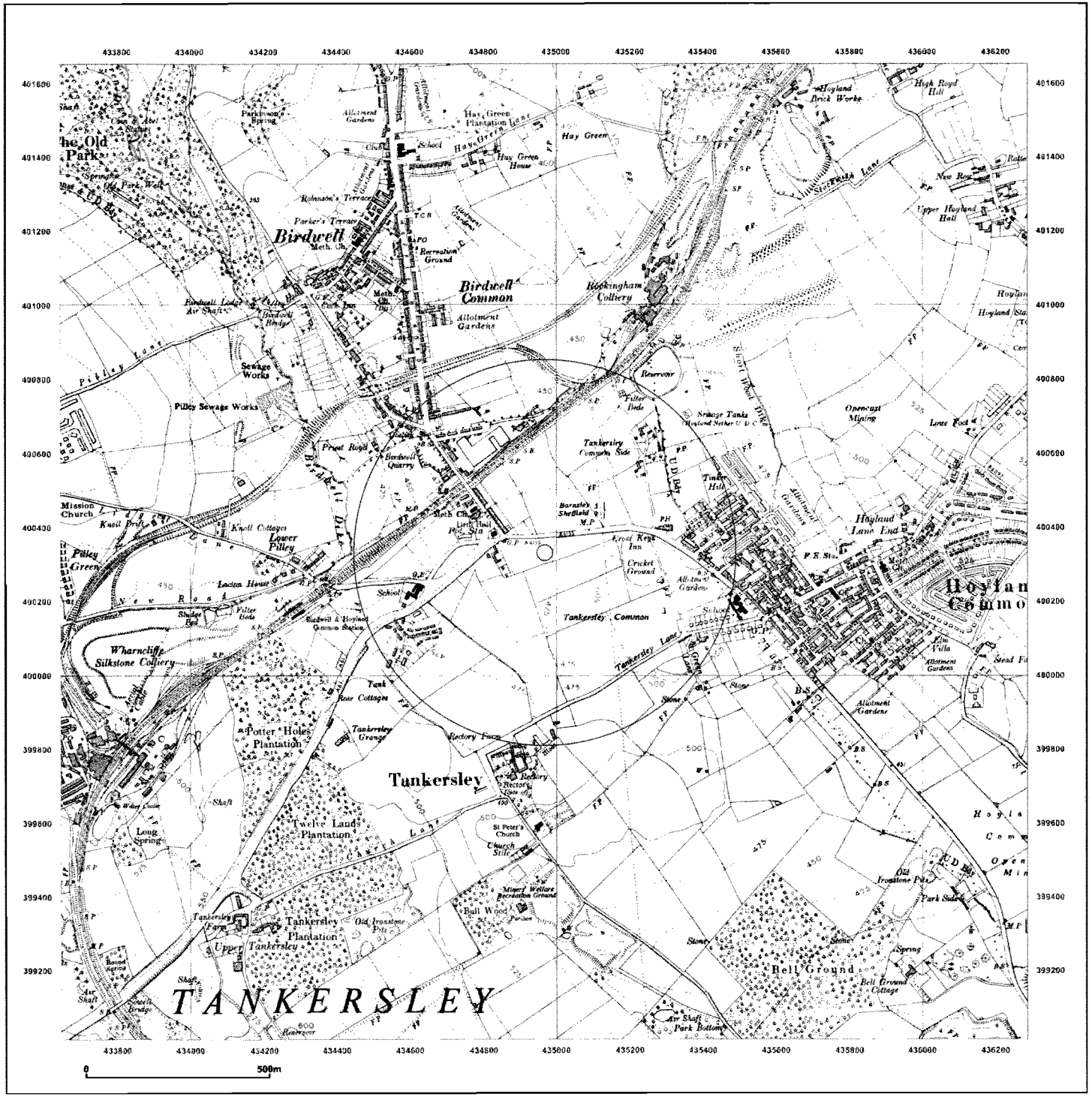
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Site Details:

Junction 36, M1 Birdwell
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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: Provisional
Map date: 1951
Scale: 1:10,560
Printed at: 1:10,560

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Revised 1951
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1951
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Revised 1951
Edition N/A
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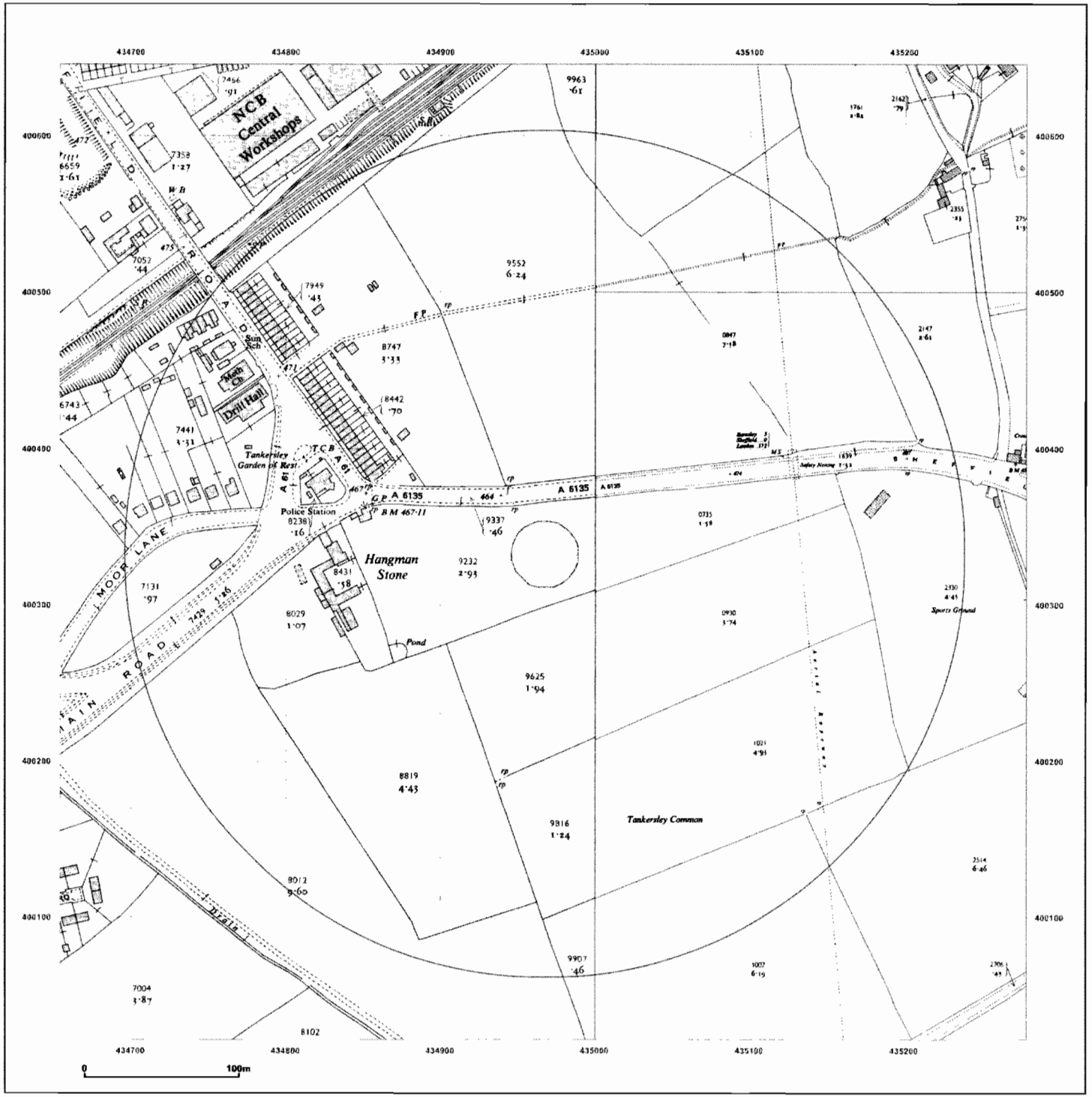
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Site Details:

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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: National Grid
Map date: 1955-1956
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1956
Revised 1956
Edition N/A
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Surveyed 1955
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Edition N/A
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Site Details:

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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: Provisional
Map date: 1965-1966
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1965
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1966
Revised 1966
Edition N/A
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Surveyed 1965
Revised 1965
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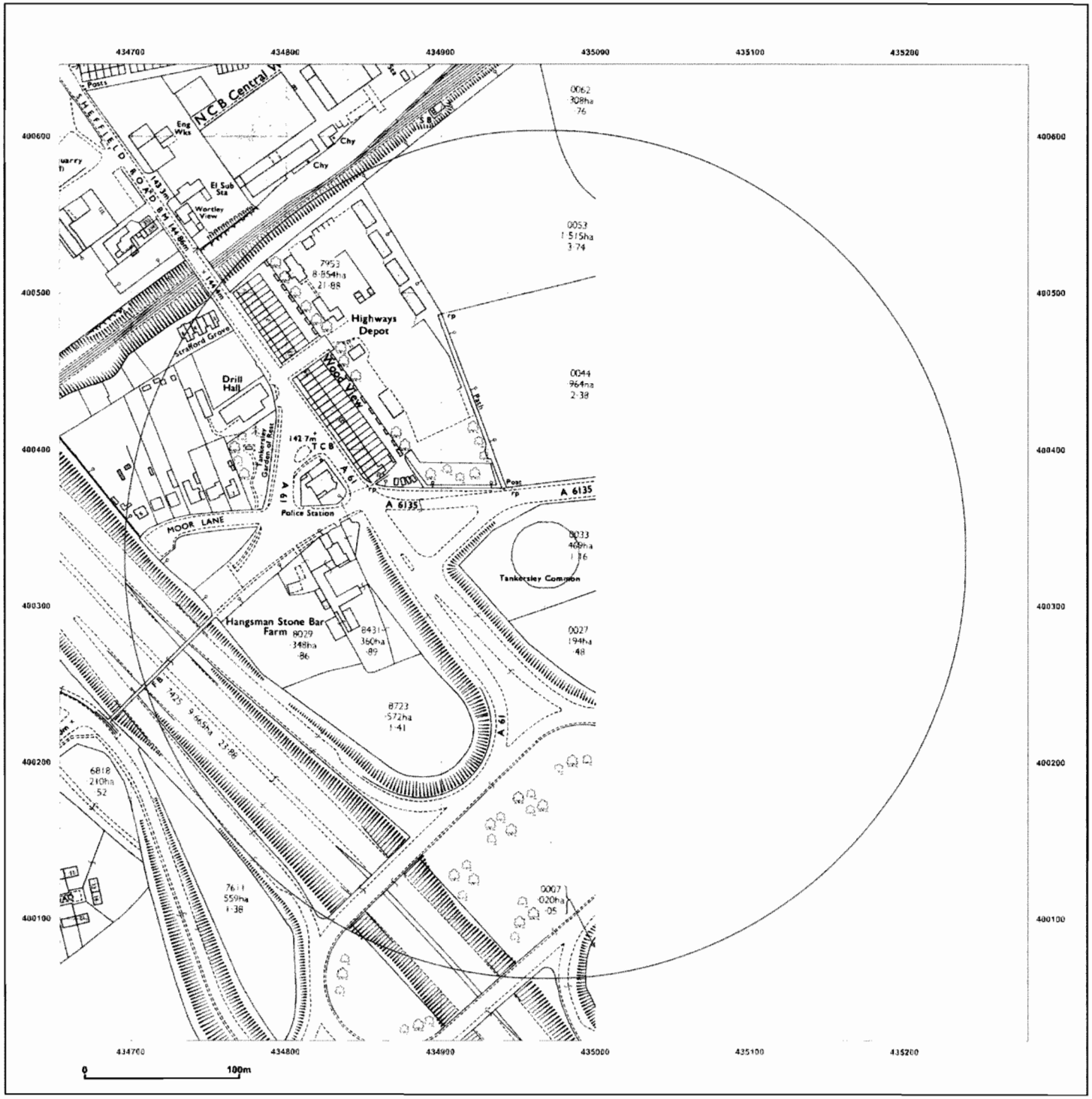
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Barnsley,

Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: National Grid
Map date: 1973
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1973
Revised 1973
Edition N/A
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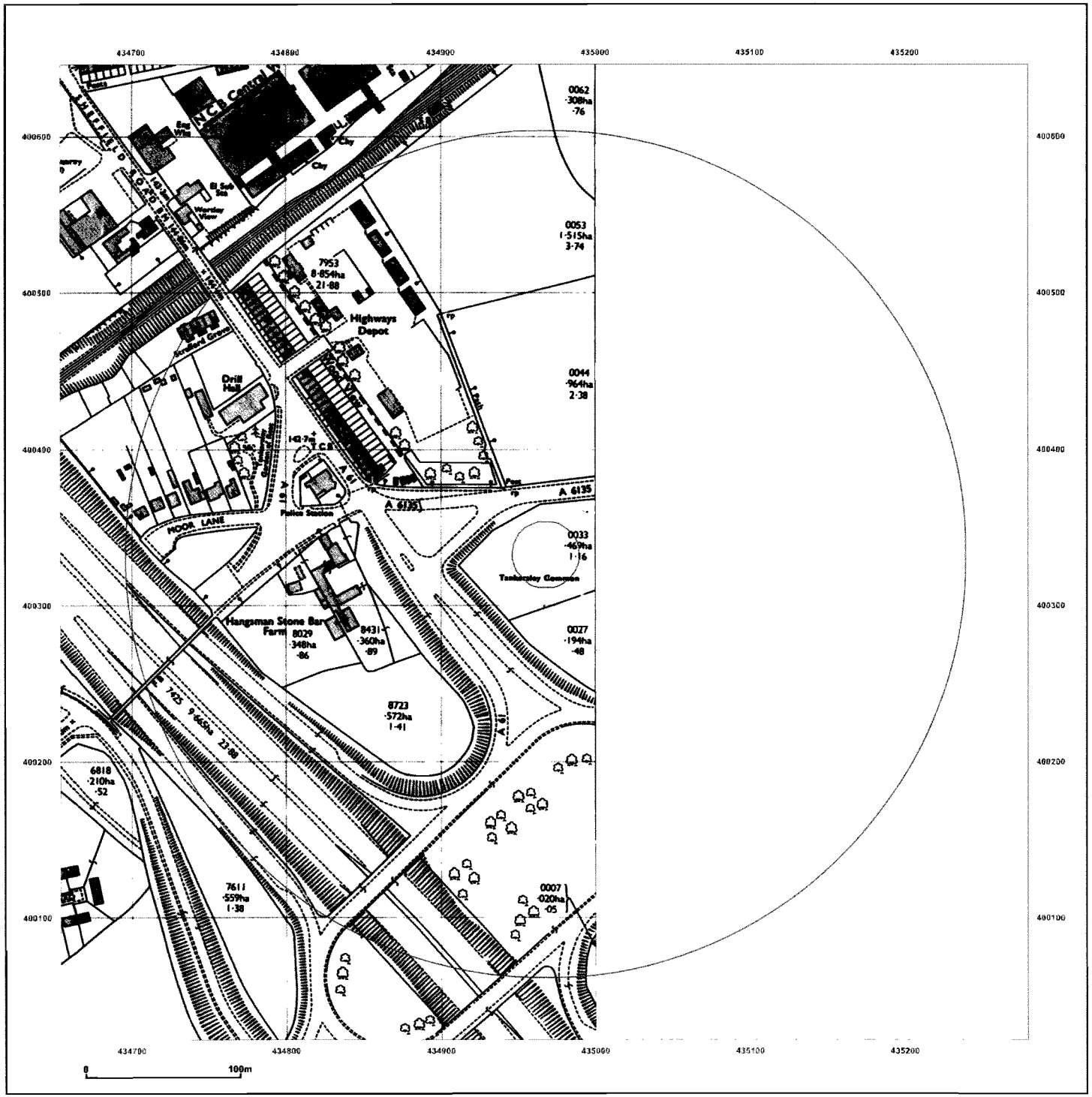
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Site Details:

Junction 36, M1 Birdwell
Barnsley,

Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: National Grid
Map date: 1974
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed N/A
Revised N/A
Edition N/A
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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: National Grid
Map date: 1977-1980
Scale: 1:10,000
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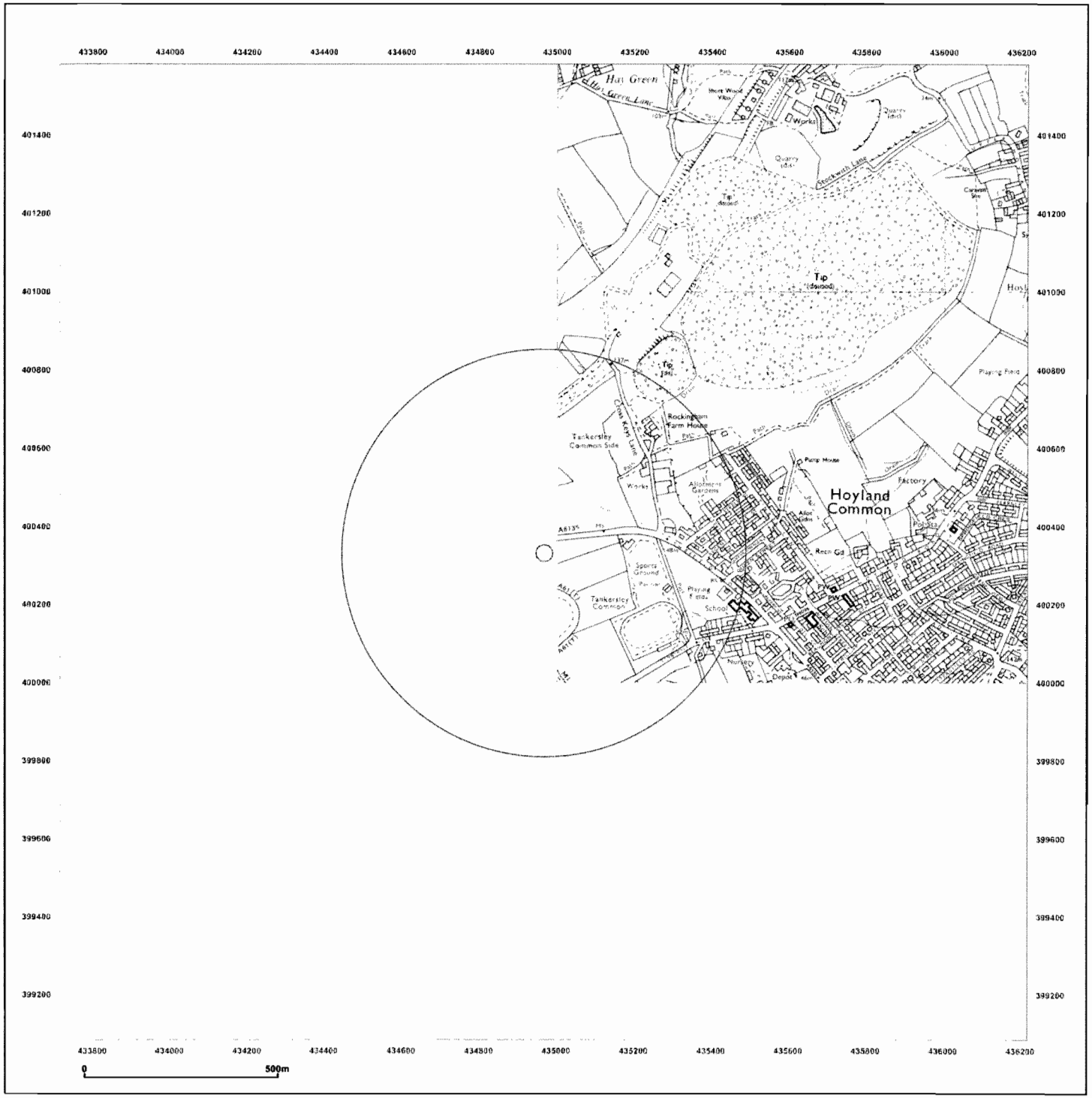
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Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: National Grid
Map date: 1987
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Surveyed 1986
Revised 1987
Edition N/A
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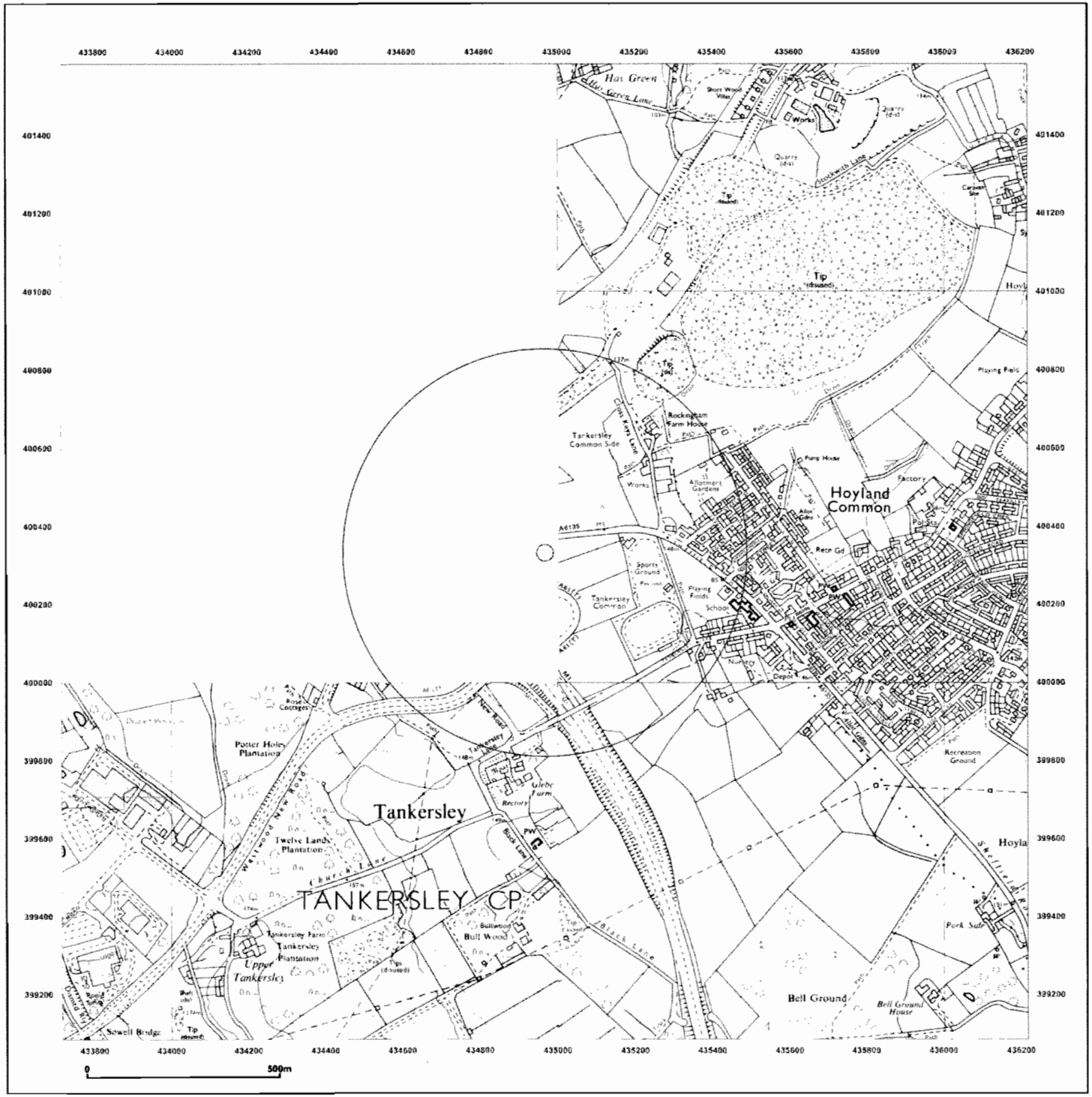
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Report Ref: GS-1026177
Grid Ref: 434967, 400334

Map Name: National Grid
Map date: 1987-1992
Scale: 1:10,000
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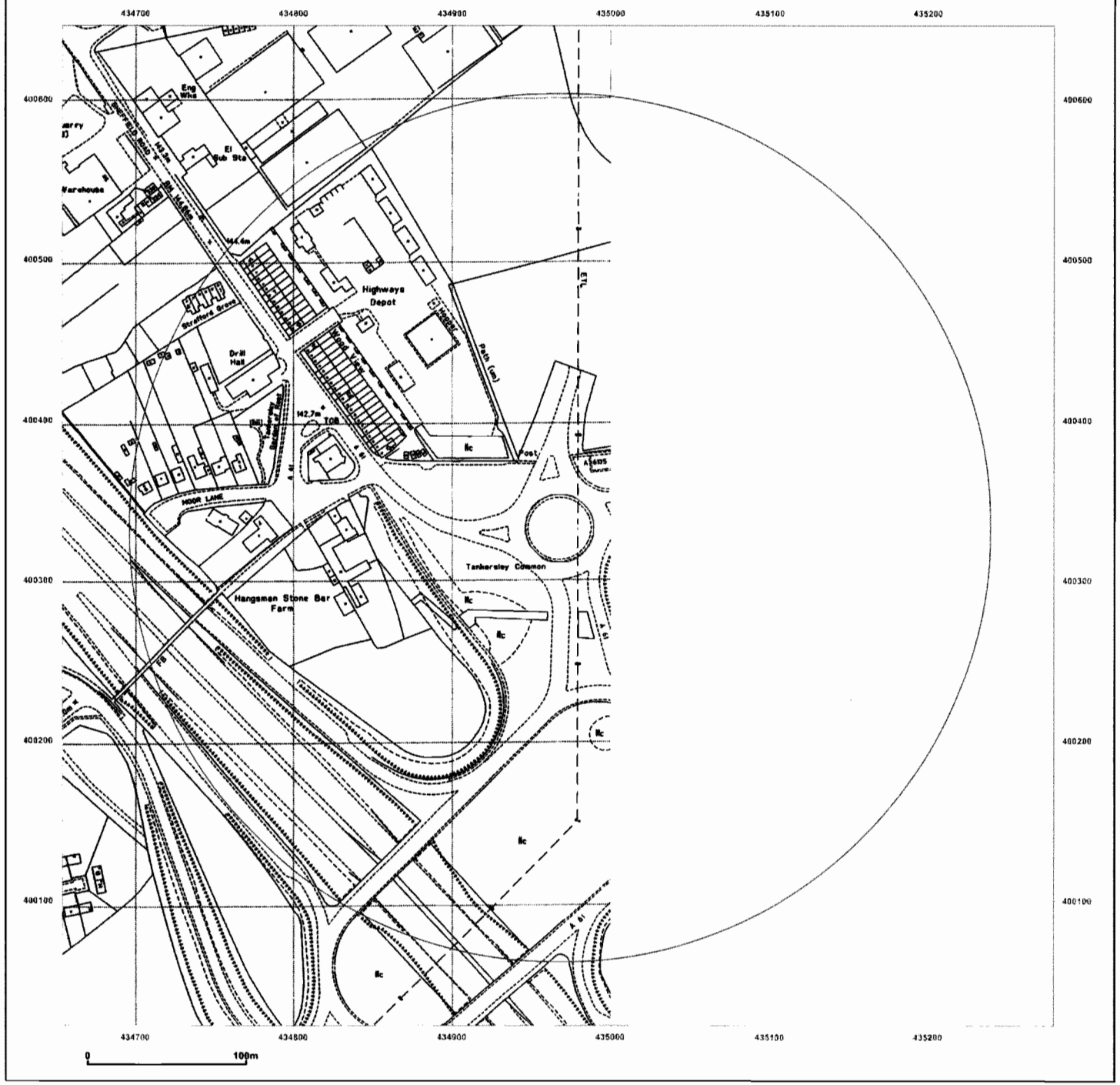
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Client Ref: 151045_2599
Report Ref: GS-1026177
Grid Ref: 434967, 400334

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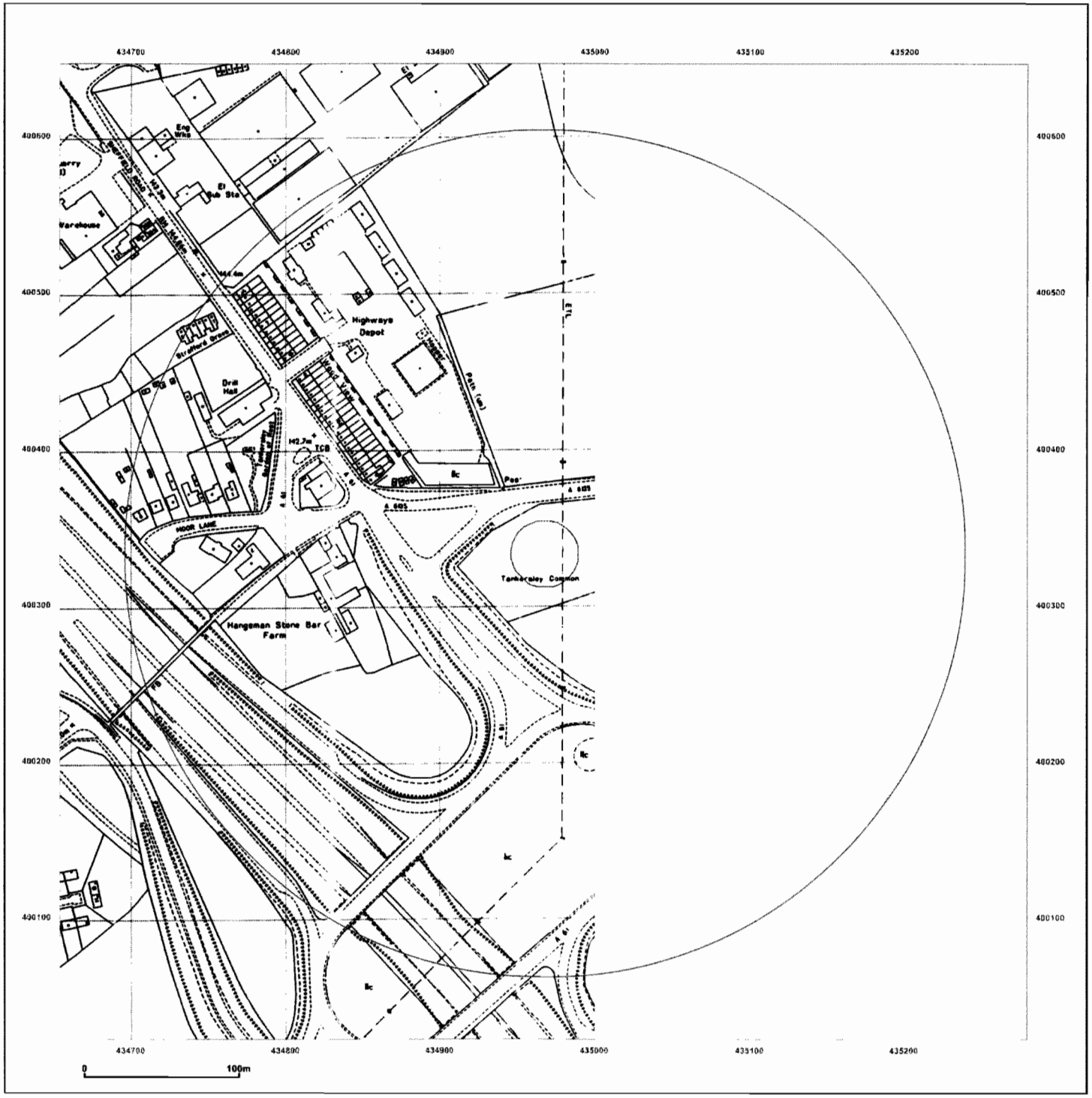
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Report Ref: GS-1026177
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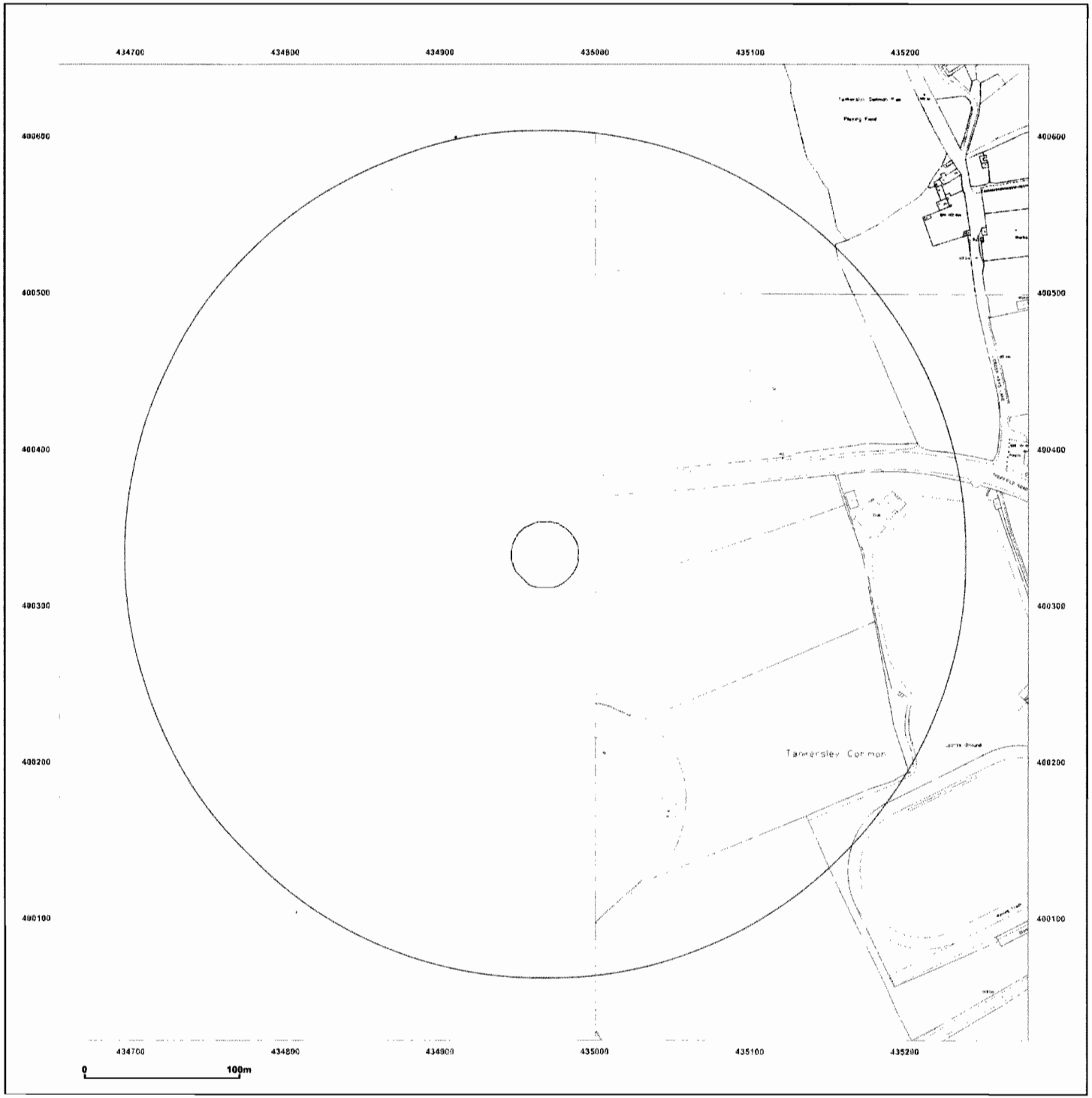
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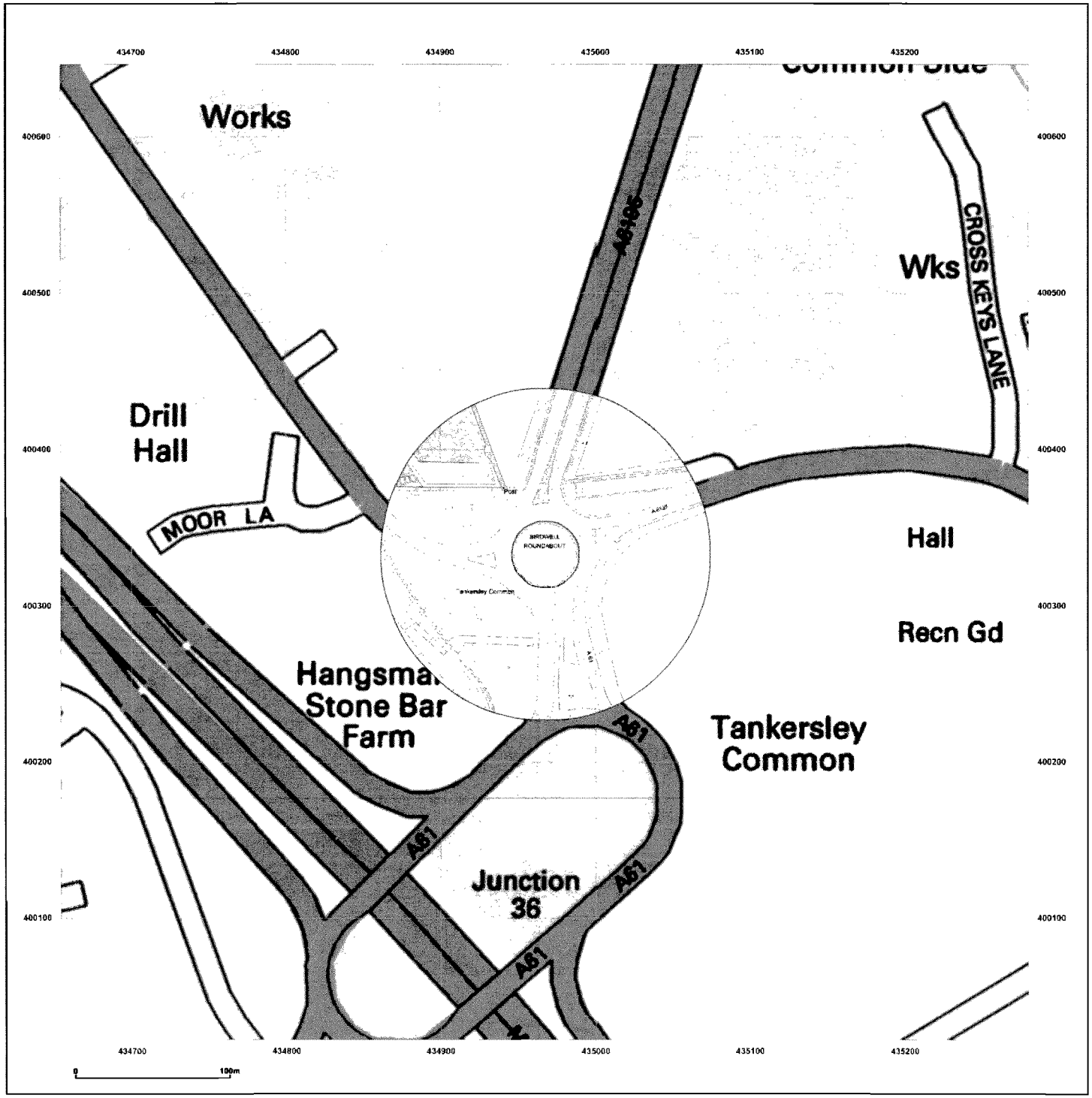
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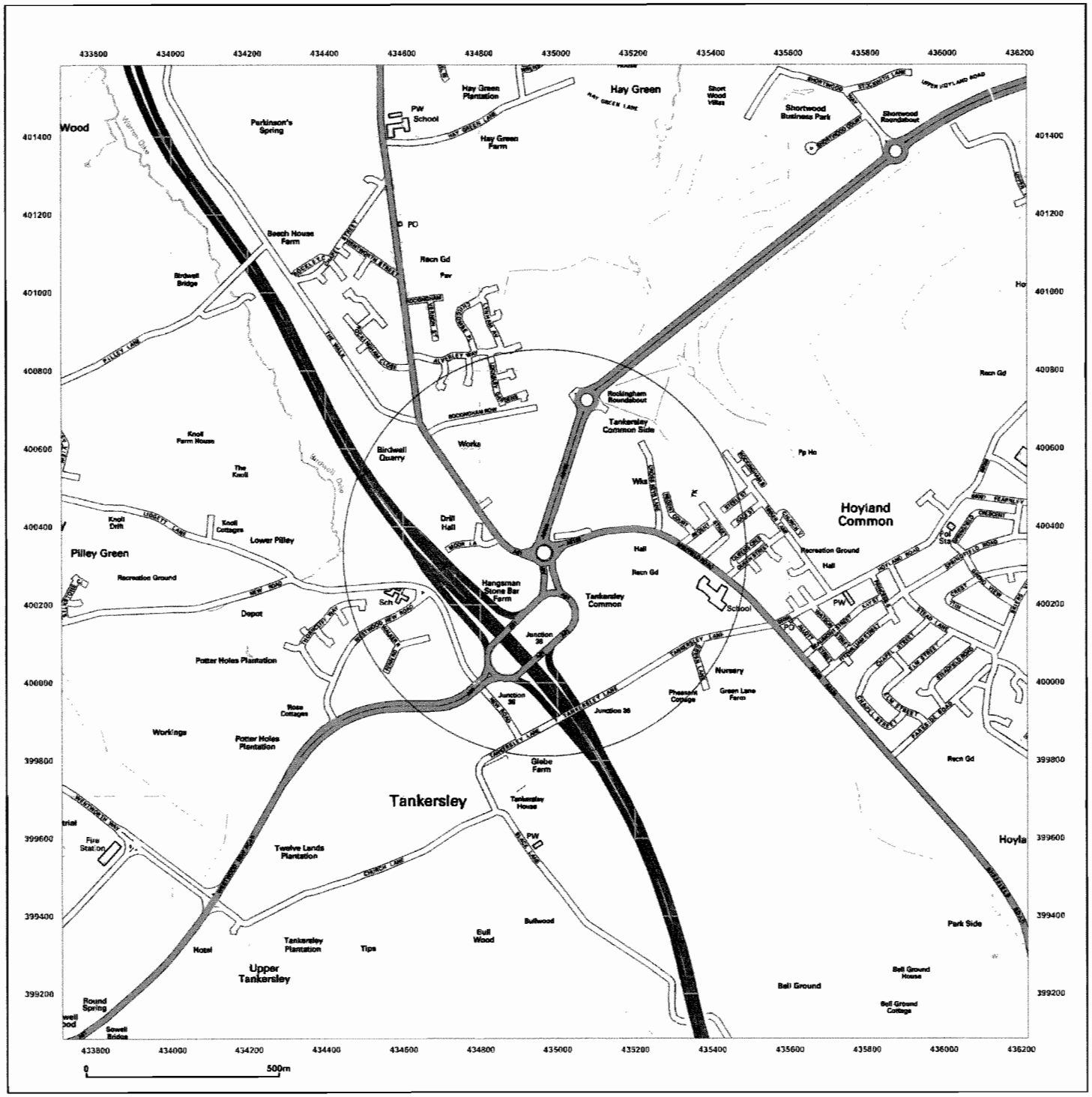
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Report Ref: GS-1026177
Grid Ref: 434967, 400334

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Map date: 2012
Scale: 1:10,000
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APPENDIX A - CONTAMINATION RISK ASSESSMENT

Appendix A

DESK STUDY ASSESSMENT OF POTENTIAL CONTAMINATION RISK

Land Use Risk Assessment

An assessment has been carried out for a number of common past land uses, indicating the severity risk rating that should be used. Where little is known about a site the higher land uses found and rating range figures should be used. Also given are the recommended chemical tests associated with a site investigation, however the exact tests will be determined on a site by site basis.

Potential Risk		Land Use	Risk Rating Range	Contamination testing					Comment
Description	SI Colour Rating			EA Screen	Leachate	TPH	PAH 16	BTEX PCBs	
Very High 5	Red	Radioactive site	5	Specialist assessment required					
		Petrol/Chemical Plant	5	x	x	x	x	x	
		Metal Works	5	x	x	x	x		Toxic metals
		Landfill Site	3 - 5	x	x				Dependent on infill
		Dye Works	3 - 5	x	x	x	x	x	
		Coke Works	4 - 5	x	x	x	x	x	
		Gas Works	4 - 5	x	x	x	x	x	
		Tannery	4 - 5	x	x				
		Petrol Station	3 - 5	x	x	x	x		
		Oil Depot	3 - 5	x	x	x	x		
High 4	Yellow	Infilled ground	3 - 5	x	x				Dependent on infill
		Heavy Industry	4	x	x		x	x	
		Soap Works	4	x	x			x	
		Power Station	4	x	x				
		Garage	4	x	x	x	x		
		Timber Yard	4	x	x				
		Highway	3 - 4	x	x	x	x		
		Abattoir	3 - 4	x	x				
		Colliery	3 - 4	x	x				
Moderate 3		Fabric Mill	3 - 5	x	x			x	5 if dye on site
		Foundry	3 - 4	x	x				
		Hospital	3 - 4	x	x				
		Food Factory	3	x	x				
		Sewage Works	3	x	x		x	x	
		Brewery	3	x	x				
		Coal Yard	3	x	x				
		Airfield	3	x	x				
		Light Industry	3	x	x				
		Colliery Spoil	2 - 3	x	x				
Low 2	Green	Offices/Commercial	2	x	x				
		Storage/Warehouse	2	x	x				
		Residential	2	x	x				
		Quarry	2	x	x				Unfilled
		Gardens/Parkland	1 - 2	x	x				
Negligible		Farm/Wood/Moors	1 - 2	x	x				

Site Contamination Risk Assessment

In assessing overall contamination risk, the following categorisation has been developed:

Term	Description
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action. Investigation required (if not already undertaken) and remediation very likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action. Investigation required (if not already undertaken) and remediation likely to be required.
Moderate Risk	It is possible that without appropriate remedial action harm could arise to a designated receptor. It is relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild. Investigation usually required (if not already undertaken) and remediation may be required.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard. It is likely that, at worst if any harm was realised any effects would be mild. Investigation may be required (if not already undertaken) but remediation is unlikely to be required.
Negligible Risk	The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor. Investigation may be required (if not already undertaken) to confirm.

APPENDIX B - CONCEPTUAL MODEL RISK MATRIX

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APPENDIX B

Risk matrix to be used when assessing risk for conceptual site model

		Severe	Medium	Mild	Minor	>12 = Very High
	Risk	4	3	2	1	12 = High
High Likilhood	4		12	8	4	8 to 9 = Moderate
Likely	3	12	9	6	3	4 to 6 = Moderate / iow
Low Likilhood	2	8	6	4	2	3 = Low
Unlikely	1	4	3	2	1	1 to 2 = Very Low

Risk	Risk Rating
Very High	5
High	4
Moderate	3
Moderate / Low	2 to 3
Low	2
Very Low	1

APPENDIX C - FURTHER REPORTING

None requested at this stage.